FINAL

ENVIRONMENTAL ASSESSMENT

ADDRESSING THE

HOMEPORTING OF THE LITTORAL COMBAT SHIP

ON THE EAST COAST OF THE UNITED STATES

JUNE 2013

Prepared by U.S. Department of the Navy

In accordance with Chief of Naval Operations Instruction 5090.1C
Pursuant to National Environmental Policy Act, Section 102(2) (C)

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Lead Agency:	U.S. Department of the Navy
Title of Proposed Action:	Homeporting of the Littoral Combat Ship (LCS) on the East Coast of the United States
Designation:	Environmental Assessment
Prepared by:	U.S. Fleet Forces Command U.S. Department of the Navy
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ABSTRACT

Under the Proposed Action, the U.S. Department of the Navy (Navy) proposes to provide facilities and functions to support the homeporting of up to 14 Littoral Combat Ships (LCSs) on the East Coast of the United States by 2020. To ensure that all potential homeporting alternatives are appropriately addressed, the Proposed Action includes homeporting up to either 14 Austal variants, 14 Lockheed Martin variants, or a combination of 14 Austal and Lockheed Martin variants. The Proposed Action also includes any new construction or improvements required for existing facilities to support the LCSs, new land-based training requirements for the LCSs, and stationing LCS crews (i.e., ship company crew, mission package crew, and on-installation support personnel) and their dependents. Aircraft systems and crews associated with the LCS (i.e., MH-60 helicopters, MQ-8B Firescouts, and associated personnel and facilities) are already established and based at Navy installations on the East Coast; therefore, they are not analyzed in this EA.

For this EA, two action alternatives are evaluated for the Proposed Action. Under Alternative 1, the Navy plans to homeport up to 14 LCSs at Naval Station (NAVSTA) Mayport and use a combination of existing military assets in the Southeast Region to provide berthing space, ship hotel services (e.g., utilities), maintenance support, fueling services, ordnance handling and storage, cargo and mission module handling and storage, support facilities, aviation asset support, and stationing for personnel and their family members. Two scenarios under Alternative 1 are considered. Scenario 1 would include homeporting up to 14 LCSs at NAVSTA Mayport, establishing the required LCS support facilities, and stationing LCS crews at NAVSTA Mayport. Scenario 2 would include homeporting up to 14 LCSs at NAVSTA Mayport, establishing one of the required facilities for LCS mission modules at Naval Submarine Base (NSB) Kings Bay, and stationing LCS crews at NAVSTA Mayport. Alternative 2 proposes to homeport up to 14 LCSs at NAVSTA Norfolk and use a combination of existing military assets in the South Hampton Roads region to meet the same requirements as Scenario 1. The homeporting of up to 14 LCSs at NAVSTA Mayport under Scenario 1 is the Preferred Alternative.

The Council on Environmental Quality regulations also requires the consideration of the No Action Alternative. The No Action Alternative does not meet the purpose of and need for the Proposed Action. It does, however, serve as a baseline against which the impacts of the Proposed Action can be evaluated. Under the No Action Alternative, the 14 LCSs would not be homeported on the East Coast of the United States.

The intent of NEPA is to help decisionmakers make well-informed decisions based on an understanding of the potential environmental consequences of an action. This EA evaluates the potential environmental consequences of the Proposed Action and alternatives, including the No Action Alternative on the following general impact topics: noise, air quality, human health and safety, coastal zone management, geological resources, biological resources, water resources, socioeconomics (including environmental justice and protection of children from environmental health risks and safety risks), utilities and infrastructure (including transportation), hazardous materials and wastes, and cultural resources. If the analysis in the EA determines the Proposed Action would not result in any significant impacts, a Finding of No Significant Impact would be prepared. If potentially significant impacts are identified that cannot be minimized to insignificant levels, an Environmental Impact Statement would be prepared or the Proposed Action would be abandoned and no action would be taken.

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U.S. FLEET FORCES
U.S. DEPARTMENT OF THE NAVY

JUNE 2013

Executive Summary

Introduction

This Environmental Assessment (EA) describes the proposal of the U.S. Department of the Navy (Navy) to provide facilities and functions to support the homeporting of up to 14 Littoral Combat Ships (LCSs) on the East Coast of the United States. The March 2011 *Report to Congress on Strategic Plan for Homeporting the Littoral Combat Ship* ("2011 Report to Congress") identifies potential LCS homeports, infrastructure requirements to support LCSs, and the "2020 disposition of LCS platforms." The 2020 disposition of LCS platforms includes the procurement of 30 LCSs through 2020; up to 14 of which are planned to be homeported on the East Coast of the United States. This EA addresses the impacts of homeporting up to 14 LCSs on the East Coast by 2020. In addition, this EA assesses related actions associated with the required crews, facilities, and mission packages for the LCS. A separate EA to assess the impacts of homeporting up to 16 LCSs on the West Coast was completed in May 2012.

Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to provide facilities and functions to support homeporting up to 14 LCSs on the East Coast of the United States. The Proposed Action is needed to achieve the required levels of operational readiness required by 10 United States Code (U.S.C.) § 5062, *United States Navy: Composition; Functions*.

Description of the Proposed Action and Alternatives

Proposed Action

Under the Proposed Action, the Navy would homeport up to 14 LCSs on the East Coast of the United States by 2020. This includes homeporting up to either 14 Austal variants, 14 Lockheed Martin variants, or a combination of the Austal and Lockheed Martin variants. It is estimated that no more than 8 LCSs would be in port at any one time.

The Proposed Action also includes any use of existing facilities and any improvements required to support the LCSs, land-based training requirements for the LCSs, storage and maintenance of the MQ-8B Firescout unmanned aerial vehicle (a mission component of the LCS), and stationing LCS crews and their dependents. Facilities to support the storage, maintenance, and test flights of Firescouts have already been established at Marine Corps Air Station (MCAS) Cherry Point. Therefore, these activities are not analyzed in this EA at MCAS Cherry Point. Minor land-based facility improvements would occur; no in-water construction projects would be required under the Proposed Action at MCAS Cherry Point.

Navy vessel transit activities, which include in-port operations, were analyzed in the Navy's Virginia Capes, Cherry Point, and Jacksonville Environmental Impact Statement (EIS) and addressed in the National Marine Fisheries Service (NMFS) Marine Mammal Protection Act and Endangered Species Act (ESA) authorizations, dated June 2009. These authorizations continue through June 2014. The Navy is currently in ESA consultation with NMFS as part of the Navy training and testing analysis (2014—2019) in the *Atlantic Fleet Training and Testing EIS* to provide continuing coverage for vessel transits and training beginning in 2014.

Homeporting Criteria for Alternatives

Operational and facility criteria were used to support a comparison of potential alternative homeport locations for the Proposed Action and are summarized as follows.

Operational criteria include the following:

- Use of existing resources and support infrastructure is required to the maximum extent practicable to reduce overall cost and avoid inefficient redundancy.
- The homeport location is required to be proximate to or collocated with the Air Wing components that would deploy on the LCS (i.e., Firescouts, MH-60 helicopters, and MH-60 detachment) to satisfy the integrated training requirements in support of the Fleet Response Plan.
- A single homeport location is required for the LCSs and associated crews to maintain crew interchangeability and standardization of all shipboard procedures.
- The LCSs should be located in a major Fleet Concentration Area to ensure the LCS is best incorporated and integrated into Fleet Strike groups and to allow for integrated training and deployment work-ups in support of the Fleet Response Plan.

Facility criteria include the following:

- Adequate pierside homeporting capabilities, including berthing space and utilities (i.e., water, sewer, electricity, solid waste management, and electronic data access).
- Adequate ordnance loading, offloading, and storage capabilities.
- An LCS Training Facility (LTF) that includes simulators and electronic classrooms.
- An LCS Support Facility (LSF) to accommodate LCS Squadron and an off-hull crew administrative area.
- A Mission Module Readiness Center (MMRC) to provide mission module maintenance, sustainment, reconfiguration, and storage.

Homeporting Alternatives Considered

Naval Station (NAVSTA) Mayport Alternative (Alternative 1)

Under the NAVSTA Mayport Alternative, the Navy proposes to provide facilities and functions to support the homeporting of the LCSs at NAVSTA Mayport and use a combination of existing military assets in the Southeast Region to provide berthing space, ship hotel services, maintenance support, drydocking facilities, fueling services, ordnance handling and storage, cargo and mission module handling and storage, support facilities, and aviation asset support. No in-water construction projects would be required.

Under the NAVSTA Mayport Alternative, the following two scenarios were considered and carried forward for further detailed analysis:

- *Scenario 1 – NAVSTA Mayport.* Scenario 1 includes homeporting up to 14 LCSs, establishing the required LCS support facilities, and stationing LCS crews at NAVSTA Mayport. This is the Preferred Alternative.
- *Scenario 2 – NAVSTA Mayport-Naval Submarine Base (NSB) Kings Bay*. Scenario 2 includes homeporting up to 14 LCSs at NAVSTA Mayport, establishing one of the required facilities for LCS, the MMRC at NSB Kings Bay, and stationing LCS crews at NAVSTA Mayport.

NAVSTA Norfolk Alternative (Alternative 2)

Under the NAVSTA Norfolk Alternative, the LCSs would be homeported at NAVSTA Norfolk, the required support facilities would be established, and crews and their family members would be stationed at NAVSTA Norfolk. The Navy proposes to use existing military assets to provide berthing space, ship hotel services, maintenance support, drydocking facilities, fueling services, ordnance handling and storage, cargo handling and storage, and stationing for personnel and their family members. New construction would be required.

Personnel Requirements

The Proposed Action includes stationing up to 21 crews and approximately 244 on-installation LCS support personnel at a Navy installation on the East Coast. This would equate to a total increase of approximately 1,700 personnel, not including family members. For purposes of this analysis, it is estimated that each of the military personnel would be accompanied by 1.12 family members. Therefore, the total number of people (Navy personnel [1,700 people] and their family members [1,904 people]) at a Navy installation is estimated to be approximately 3,600.

To support Firescouts, approximately 30 on-installation personnel would be stationed at MCAS Cherry Point. In addition, to support the MMRC facility, an additional 30 people would be required at NSB Kings Bay. If each Navy personnel is accompanied by 1.12 family members, the total number of people (Navy personnel [30 people] and their family members [34 people]) is estimated to be approximately 64 at each installation.

No Action Alternative

The No Action Alternative does not meet the purpose of and need for the Proposed Action. It does, however, serve as a baseline against which the impacts of the Proposed Action can be evaluated. Under the No Action Alternative, the Navy would not establish the facilities and functions to support the homeporting of up to 14 LCSs on the East Coast of the United States.

Summary of Potential Environmental Impacts

All potentially relevant environmental resource areas were initially considered for analysis in this EA, in compliance with the National Environmental Policy Act, Council on Environmental Quality, and Navy Guidelines in 32 Code of Federal Regulations § 775. The analyses includes noise, air quality, human health and safety, coastal zone management, geological resources, biological resources, water resources, socioeconomics (including environmental justice and environmental health and safety risks to children), utilities and infrastructure (including transportation), hazardous materials and wastes, and cultural resources.

Noise

NAVSTA Mayport Scenario. Noise from construction and demolition activities at NAVSTA Mayport would vary depending on the type and number of equipment being used, the area that the action would occur in, and the distance from the noise source. Noise generation would last only for the duration of construction and demolition activities and would occur during normal working hours (i.e., between 7:00 a.m. and 5:00 p.m.). Therefore, no significant impact on the environment from noise would be expected under the NAVSTA Mayport Alternative.

NAVSTA Mayport-NSB Kings Bay Scenario. Noise produced during renovation activities proposed at NSB Kings Bay would be similar to, and consistent with, other installation improvement actions at NSB Kings Bay. Therefore, no significant impacts on the existing noise environment would be expected.

NAVSTA Norfolk Alternative. Noise produced during construction and demolition activities proposed at NAVSTA Norfolk would be similar to the noise discussed for NAVSTA Mayport.

MCAS Cherry Point. The existing noise levels at MCAS Cherry Point are dominated by fixed-wing aircraft (which are louder than the Firescout). At distances greater than 500 feet, noise from Firescouts is not expected to be noticeable, due to the existing noise environment. Therefore, no significant impacts on the existing noise environment would be expected.

Air Quality

Federal Prevention of Significant Deterioration requirements would not apply to the Proposed Action because no increases in stationary source potential emissions would be expected, and the location of any of the alternatives are not within 6.2 miles (10 kilometers) of a Class I area.

NAVSTA Mayport Scenario. Anticipated demolition and construction emissions under the NAVSTA Mayport Scenario would represent a negligible percentage of the air emissions inventoried locally in Duval and Camden counties and within the Jacksonville-Brunswick Interstate Air Quality Control Region (AQCR). Appropriate fugitive dust-control measures would be employed during these activities to suppress emissions. Emissions associated with construction and demolition operations would be temporary in nature.

Anticipated emissions from LCS personnel commuting to and from the installation would represent a small percentage of the air emissions inventoried locally in Duval and Camden counties and within the Jacksonville-Brunswick Interstate AQCR. No significant impacts from the additional emissions from vehicles commuting to and from NAVSTA Mayport would be expected.

NAVSTA Mayport-NSB Kings Bay Scenario. Proposed activities at NSB Kings Bay would use existing facilities. No demolition or construction activities would be required; therefore, no significant air quality impacts from construction would occur. Air emissions produced during operational activities (including personnel and family member commuting activities) proposed for the NSB Kings Bay Scenario would be similar to those discussed for NAVSTA Mayport.

NAVSTA Norfolk Alternative. Air emissions produced during construction and operational activities (including personnel and family member commuting activities) proposed for the NAVSTA Norfolk Alternative would be similar to those discussed for NAVSTA Mayport.

MCAS Cherry Point. Firescout test flights would produce air emissions from fuel combustion. Due to the lack of available emissions factors specific for the Firescout engine, emissions were calculated using the U.S. Environmental Protection Agency AP-42 emissions factors for stationary internal combustion engines using diesel fuel. Because of the limited number of flights and short flight durations, no significant impacts from the additional emissions would be expected.

Human Health and Safety

NAVSTA Mayport Scenario

Contaminated Materials. The proposed project locations are not on contaminated sites. The removal of any asbestos-containing materials (ACMs), heavy metal-containing paint, and polychlorinated biphenyl-

(PCB) containing materials during renovation activities would be conducted in accordance with applicable regulations and would follow established measures and programs to ensure contaminants are handled and disposed of in compliance with Federal and state environmental laws and regulations. No significant impacts on human health and safety would be expected from contaminated materials.

Ordnance. The installation has established measures and programs for the handling and storage of ordnance to ensure it is conducted in compliance with Federal and state environmental laws and regulations. No significant impacts on human health and safety would be expected from ordnance.

Hazards of Electromagnetic Radiation to Ordnance and Explosive Safety Quantity Distance (ESQD). The installation has existing measures, programs, and Standard Operating Procedures (SOPs) that would be implemented, as appropriate, to address new sources of electromagnetic radiation. None of the proposed activities are within ESQD arcs.

Emergency Services. No impacts on emergency services would be expected. The Proposed Action would not impact the response time or efforts of the fire, force protection personnel, emergency management, or emergency medical crews on NAVSTA Mayport.

NAVSTA Mayport-NSB Kings Bay Scenario. Impacts on human health and safety at NSB Kings Bay would be similar to those described under NAVSTA Mayport, although waste materials would be generated from renovation activities and not demolition.

NAVSTA Norfolk Alternative. Impacts on human health and safety at NAVSTA Norfolk would be similar to those described under NAVSTA Mayport.

MCAS Cherry Point. Existing SOPs at MCAS Cherry Point would be employed to ensure appropriate airspace management associated with the participating aircraft, which would reduce the potential for airspace use conflicts or mishaps. Firescout operations would conform to Bird/Wildlife Aircraft Strike Hazard (BASH) guidelines and procedures. Therefore, no significant impacts on human health and safety from aircraft mishaps would be expected.

Coastal Zone Management

The Preferred Alternative is consistent with the enforceable polices of the coastal zone program of Florida. A Coastal Consistency Determination was developed and submitted to the Florida Clearinghouse for concurrence on 21 March 2013. The Florida Clearinghouse has reviewed the U.S. Navy's Negative Determination and the state concurs with the Navy's determination that the activities proposed are consistent with the enforceable policies of the Florida Coastal Management Program. The state's continued concurrence will be based on the activities' continued compliance with Florida Coastal Management Program authorities, including Federal and state monitoring to ensure said sustained compliance, and the adequate resolution of issues identified during this and subsequent reviews. The state's final concurrence of the project's consistency with the Florida Coastal Management Program will be determined during the environmental permitting process, in accordance with Section 373.428, *Florida Statutes*, and applicable regulations at 15 CFR. 930. The Proposed Action activities at MCAS Cherry Point would have no effect on coastal resources or uses for the State of North Carolina.

Geological Resources

NAVSTA Mayport Scenario. Impacts on geological resources would occur from soil compaction, erosion, and sedimentation from implementing the NAVSTA Mayport Scenario. Most of the soils have been previously disturbed. Soil erosion and sediment production would be minimized during

construction by following the installation's Erosion-and-Sediment-Control Plan, a Storm Water Pollution Prevention Plan, and complying with regulations in Section 438 of the Energy Independence and Security Act. Based on the nature of these impacts, no significant impacts on geological resources would be expected under the NAVSTA Mayport Scenario.

NAVSTA Mayport-NSB Kings Bay Scenario. No ground disturbance is proposed at NSB Kings Bay. Therefore, no impacts on geological resources would be expected under the NSB Kings Bay Scenario.

NAVSTA Norfolk Alternative. Impacts on geological resources would be limited to the areas where ground disturbance would occur on NAVSTA Norfolk, which includes the area that the support facilities are proposed for construction to the north of Building Z-309 and to the south of Morris Street. Impacts would be similar to those described for NAVSTA Mayport.

MCAS Cherry Point. The Firescout component does not entail any ground disturbance or building renovation at MCAS Cherry Point. Therefore, no impacts on geological resources would be expected.

Biological Resources

NAVSTA Mayport Scenario

Vegetation. Removed vegetation would be expected to regenerate or be replanted once construction and demolition activities have ceased. No significant impacts on vegetation would be expected from the temporary disturbances during construction, demolition, and infrastructure improvement activities.

Wildlife. No significant impacts on nearby terrestrial wildlife (e.g., birds, mammals, reptiles, and amphibians) would be expected under the NAVSTA Mayport Scenario from noise disturbances created by construction and demolition activities or the operation of the LCS. The increased noise levels would be expected to affect only individual animals within close proximity to the noise sources.

Protected and Sensitive Species. The Navy would comply with applicable Federal laws and regulations regarding the management of rare, threatened, endangered, or otherwise protected species. Protected and sensitive terrestrial species near NAVSTA Mayport would likely be habituated to the high noise levels associated with the construction and demolition activities. Therefore, no significant impacts on terrestrial protected and sensitive species or their habitats would be expected. Pursuant to the ESA, no effects on federally listed threatened or endangered terrestrial species would be expected from the Proposed Action.

Migratory birds in the area (including the piping plover, bald eagle, and wood stork) would be expected to be habituated to noise disturbances associated with construction because of the generally high noise environment on the installation. Therefore, no significant impacts on migratory birds would be expected.

NAVSTA Mayport-NSB Kings Bay Scenario. There are no ground disturbing activities proposed at NSB Kings Bay, therefore; no significant impacts on vegetation, wildlife, and protected and sensitive species would be expected under the NSB Kings Bay Scenario.

NAVSTA Norfolk Alternative. Impacts from the Proposed Action at NAVSTA Norfolk would be similar to those described for NAVSTA Mayport.

MCAS Cherry Point

Vegetation. No impacts on vegetation would be expected from the storage and test flights of Firescouts because no ground-disturbing activities would occur.

Wildlife. No significant impacts on terrestrial wildlife would occur and no loss of habitat would result from the storage and test flights of Firescouts. Noise generated from the Firescouts during test flights would likely be less than the noise generated by operations of fixed-winged aircraft that are currently at the airfield. The test flights of Firescouts would also be subject to MCAS Cherry Point's BASH program that minimizes the potential for aircraft strikes with bird/wildlife hazards through established SOPs.

Protected and Sensitive Species. Several federally listed terrestrial protected and sensitive species occur in the vicinity of MCAS Cherry Point; however, the storage and test flights of the Firescout would have a negligible impact on protected and sensitive species. Impacts at MCAS Cherry Point would be similar to those described under the NAVSTA Mayport Scenario. Wildlife near MCAS Cherry Point would likely be habituated to the high noise levels associated with the storage and test flights of the Firescouts. The Navy would comply with all applicable Federal laws and regulations regarding the management of rare, threatened, endangered, or otherwise protected species. Therefore, no significant impacts on terrestrial protected and sensitive species or their habitats would be expected.

Migratory Birds. No significant effects on a population of a migratory bird species would be expected from the Firescout test flights since they would represent a tiny fraction of the total aircraft operations on the installation and would only be for short durations. The Navy would follow procedures outlined in the *MCAS Cherry Point Integrated Natural Resource Management Plan* and adhere to the BASH program to prevent impacts on special status species and migratory birds.

Water Resources

NAVSTA Mayport Scenario

Groundwater. Proper housekeeping, maintenance of equipment, and containment of fuels and other potentially hazardous materials would be conducted to minimize the potential for a release of fluids into groundwater. In the event of a spill, procedures outlined in the *Oil Spill Prevention Control and Countermeasure Plan* for NAVSTA Mayport would be followed to contain and clean up a spill. No significant impacts on groundwater would be expected.

Surface Water. An Environmental Resource Permit must be obtained from the St. Johns River Water Management District. This ensures that water quality is not degraded, and that wetlands and other surface waters continue to provide a productive habitat for fish and wildlife. No significant impacts on surface water would be expected.

No impacts on water resources from ballast water discharge would be expected, as the Navy has established SOPs to prevent the transfer and introduction of pathogens that could impact the local ecosystem. Wastewater from the LCSs would not be discharged into the area surface waters.

Wetlands. No wetlands occur within or immediately adjacent to the project boundaries. No significant impacts on wetlands would be expected.

Floodplains. The project sites at NAVSTA Mayport are outside of the 100-year floodplain, therefore no impacts on wetlands would be expected.

NAVSTA Mayport-NSB Kings Bay Scenario. Only minor interior renovations would occur at NSB King Bay; therefore, no impacts on water resources would be expected.

NAVSTA Norfolk Alternative. Impacts on groundwater, surface water, wetlands, and floodplains at NAVSTA Norfolk for proposed construction activities would be similar to those described under the NAVSTA Mayport Scenario.

MCAS Cherry Point. In the event of a spill from Firescouts, procedures outlined in the *Oil Spill Prevention Control and Countermeasure Plan* for MCAS Cherry Point would be followed to contain and clean up the spill. No significant impacts on groundwater or surface water would be expected. Since only minor interior renovations would occur, no impacts on wetlands or floodplains would be expected.

Socioeconomics and Environmental Justice

NAVSTA Mayport Scenario

Socioeconomics. For purposes of this analysis, it is estimated that approximately 3,600 people would move to the Jacksonville Metropolitan Statistical Area. This would represent an increase of approximately 0.27 percent in the total population of the Jacksonville Metropolitan Statistical Area. It is assumed that all of the personnel and their family members would obtain housing off-installation in the Jacksonville area. Based on 2010 data, the demand for additional housing units in the Jacksonville area would represent 2.3 percent of the vacant housing units. No significant impacts on the housing market in the Jacksonville area would be expected.

Employment Characteristics. Construction and demolition workers would likely consist of local residents. The effects from construction and demolition activities would be temporary and not significant. The additional personnel would represent an approximate 0.25 percent increase in the current workforce. Employment of spouses and children and the increase in payroll taxes would stimulate the local economy under NAVSTA Mayport Scenario; however, these effects would not be significant.

Schools. The maximum number of children assumed to move to the Jacksonville area as part of the LCS homeporting would represent approximately 1.5 percent of the current public school enrollment for the Duval County School System. No significant impacts on schools in the Jacksonville area would be expected.

Environmental Justice and Protection of Children. The Jacksonville Metropolitan Statistical Area contains a lower percentage of families living below the poverty level in comparison to the State of Florida. The proposed construction activities would occur entirely at NAVSTA Mayport. Therefore, the NAVSTA Mayport Scenario would not disproportionately impact minority or low-income populations in off-installation areas. Similarly, there are no environmental health and safety risks identified that would disproportionately affect children. Therefore, no significant impact on environmental justice would be expected.

NAVSTA Mayport-NSB Kings Bay Scenario

Impacts at NAVSTA Mayport would be the same as discussed in the previous section under the NAVSTA Mayport Scenario. The following paragraphs discuss the impacts at NSB Kings Bay.

Socioeconomics. Personnel moving to the St. Marys Micropolitan Statistical Area would represent an increase of approximately 0.1 percent in the total population. As a result, no significant impacts on demographics would be expected. The demand for additional housing units in the St. Marys area would represent 1.0 percent of all vacant housing units in the St. Marys Micropolitan Statistical Area according to 2010 data. No significant impacts on the housing market in the St. Marys area would be expected.

Employment Characteristics. The total workforce in the St. Marys Micropolitan Statistical Area is approximately 25,473 people. The additional personnel would represent an approximate 0.1 percent increase in the current workforce. Employment of the spouses and children of these personnel and the increase in payroll taxes would stimulate the local economies; however, these effects would not be significant.

Schools. The maximum number of school-aged children assumed to move to the St. Marys Micropolitan Statistical Area as part of the LCS homeporting would represent approximately 0.36 percent of the current public school enrollment for the Camden County School System.

Environmental Justice and Protection of Children. The activities at NSB Kings Bay would occur entirely on the installation and would not extend into the residential areas. Therefore, the NSB Kings Bay Scenario would not disproportionately impact minority or low-income populations in off-installation areas. Similarly, there are no environmental health and safety risks identified that would disproportionately affect populations of children. Therefore, no significant impacts on environmental justice would be expected under the NSB Kings Bay Scenario.

NAVSTA Norfolk Alternative

Socioeconomics. The total number of people that would relocate to the Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area as part of the NAVSTA Norfolk Alternative would represent an increase of approximately 0.22 percent in the total population. No significant impacts on demographics would be expected.

The demand for additional housing units would represent 2.9 percent of the vacant housing units in the Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area. According to 2010 data, 8.4 percent of the housing units are vacant; therefore, a 2.9 percent increase in demand would not cause a significant impact on available housing units.

Employment Characteristics. Construction workers would likely consist of local residents. As of 2010, approximately 7.7 percent of the workforce of the Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area was employed in the construction industry. No significant impacts from construction activities would be expected. The additional LCS personnel would represent a 0.18 percent increase in the current workforce in the Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area. Employment of spouses and children and the increase in payroll taxes would stimulate the local economy; however, these impacts would not be significant.

Schools. Under the NAVSTA Norfolk Alternative, the additional school age children would be 1.5 percent of the current public school enrollment for the Norfolk-Portsmouth-Chesapeake-Virginia Beach region. No significant impacts on schools in the Norfolk-Portsmouth-Chesapeake-Virginia Beach region would be expected.

Environmental Justice and Protection of Children. The Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area contains a higher minority population in comparison to the Commonwealth of Virginia. The Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area has a slightly higher percentage of families living below the poverty level in comparison to the Commonwealth of Virginia. This alternative would not disproportionately impact minority or low-income populations in off-installation areas. Similarly, there are no environmental health and safety risks identified that would disproportionately affect populations of children. Therefore, no significant impact on environmental justice would be expected under the NAVSTA Norfolk Alternative.

MCAS Cherry Point

Socioeconomics. The total number of people that would relocate to the New Bern Micropolitan Statistical Area would represent an increase of approximately 0.05 percent in the total population of the New Bern Micropolitan Statistical Area. Therefore, no significant impacts on demographics would occur.

Housing for the increased personnel and their family members would be non-Navy housing off-installation. According to 2010 data, the demand for additional housing units would represent 0.4 percent of all vacant housing units in the New Bern Micropolitan Statistical Area. Increases in housing demand would result in the reduction of current vacant housing stock and, subsequently, increases in property tax receipts and potential increases in the value of houses. No significant impacts on the housing market in the New Bern Micropolitan Statistical Area would be expected.

Employment Characteristics. The total workforce in the New Bern Micropolitan Statistical Area is approximately 59,396 people. The additional personnel would represent an approximate 0.05 percent increase in the current workforce in the New Bern Micropolitan Statistical Area. Employment of spouses and children and the increase in payroll taxes would stimulate the local economy; however, these effects would not be significant.

Schools. The maximum number of school-aged children assumed to move to the New Bern Micropolitan Statistical Area as part of the LCS homeporting would represent approximately 0.2 percent of the current public school enrollment for the Craven County School System.

Environmental Justice and Protection of Children. The New Bern Micropolitan Statistical Area contains a slightly lower minority population as compared to the State of North Carolina. The New Bern Micropolitan Statistical Area has a slightly lower percentage of families living below the poverty compared to the State of North Carolina. The renovation activities would not disproportionately impact minority or low-income populations in off-installation areas. Similarly, there are no environmental health and safety risks identified that would disproportionately affect populations of children; no significant impact on environmental justice would be expected.

Firescout test flights would be conducted in local airspace at MCAS Cherry Point and add 10 to 15 hours of flight operations per month. The test flights would consist of preprogrammed profiles, similar to those of other existing manned and unmanned helicopters currently flown at MCAS Cherry Point, which could be over land or over water depending on air traffic and weather considerations. Therefore, no minority or low-income populations would be disproportionately impacted by Firescout test flights. Similarly, there are no environmental health and safety risks identified that would disproportionately affect populations of children.

Utilities, Infrastructure, and Transportation

NAVSTA Mayport Scenario. No water lines, sanitary sewer and wastewater lines, natural gas lines, or electrical transmission lines would be removed or replaced at NAVSTA Mayport. The utility lines for the facilities under the Proposed Action at NAVSTA Mayport would be connected to the existing systems to support mission requirements.

The additional personnel would result in a slight increase in the demand for water, electricity, and natural gas and the amount of wastewater generated. However, the increases would not be expected to exceed existing capacities. The majority of the area proposed for construction consists of impervious surfaces. However, the increase in impervious surfaces is not anticipated to result in exceedance of existing storm water drainage capacity. No significant impacts on water, electrical, natural gas, and waste systems or storm water drainage would be expected.

The Navy Fuel Depot in Jacksonville has the existing capacity to provide liquid fuels required for the LCSs. The additional demand for fuels from berthing the LCSs would not be expected to exceed the capacity of the fuel farm. No significant impacts on liquid fuel supply would be expected.

Given that more than 19,500 vehicles per day already use Mayport Drive/Maine Street, the additional vehicles associated with LCS personnel would represent a small percentage of the existing traffic. In addition, with varying work schedules, deployments, mass transit options, and carpooling, the additional vehicle trips would be intermittent, and a significant increase in traffic congestion would not be expected. The vehicles used by the family members of military personnel would be driven to NAVSTA Mayport occasionally and would be expected to use varying roadways at various times. Therefore, no significant impacts on transportation would be expected.

Increases in solid waste associated with the renovation activities would be minimal and temporary in nature, and would be disposed of in accordance with relevant Federal, state, and local regulations. Renovation materials would be recycled or reused to the maximum extent practicable. Debris that could not be recycled or reused would be taken off-installation to an approved construction and demolition landfill within the vicinity of NAVSTA Mayport. Therefore, no significant impacts on solid waste management during construction and demolition would be expected.

The addition of approximately 1,700 installation personnel represents a 10.6 percent increase from the 2008 population on the NAVSTA Mayport (Navy 2008). Currently, on average, the landfill receives less solid waste than is permitted. Therefore, the 10.6 percent population increase of on-installation personnel would result in a negligible increase in the amount of solid waste generated. In port, solid waste and recyclables generated onboard the LCSs would be transferred ashore for offsite disposal and recycling. The slight increase in the amount of solid waste generated from the increase in personnel would not be expected to exceed the capacity of existing solid waste disposal facilities.

NAVSTA Mayport-NSB Kings Bay Scenario. Impacts related to utilities, infrastructure, and transportation at NSB Kings Bay for the homeporting of LCSs would be similar to, but less than the impacts discussed for NAVSTA Mayport.

NAVSTA Norfolk Alternative. Impacts on electrical supply, water supply, natural gas supply, the sanitary sewer, wastewater system, and solid waste management at NAVSTA Norfolk from the renovation of buildings to meet updated mission needs would not be expected to be significant. Under the NAVSTA Norfolk Alternative, no water lines, sanitary sewer and wastewater lines, natural gas lines, or electrical transmission lines would be removed or replaced at NAVSTA Norfolk. The utility lines for the facilities under the Proposed Action at NAVSTA Norfolk would be connected to the existing systems to support mission requirements. The additional personnel would result in a slight increase in the demand for water, electricity, and natural gas and the amount of wastewater generated. The NAVTSA Norfolk alternative would not alter existing storm water drainage methods or significantly increase the amount of impervious surfaces at the installation. No significant impacts on water, electrical, natural gas, and waste systems or storm water drainage would be expected.

The Craney Island Fuel Depot in Portsmouth has the existing capacity to provide liquid fuels required for the LCSs. The additional demand for fuels from berthing the LCSs would not be expected to exceed the capacity of the fuel farm. No significant impacts on liquid fuel supply would be expected.

Major access roads, such as Hampton Boulevard, could experience additional congestion. With varying work schedules, deployments, mass transit options, carpooling, and other traffic-calming initiatives at NAVSTA Norfolk, the additional vehicle trips would be intermittent, and a significant increase in traffic congestion would not be expected. The vehicles used by the family members of military personnel would be driven to NAVSTA Norfolk occasionally and would be expected to use varying roadways at various times. Therefore, no significant impacts would be expected.

MCAS Cherry Point. No additional facilities are proposed and no modifications to existing utilities and services are proposed, as such, impacts on utilities, infrastructure and transportation would not be significant. Therefore an analysis of utilities, infrastructure, and transportation impacts at MCAS Cherry Point has not been included.

Hazardous Materials and Wastes

NAVSTA Mayport Scenario. Construction, demolition, and renovation activities would be short-term in nature and would not be expected to generate more waste than the amount allowable by NAVSTA Mayport's large-quantity generator (LQG) classification. The quantity of hazardous wastes generated would be minor and would not be expected to exceed the capacities of on-installation storage or existing hazardous waste disposal facilities. The installation, along with the Navy, has established measures and programs for the management of construction activities to ensure they are conducted in compliance with Federal, state, and local environmental laws and regulations. Therefore, no significant impacts would be expected.

The homeporting of the LCSs would require additional volumes of hazardous materials to be delivered while the ships are in port and on deployment. Hazardous waste generated from the ships would not be expected to exceed the capacities of on-installation storage facilities or the current LQG classification status at NAVSTA Mayport.

The removal of any ACM, heavy metal-containing paint, and PCB-containing materials during demolition activities would be conducted in accordance with applicable regulations and would follow the established measures and programs to ensure they are handled and disposed of in compliance with Federal and state environmental laws and regulations. Therefore, no significant impacts would be expected from the removal of ACM, heavy metal-containing paint, and PCBs during demolition activities.

NAVSTA Mayport-NSB Kings Bay Scenario. Impacts related to the proposed homeporting and facilities under the NAVSTA Mayport Scenario are discussed in the previous section.

The removal of any ACMs, heavy metal-containing paint, and PCB-containing materials during renovation activities for the MMRC at NSB Kings Bay would be conducted in accordance with applicable regulations and would follow the established measures and programs to ensure they are handled and disposed of in compliance with Federal and state environmental laws and regulations. Therefore, no significant impacts would be expected from the removal of ACM, and LBP or heavy metals, or PCBs at NSB Kings Bay.

NAVSTA Norfolk Alternative. Construction and renovation activities would be short-term in nature and would not be expected to generate more waste than the amount allowable by NAVSTA Norfolk's LQG classification. The quantity of hazardous wastes generated would not be expected to exceed the capacities of on-installation storage or existing hazardous waste disposal facilities. The installation, along with the Navy, has established measures and programs for the management of construction activities to ensure they are conducted in compliance with Federal, state, and local environmental laws and regulations. Therefore, no significant impacts would be expected. The homeporting of the LCSs would require additional volumes of hazardous materials to be delivered while the ships are in port and on deployment. Hazardous waste generated from the ships would not be expected to exceed the capacities of on-installation storage facilities or the current LQC classification status at NAVSTA Norfolk.

Since the NAVSTA Norfolk Alternative requires completely new construction and no demolition, no impacts from ACM, LBP, and PCBs would be expected.

MCAS Cherry Point. Since no construction or demolition would occur at MCAS Cherry Point under the Proposed Action, no impacts from ACM, LBP, and PCBs would be expected.

Cultural Resources

NAVSTA Mayport Scenario. The historic properties at NAVSTA Mayport are located more than one-half mile from the proposed construction/demolition areas. An overview survey concluded that most of the installation has been too disturbed or is too recent of a land surface to warrant further archaeological consideration (Navy 2008). The Navy initiated consultation with the Florida SHPO and received concurrence on 23 May 2013. The Florida SHPO concurs with the Navy's determination that the proposed undertakings will have no effect on historic properties and the buildings do not appear to meet the criteria for listing on the National Register of Historic Places (NRHP).

NAVSTA Mayport-NSB Kings Bay Scenario. Impacts at NAVSTA Mayport would be the same as described in the previous paragraphs. No buildings would be demolished and no construction or other ground-disturbing activity would occur at NSB Kings Bay.

There are no known NRHP-listed or -eligible historic structures at NSB Kings Bay and most buildings were constructed after 1962. Because no ground-disturbing activities are planned, there is no potential to affect archaeological resources. Therefore, a "No Historic Properties Affected" determination on NRHP-eligible resources would be expected, and no significant impacts on cultural resources would be expected from implementation of the NSB Kings Bay Alternative.

NAVSTA Norfolk Alternative. Implementation of the Proposed Action at NAVSTA Norfolk could have indirect visual impacts on cultural resources that have been determined eligible for listing in the NRHP, but that impact is not expected to be significant. The proposed construction would occur outside of the NRHP-eligible Naval Supply Depot Historic District, and would be largely obscured by existing non-historic warehouses located immediate to the south of the historic district boundaries. Coordination with the Virginia State Historic Preservation Office (SHPO) during the design phase of new construction in the Naval Supply Depot Historic District could minimize or eliminate any potential adverse effects on historic properties.

MCAS Cherry Point. Baseline conditions for cultural resources, as described previously at MCAS Cherry Point, would remain unchanged. Therefore, a "No Historic Properties Affected" determination on NRHP-eligible resources would be expected, and no significant impacts on cultural resources would be expected from implementation of the Proposed Action at MCAS Cherry Point.

No Action Alternative

Under the No Action Alternative, the Navy would not establish the facilities and functions to support the homeporting of up to14 LCSs on the East Coast of the United States. The No Action Alternative would result in the continuation of existing conditions and would result in no impacts on noise, air quality, human health and safety, coastal zone management, geological resources, biological resources, water resources, socioeconomics (including environmental justice and environmental health and safety risks to children), utilities and infrastructure (including transportation), hazardous materials and wastes, and cultural resources.

Cumulative Effects Analysis

Based on the analyses in this EA, it is anticipated that the alternatives would contribute incrementally to cumulative effects due to impacts associated with construction/renovation activities and personnel

increases, homeporting the LCSs, and Firescout maintenance and test flights (i.e., for noise, air quality, human health and safety, geological resources, biological resources, water resources, socioeconomics and environmental justice, utilities and infrastructure, and hazardous materials and wastes). No significant cumulative effects were identified for any resources. The alternatives would have no cumulative effects on land use, coastal zone management, or cultural resources.

Summary of Findings

No significant, adverse, direct or indirect, cumulative effects on the environment would be anticipated from any of the action alternatives or associated activities, and no mitigation is proposed for the alternatives. Anticipated beneficial, cumulative effects on socioeconomics in the surrounding area would be expected from economic expenditures associated with personnel relocation.

FINAL ENVIRONMENTAL ASSESSMENT ADDRESSING THE HOMEPORTING OF THE LITTORAL COMBAT SHIP ON THE EAST COAST OF THE UNITED STATES

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ACRONYMS AND ABBREVIATIONS

$\mu g/m^3$	micrograms per cubic meter
ACM	Asbestos-Containing Material
AQCR	Air Quality Control Region
BASH	Bird/Wildlife Aircraft Strike Hazard
BMP	best management practices
BRAC	Base Realignment and Closure
C5ISR	Command, Control, Communications, Computers, Combat Systems, Intelligence, Surveillance, and Reconnaissance
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CVN	Nuclear-powered aircraft carrier
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
CZM	Coastal Zone Management
DOD	Department of Defense
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
ERP	Environmental Resource Permit
ESA	Endangered Species Act
ESQD	Explosive Safety Quantity Distance
FAR	Federal Aviation Regulation
FEMA	Federal Emergency Management Agency
FFG	Guided Missile Frigate
FONSI	Finding of No Significant Impact
ft^2	square feet
FY	Fiscal Year
GHG	greenhouse gas
HABS	Historic American Buildings Survey
HAER	Historic American Engineering Record
HERO	Hazards of Electromagnetic Radiation to Ordnance
I	Interstate
ICRMP	Integrated Cultural Resources Management Plan
IRP	Installation Restoration Program
kg	kilogram
km	kilometer
LAMPS	Light Airborne Multi-purpose System
LBP	lead-based paint
LCS	Littoral Combat Ship
LQG	large-quantity generator
LSF	LCS Support Facility
LTF	LCS Training Facility
m^2	square meters
MBTA	Migratory Bird Treaty Act
MCAS	Marine Corps Air Station
mg/m^3	milligrams per cubic meter
MMRC	Mission Module Readiness Center
NAAQS	National Ambient Air Quality Standards
NAS	Naval Air Station

NAVFAC	Naval Facilities Engineering Command
NAVSTA	Naval Station
Navy	U.S. Department of the Navy
NDAA	National Defense Authorization Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NOAA	Nation Oceanic and Atmospheric Administration
NOTU	Naval Ordnance Test Unit
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NSB	Naval Submarine Base
NSF	Naval Support Facility
NWS	Naval Weapons Station
O_3	ozone
OPNAVINST	Office of the Chief of Naval Operations Instruction
Pb	lead
PCB	polychlorinated biphenyl
pCi/L	picoCuries per liter
PM_{10}	particulate matter equal to or less than 10 microns in diameter
$PM_{2.5}$	particulate matter equal to or less than 2.5 microns in diameter
ppb	parts per billion
ppm	parts per million
QDR	Quadrennial Defense Review
RCRA	Resource Conservation and Recovery Act
SAAQS	State Ambient Air Quality Standards
SHPO	State Historic Preservation Office
SO_2	sulfur dioxide
SOP	Standard Operating Procedure
SWMU	Solid Waste Management Unit
SWPPP	Storm Water Pollution Prevention Plan
TMDL	total maximum daily load
tpy	tons per year
U.S.C.	United States Code
UAV	Unmanned Aerial Vehicle
UP	Unprogrammed
USACE	U.S. Army Corps of Engineers
USDA NRCS	U.S. Department of Agriculture Natural Resources Conservation Service
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UST	underground storage tank
VDEQ	Virginia Department of Environmental Quality
VOC	volatile organic compound

1. Purpose of and Need for the Proposed Action

This Environmental Assessment (EA) addresses the proposal of the U.S. Department of the Navy (Navy) to provide facilities and functions to support the homeporting of up to 14 Littoral Combat Ships (LCSs) on the East Coast of the United States. This section presents an introduction to important issues relevant to the project, the purpose of and need for the Proposed Action, and a summary of key environmental compliance requirements.

1.1 Background

The Quadrennial Defense Review (QDR) is a legislatively mandated review of Department of Defense (DOD) strategies and priorities (DOD 2010). The most recent QDR Report, dated February 2010 ("2010 Quadrennial Defense Review"), represents an important step toward institutionalizing the ongoing reform and reshaping of America's military. The 2010 Quadrennial Defense Review aimed at advancing two objectives: (1) further rebalance the capabilities of the U.S. Armed Forces and institutionalize successful wartime innovations, and (2) further reform strategy and policy development and personnel and acquisition processes. The 2010 Quadrennial Defense Review discusses the need to ensure global basing posture is best aligned to address current and future issues (DOD 2010). The *Report to Congress on Strategic Plan for Homeporting the Littoral Combat Ship*, dated March 2011 ("2011 Report to Congress") (Navy 2011b), identifies proposed LCS homeports on the East and West coasts, discusses infrastructure requirements to support LCSs, and identifies the conceptual "2020 disposition of LCS platforms." The 2020 disposition of LCS platforms includes the procurement of a total of 30 LCSs through 2020; up to 14 are planned to be homeported on the East Coast of the United States and up to 16 are planned to be homeported on the West Coast of the United States. This EA assesses the impacts of homeporting up to 14 LCSs on the East Coast by 2020. In addition, this EA assesses related actions associated with the required crews, facilities, and mission packages for the LCS. A separate EA to assess the impacts of homeporting up to 16 LCSs on the West Coast was completed in May 2012.

1.1.1 The Littoral Combat Ship Program

The LCS Program is driven by a security environment that requires improved capability to counter growing threats, violent extremists, illegal cargo shipments, proliferation of weapons of mass destruction and illicit arms, piracy, trafficking, and the need for increased littoral (i.e., nearshore) mobility. The LCS will operate globally and conduct a wide range of military operations, expanding and enhancing current capabilities resident in legacy ship classes (i.e., ships nearing the end of their service life) such as the Oliver Hazard Perry Class frigate (FFG 7), the Cyclone-Class patrol coastal ship (PC 1), and the Avenger-Class mine countermeasures ship (MCM 1) (Navy 2011b).

The purpose of the LCS Program is to provide the Navy with an affordable, shallow-draft, focused-mission ship capable of independent and integrated operations inside the littoral regions. To accomplish such missions, the Navy has determined that the LCS must incorporate endurance, speed, payload capacity, seakeeping (i.e., the ability of a vessel to navigate safely at sea for prolonged periods during stormy weather), shallow-draft, and mission re-configurability into a small ship design. The LCS must be able to operate long distances from home while remaining combat effective. However, since the LCS is a modular design, it will also require a suite of modular weapon systems and associated support equipment capable of being configured to achieve its operational tasking successfully (Rudko 2003).

The LCS Program addresses specific and validated capability gaps in mine countermeasures, surface warfare, and anti-submarine warfare. The operational concept and design specifications for the LCS were developed to meet these gaps with focused mission packages that deploy manned aerial systems

(i.e., MH-60) and unmanned aerial systems (i.e., MQ-8B Firescouts) and remotely piloted and autonomous surface and subsurface vehicles to execute a variety of missions.

1.1.2 Littoral Combat Ship

1.1.2.1 General Description

The LCS has a modular, mission-focused design that provides the Navy with the required warfighting capabilities and operational flexibility to ensure maritime dominance and access. The LCS is a relatively small surface combatant vessel that can complement the Navy's Aegis Fleet, which is the Navy's most modern surface combat system capable of simultaneous warfare on several fronts, including air, surface, and subsurface, by operating in environments where it is less desirable to employ larger, multi-mission ships. The LCS is designed to be capable of underway replenishment (i.e., replenishing a ship's supplies without the need for a port call from ship to ship or from aircraft to ship), which allows it to deploy independently to overseas littoral regions and remain on station for extended periods of time either with a battle group or through a forward-basing arrangement. The LCS can operate with a Carrier Strike Group, with Surface Action Groups, in groups of other similar ships, or independently. The LCS is capable of operating at low speeds for littoral mission operations, transiting at economical speeds, and engaging targets using high-speed sprints (i.e., in excess of 40 knots). The LCS can operate in waters less than 20 feet (6.1 meters) deep. In addition, it can operate in coordination with the U.S. Coast Guard, U.S. Army, U.S. Air Force, U.S. Marine Corps, and allied forces.

The LCS allows the Navy to optimize use of both unmanned aerial systems (i.e., MQ-8B Firescouts) and manned aerial systems (i.e., MH-60 helicopters) to execute necessary missions. LCSs can be networked into the fleet, operating as part of a cohesive, distributed force, sharing tactical information with other Navy aircraft, ships, submarines, and joint units, and launching unmanned and manned aerial systems to execute missions. To conduct successful combat operations in an adverse littoral region, LCSs can employ technologically advanced weapons; sensors; Command, Control, Communications, Computers, Combat Systems, Intelligence, Surveillance, and Reconnaissance (C5ISR) systems (which can gather, process, and disseminate information); propulsion systems; minimal manning concepts; and self-defense systems. The LCS is designed to accomplish all of this with minimal manning.

The LCS consists of two elements: a core seaframe, or base vessel, that possesses inherent capabilities, and interchangeable, tailored combat system packages, known as mission packages, which support specific tasks and include aerial systems. The ability to reconfigure the LCS with different mission packages in a short period of time gives the Navy a flexible response to changing theater warfighting requirements. This also allows the LCS to adapt quickly to evolving threats by simplifying the insertion of new technology.

1.1.2.2 Seaframe

The LCS seaframe provides open-systems architecture and the physical and digital interfaces that support individual mission packages, common control systems for unmanned aerial systems, utilities, and seamless integration to the ship's auxiliary support and C5ISR systems. Other combat systems are not permanently installed in the seaframe. Rather, the major elements of the ship's combat system are embedded in LCS mission packages that are loaded on and off the ship, as needed, for specific functions.

Mission systems (i.e., sensors, weapons, and vehicles) and support equipment are organized to form mission modules. The mission modules plus the crew and support aircraft make up the mission packages (see **Section 1.1.2.3** for further details regarding mission packages). The seaframe provides the space for, and can launch, recover, and handle, various offboard vehicles. Mission packages connect to

standardized, common interfaces that enable complete connectivity between mission systems and their supporting seaframe systems that have been subjected to the stresses inherent in a shipboard environment. Standardized interfaces and strict configuration management controls throughout the life of the ship are required to support system reconfiguration and technology insertion. The mission packages integrate into the seaframe, and any LCS can hold any mission package. The characteristics of the two variants of LCSs (Lockheed Martin variant and Austal variant) are discussed in the following sections.

Lockheed Martin Variant

The Lockheed Martin variant is a steel monohull design, approximately 380 feet (115.8 meters) long with a beam of approximately 58 feet (17.7 meters) and a draft of approximately 13 feet (4.0 meters) (see **Figure 1-1**) (LM 2010, Navy 2011b). The aircraft hangar has space for one MH-60 helicopter and multiple MQ-8B Firescouts (LM 2010).

Source: Fein 2010

Figure 1-1. Lockheed Martin Variant

Austal Variant

The Austal variant is an all aluminum, trimaran hull design (similar to a catamaran but has three separate hulls), approximately 419 feet (127.7 meters) long with a beam of approximately 104 feet (31.7 meters) and a draft of approximately 14 feet (4.2 meters) (see **Figure 1-2**). The aircraft hangar has space for one MH-60 helicopter and multiple MQ-8B Firescouts.

Source: Navy 2009a

Figure 1-2. Austal Variant

1.1.2.3 The Mission Package Concept

The interchangeable mission packages, which allow the LCSs to be reconfigured for anti-submarine warfare, mine countermeasures, or surface warfare, provide the LCSs with additional warfighting capabilities and allow the LCSs to perform specialized missions. Mission systems (i.e., sensors, weapons, and vehicles) and support equipment are organized to form mission modules. The mission modules plus the crew and support aircraft make up the mission packages. Most mission modules would be sized to fit inside standard 20-foot International Standards Organization containers, known as Twenty-foot Equivalent Units (TEUs). Using standard TEU containers facilitates shipping, ease of storage, correct handling equipment, and container movement from shore to ship and ship to shore. The mission packages can be integrated into the LCS so that any seaframe can hold any mission package (NAVFAC 2005).

Mission module reconfiguration occurs in homeport or overseas, using mission modules that are pre-positioned or that are transported into theater by air or sea and staged near the LCS operating area. Mission modules and their equipment would be integrated through standard physical and digital interfaces to core seaframe services (e.g., electrical power, compressed air, water) and the C5ISR system. The mission package configurations can be customized to meet the specific needs associated with anticipated threats, and an LCS can be reconfigured with a new mission package in 1 to 4 days.

1.1.2.4 Missions

The Navy has a requirement for a ship that ensures and enhances friendly force access to littoral regions to conduct the following primary missions:

- *Surface Warfare.* LCSs can provide surface warfare capabilities against hostile small boats while operating in shallow or deep water.
- *Mine Countermeasures.* LCSs can provide mine warfare capabilities, including mine detection to neutralization and avoidance (NAVFAC 2005).
- *Anti-Submarine Warfare.* LCSs can provide anti-submarine warfare capabilities while operating in shallow or deep littoral waters.

In addition to the primary missions, which are enabled by mission packages, the LCS would be tasked to conduct missions that take advantage of its inherent capabilities. These missions include high-speed intra-theater logistics transport; replenishment and refueling of MH-60s at-sea; support for special operations force; launch, recovery, and organizational maintenance of manned and unmanned systems; noncombatant evacuation operations; limited combat search and rescue operations; support for intelligence gathering, surveillance, and reconnaissance; maritime interdiction/interception operations; maritime law enforcement operations; humanitarian assistance and disaster relief; naval diplomatic presence operations (i.e., participate in military exercises with allied nations); freedom of navigation operations (i.e., operations conducted to demonstrate United States or international rights to navigate sea routes); and anti-terrorism/force protection (NAVFAC 2005).

1.1.3 MH-60 Helicopter

The MH-60 helicopters (see **Figure 1-3**), MH-60 detachment, and MH-60 support facilities currently exist at Naval Station (NAVSTA) Mayport. In addition, the MH-60 helicopters are based at Naval Air Station Jacksonville and NAVSTA Norfolk. The homeporting of MH-60 helicopters, MH-60 detachment, and MH-60 support facilities is addressed in the *Final Environmental Assessment for the Homebasing of the MH-60R/S on the East Coast of the United States* dated May 2002 (Navy 2002a). MH-60 helicopter operations associated with the LCSs homeported on the East Coast of the United States would not introduce new operations and no new MH-60s would be homebased as a result of the Proposed Action.

1.1.4 MQ-8B Firescout

The current Firescout Program includes procurement of a total of 168 MQ-8B Firescouts. Of the 168 Firescouts (see **Figure 1-4**), 112 are required to support Fleet operations and 56 are required as backup supply and to support research, development, testing, and evaluation requirements; pipeline requirements; and depot maintenance requirements. Facilities to support the storage, maintenance, and test flights of Firescouts have already been established at Marine Corps Air Station (MCAS) Cherry Point. Therefore, activities associated with the storage, maintenance, and test flights of Firescouts are analyzed in this EA. **Section 2.1.4** details the Firescout component of the Proposed Action.

1.2 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to provide facilities and functions to support homeporting up to 14 LCSs. The LCSs require dedicated shore facilities for crew training; mission package logistical support, maintenance, and preparation; and LCS administration and operations. The Proposed Action is needed to achieve the levels of operational readiness required by 10 United States Code (U.S.C.) § 5062, *United States Navy: composition; functions*. The 2011 Report to Congress (Navy 2011b) identifies proposed LCS homeports on the East and West coasts, discusses infrastructure requirements to support LCSs, and identifies the notional "2020 disposition of LCS platforms." The 2020 disposition of LCS platforms includes the procurement of a total of 30 LCSs through 2020, 14 of which are planned to be homeported on the East Coast of the United States.

Source: Smithsonian Institution undated

Figure 1-3. MH-60 Helicopter

Source: Navy 2009c

Figure 1-4. MQ-8B Firescout

1.3 The Environmental Review Process

The National Environmental Policy Act (NEPA) (42 U.S.C. §§ 4321–4370h) is a Federal statute requiring the identification and analysis of potential environmental impacts associated with proposed major Federal actions before those actions are taken. NEPA established the Council on Environmental Quality (CEQ), which was charged with the development of implementing regulations and ensuring Federal agency compliance with NEPA. The process for implementing NEPA is codified in Title 40 of the Code of Federal Regulations (CFR), §§ 1500–1508, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* (i.e., CEQ regulations). According to CEQ regulations, the requirements of NEPA must be integrated "with other planning and environmental review procedures required by law or by agency so that all such procedures run concurrently rather than consecutively" (40 CFR § 1500.2). The NEPA process does not replace procedural or substantive requirements of other environmental statutes and regulations; it addresses them collectively in the form of an EA or Environmental Impact Statement (EIS), which enables the decisionmaker to have a comprehensive view of key environmental issues and requirements associated with a proposed action.

An EIS is prepared for those Federal actions that might significantly affect the quality of the natural or human environment. An EA is a concise document that provides sufficient analysis for determining whether the potential environmental impacts of a proposed action are significant, requiring the preparation of an EIS, or not significant, resulting in the preparation of a Finding of No Significant Impact (FONSI).

The Navy implements NEPA through *Procedures for Implementing the National Environmental Policy Act* (32 CFR § 775). Additional guidance is found in Secretary of the Navy Instruction 5090.6A, *Environmental Planning for Department of the Navy Actions,* and 5090.1C, *Environmental Readiness Program Manual*. The intent of this EA is to assess the potential environmental impacts from the homeporting of up to 14 LCSs on the East Coast of the United States.

1.4 Public Participation

This Draft EA has been prepared to inform the public of the Proposed Action and to allow the opportunity for public review and comment. The 30-day Draft EA comment period was from 28 February 2013 through 29 March 2013. Public notices were published in the the *Florida Times Union, Brunswick News, Virginian-Pilot*, and the *New Bern Sun* indicating the availability of the Draft EA and the locations where public review copies are available. A press release was also distributed to media outlets serving the area surrounding NAVSTA Mayport, Naval Submarine Base (NSB) Kings Bay, NAVSTA Norfolk, and MCAS Cherry Point. One hard copy and one electronic copy of the Draft EA were placed in the following public locations for review:

Jacksonville Main Library
303 N. Laura Street
Jacksonville, FL 32202

Mary D. Pretlow Anchor Library
111 W. Ocean View Avenue
Norfolk, VA 23503-1608

St. Marys Public Library
100 Herb Bauer Drive
St. Marys, GA 31558

Beaches Branch Library
600 3rd Street
Neptune Beach, FL 32266

Meyera Oberndorf Central Library
4100 Virginia Beach Blvd.
Virginia Beach, VA 23452

Havelock-Craven County Public Library
301 Cunningham Blvd.
Havelock, NC 28532

The Draft EA was also be made available on the following Web site:

- <https://portal.navfac.navy.mil/portal/page/portal/navfac/navfac_ww_pp/navfac_navfacmidlant_pp/midlant_ps/environmental_norfolk/tab3987837>.

The public comment period on the Draft EA was 30 days from the publishing notice date indicating the availability of the document for review. Materials relating to public participation are included in **Appendix A** of this EA.

1.5 Related Environmental Documents

A number of environmental studies have been completed for actions taking place on the East Coast of the United States or related to the LCS program. These have been considered in the preparation of this document and are summarized in the following subsections.

1.5.1 The Environmental Impact Statement for the Homeporting of Additional Surface Ships at Naval Station Mayport, Florida

A Record of Decision for the EIS addressing Homeporting Additional Surface Ships at NAVSTA Mayport, Florida, was signed in 2008. This document analyzed the environmental consequences associated with homeporting additional fleet surface ships at NAVSTA Mayport. The Proposed Action includes permanent assignment of surface ships and personnel. The alternatives analyzed homeporting Cruiser/Destroyers, Amphibious Assault Ships, ships making up an Amphibious Ready Group, a Nuclear Powered Aircraft Carrier (CVN), and combinations of these ships. One alternative also included NAVSTA Mayport as a CVN-capable (i.e., facilities and berthing for CVN on a short-term basis) installation meeting infrastructure homeport requirements. The Record of Decision identified the preferred alternative that involves homeporting one CVN at NAVSTA Mayport and included dredging, infrastructure and wharf improvements, on-station road and parking improvements, and construction of CVN nuclear propulsion plant maintenance facilities at NAVSTA Mayport.

1.5.2 Environmental Assessment for the Home Basing of the MH-60 R/S on the East Coast of the United States

A FONSI for the EA addressing Home Basing of the MH60R/S on the East Coast of the United States was signed in 2002. This document analyzed the environmental consequences associated with home basing the MH-60R/S helicopters on the East Coast of the United States. Aviation detachments supporting the MH-60R/S are located at NAVSTA Norfolk and the Jacksonville Fleet Concentration Area. The FONSI indicated there would be no adverse short-term or long-term impacts at any of the installations as a result of home basing the MH60R/S.

1.5.3 Atlantic Fleet Training and Testing Environmental Impact Statement

An EIS is being prepared to analyze potential impacts on environmental resources resulting from current and historic levels of activities; expansion of the study area and adjustments to types and levels of training and testing activity; and impacts resulting from establishing new range capabilities, modifying existing capabilities, and adjusting the types and levels of training and testing. The Draft EIS was released for public review in May 2012 and the Final EIS is currently being prepared.

1.5.4 Environmental Assessment for the Littoral Combat Ship West Coast Homeport

A FONSI for an EA addressing the Homeporting of the LCS on the West Coast of the United States was signed in 2012. This document analyzed the environmental consequences of homeporting 16 LCS at NAVSTA San Diego. The Navy found that Homeporting the LCSs in San Diego would not significantly affect the quality of the natural or man-made environment.

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2. Description of the Proposed Action and Alternatives

This section describes the Proposed Action and alternatives, including the Preferred Alternative and No Action Alternative. As discussed in **Section 1.3**, the NEPA process evaluates potential environmental consequences associated with a proposed action and considers alternative courses of action. Reasonable alternatives must satisfy the purpose of and need for the Proposed Action, as defined in **Section 1.2**. In addition, CEQ regulations also specify the inclusion of a No Action Alternative against which potential impacts can be compared. While the No Action Alternative would not satisfy the purpose of or need for the Proposed Action, it is analyzed in accordance with CEQ regulations.

2.1 Proposed Action

Under the Proposed Action, the Navy proposes to provide facilities and functions to support the homeporting of up to 14 LCSs on the East Coast of the United States by 2020. This includes homeporting up to either 14 Austal variants, 14 Lockheed Martin variants, or a combination of 14 Austal and Lockheed Martin variants. In accordance with strategic laydown plans, it is estimated that no more than 8 LCSs would be in port at any one time. Therefore, either 8 Austal variants, 8 Lockheed Martin variants, or a combination of 8 Austal and Lockheed Martin variants would be berthed at any one time.

The Proposed Action would include the use of existing facilities and any improvements required to support the LCSs, new land-based training requirements for the LCSs, and stationing LCS crews (i.e., ship company crew, mission package crew, and support personnel) and their dependents. Aircraft systems and crews associated with the LCS (i.e., MH-60 helicopters, MH-60 detachment and associated facilities) are already established and based at Navy installations on the East Coast; therefore, they will not be analyzed in this EA.

The Proposed Action includes use of existing facilities and any improvements required for existing facilities associated with the LCSs and storage and maintenance of unmanned aerial systems (i.e., MQ-8B Firescouts). Under the Proposed Action, Firescout test flights would be conducted at an installation on the East Coast capable of supporting research, development, acquisition, test, and evaluation of these systems. In addition, an estimated total of approximately 1,700 personnel and their family members would be stationed at a Navy installation on the East Coast and approximately 30 personnel and their family members would be stationed at the same installation as the Firescouts.

Navy vessel transit activities, which include in-port operations, were analyzed in the Navy's Virginia Capes, Cherry Point, and Jacksonville EIS, dated June 2009. LCS training and transits in and out of port (i.e., 0 to 3 nautical miles [0 to 5.6 kilometers (km)] from the shoreline), including training and transits in and out of each bay; training and testing involving the use of sonar; pierside sonar maintenance and testing; and the use of active sonar by the LCSs, are currently being addressed in the *Atlantic Fleet Training and Testing Environmental Impact Statement* that is being developed by the Navy to provide continuing coverage for vessel transits and training beginning in 2014. Therefore, in-port operations are not analyzed in this EA.

The following subsections provide descriptions of the homeporting criteria, pierside homeporting requirements, facility requirements, supporting aerial systems associated with the LCSs, and personnel requirements for the LCSs.

2.1.1 Homeporting Criteria

The Navy must optimize the capabilities that already exist within the Navy support framework in homeporting the LCSs. Capability optimization includes maximizing operational synergies and realizing cost efficiencies wherever possible, thereby reducing the overall taxpayer cost. Homeporting the LCSs at an installation within an existing Navy Fleet Concentration Area would maximize operational synergies and cost efficiencies.

Establishing operational and facility siting criteria, discussed in the following subsections, has allowed the Navy to refine preliminary homeporting plans. The LCS homeporting location must be proximate to certain operational capabilities to meet fully the purpose of, and need for, homeporting, and fleet operational considerations are the primary drivers for the selection of potential homeports.

2.1.1.1 Operational Criteria

Operational criteria include the following:

- The homeport location should have existing resources and infrastructure to the maximum extent practicable to reduce overall cost and avoid inefficient redundancy of support infrastructure functions.
- To satisfy best the integrated training requirements in support of the Fleet Response Plan, the homeport location should be proximate to or collocated with the Air Wing components that would deploy on the LCS (i.e., Firescouts and MH-60 helicopters), as these components would be a major factor in the overall LCS combat package.
- To provide a beneficial synergistic effect for interchangeable crews and help standardize and improve effectiveness of all shipboard procedures, the LCSs and associated crews should be homeported in one location.
- To ensure the LCS is best incorporated and integrated into Fleet Strike groups, the LCSs should be located in a major Fleet Concentration Area. Collocation would allow for integrated training and deployment work-ups in support of the Fleet Response Plan.

2.1.1.2 Facility Criteria

Facility criteria include the following:

- The port would have adequate pierside homeporting capabilities, including berthing space and utilities (i.e., water, sewer, electricity, solid waste management, and electronic data access).
- The port would have adequate ordnance loading, offloading, and storage capabilities.
- The port would have an LCS Training Facility (LTF) that includes simulators and electronic classrooms.
- The port would have an LCS Support Facility (LSF) to accommodate LCS Squadron Two and an off-hull crew administrative area.

2.1.2 Pierside Homeporting Requirements

The homeport location for the LCSs would have sufficient equipment and resources available to support them, including ship brow connections, fendering equipment, ship hotel services, utility connections,

cargo handling, maintenance support, drydocking fueling, and ordnance loading/offloading and storage facility. The following paragraphs include a brief description of some of these requirements.

- The pier would be required to have standard ship brows (i.e., planks used to board and deboard a ship or cross from one ship to another) and brow stands (i.e., platforms to support the safe boarding and deboarding of a ship) since LCSs do not carry their own brows. The pier would need to be able to support a 16-foot (4.9-meter) and 19-foot (5.8-meter) freeboard for the Austal and Lockheed Martin variants, respectively.
- The pier would be required to have two to three 8-foot-diameter (2.4-meter-diameter) fenders for both the Austal variant and Lockheed Martin variant.
- The pier would need the capability for each LCS to be tied up on the starboard side of the pier, to facilitate quarterdeck operations and the running of utility cables. The pier would also need to provide 1,600 amps at 440 volts of alternating current for the LCSs to operate.
- The pier would need adequate cargo-handling equipment to support cargo and loading for the LCSs. The pier would need a pierside crane to complete cargo and module loading to and from the amidship (i.e., at the center of the ship) flight deck or to the water's surface for the Lockheed Martin variant. The mission modules would go directly through a deck hatch to the mission bay or from the water into the mission bay using the ship's off-board vehicle launch and recovery system. For the Austal variant, the pier would need to be able to support the use of truck-mounted cranes, small material-handling equipment, or equipment from the water's surface into the mission bay using the ship's off-board vehicle launch and recovery system to complete cargo and module loading.
- The pier would need to support fueling in accordance with Office of the Chief of Naval Operations Instruction (OPNAVINST) 5090.1C, Chapter 22-9, *Oil and Hazardous Substance Spills.* Shore-based facility response teams would be required at the homeport location to respond to port spills and ensure that any spills are readily contained and recovered using local facility equipment.

2.1.3 Facility Requirements

This section presents a summary of the facilities required to support the homeporting of the LCSs under the Proposed Action.

- LCS Training Facility. An LTF would be required to provide a facility for surface warfare training. The LTF would need to include the following: integrated bridge (i.e., ship's command center) and combat systems tactical scenario training, and hands-on systems training (e.g., mission bay, crew-served weapons) for sailors serving on board an LCS; a "virtual" environment for sailors to practice their skills and train for LCS deployment; multiple simulators, such as bridge and mission bay for ship crew, networked into a virtual interactive ship; and mission module simulators for mission crews and electronic classrooms. In addition, the LTF would need to be located within a reasonable distance from the homeport location to minimize the commute for seaframe and mission package crews.
- LCS Support Facility. An LSF would be required to house administrative offices for the associated squadron staff, maintenance support teams, and off-hull crews. To provide the most efficient use of resources, the facility would be located at the same installation where the LCSs are homeported. The size of the LSF would be determined by the number of LCSs present at the homeport.

- Mission Module Readiness Center. A primary Mission Module Readiness Center (MMRC) would be needed to provide mission module maintenance, sustainment, reconfiguration, and storage. The MMRC would be required to have high-level maintenance capabilities, such as major overhaul or complete rebuilding. The MMRC can function as an independent facility, but it must be located within a DOD installation due to the highly sensitive nature and the high monetary value of the individual modules. The MMRC would not be required to be located in close proximity to the homeport location, since the mission packages could be transported by truck from the MMRC to the homeport location approximately 30 to 60 days prior to deployment of an LCS.

2.1.4 Aviation Asset Support Requirements

This section presents a summary of the supporting aerial systems associated with the LCSs, the Firescout Program, and facilities that would be required under the Proposed Action to support the unmanned aerial systems (i.e., Firescouts).

Aerial Systems. Under the Proposed Action, the supporting aerial systems associated with the LCSs, the MQ-8B Firescout, and MH-60 helicopter, would be managed and operated by an MH-60 detachment. As discussed in **Section 1.1.3**, MH-60 helicopter operations associated with the LCSs homeported on the East Coast of the United States would not introduce new operations.

Firescout Program. As discussed in **Section 1.1.4**, 112 Firescouts are required to support Fleet operations and 56 are required as backup supply and to support research, development, testing, and evaluation requirements; pipeline requirements; and depot maintenance requirements.

The Firescout is a rotary-wing, unmanned aerial system that weighs approximately 1.5 tons (1.4 metric tons), is approximately 10 feet (3.0 meters) tall and 24 feet (7.3 meters) long, and has a rotor diameter of approximately 28 feet (8.5 meters). The Firescout is composed of a single gas turbine engine, environmental control systems, main and tail rotor blade pitch control systems, and main and tail rotor gearboxes. It has minimal maintenance requirements because it does not possess crew support systems. The Firescout airframe, or mechanical structure of the aircraft, is an Intelligence, Surveillance, and Reconnaissance platform, which enables operators on board a ship to examine areas over the horizon. This aircraft aids in search and rescue, surveillance, logistics, mine warfare, surface warfare, and antisubmarine warfare. Specifically, the Firescout ensures land areas are clear for amphibious craft, provides overhead communications relay, conducts intelligence gathering, and detects targets. The Firescout can be quickly deployed to critical locations worldwide via cargo aircraft (Navy 2009b).

Storage and Maintenance Facilities. Approximately 17,000 ft^2 square feet (ft^2) (1,579.4 square meters [m^2]) of storage and maintenance facilities would be required to support the Firescouts. While on shore, up to 8 Firescouts could be in a maintenance cycle at any one time and would need access to an airfield flight line for test flights. The Firescouts not in a maintenance cycle would be stored in a preserved state (i.e., defueled with the battery disconnected) to preserve airframe life.

Firescout Test Flights. Firescout test flights would be required to verify that maintenance has been performed properly. The test flights would need to be conducted in Class D airspace or Restricted Area airspace capable of supporting research, development, acquisition, test, and evaluation aviation activities. Class D Airspace includes airspace from the ground surface to 2,500 feet (762.0 meters) above the airport elevation, and Restricted Area includes airspace in which aircraft are prohibited from entering without advance permission. Each test flight would consist of a preprogrammed profile. One test flight for each Firescout would last approximately 30 minutes. There would be a total of approximately 10 to 15 hours

per month of flying time for all of the Firescouts; which equals approximately 180 hours of flying per year.

Approximately 30 to 60 days prior to deployment of an LCS, the Firescouts would be transported from the installation capable of supporting research, development, acquisition, test, and evaluation aviation activities to existing facilities collocated with the MH-60 squadron detachment where they might be checked for functionality (i.e., turned on to ensure they are functioning properly, but not flown), if necessary; no flight operations would be conducted. From there, the Firescouts, MH-60 detachment, and associated equipment would be transported by truck to the LCS homeport where they would be staged on the LCS. The MH-60 helicopters would be flown out to the LCSs already on deployment at sea.

2.1.5 Personnel Requirements

The LCS has a modular, mission-focused design and minimal manning concept. The LCSs would rely on specialized mission package crews, which would consist of 15 to 19 personnel that could be interchanged depending on the ship's current and projected tasking. Similarly, the LCSs would rely on the ship company crew, which would consist of up to 50 personnel that could also be interchanged, allowing the ship to be maintained on-station for longer periods of time by swapping crews, as necessary. Each crew assigned to an LCS would include the LCS ship company crew (up to 50 personnel) and the mission package crew (up to 19 personnel depending on the mission) (Navy 2011c). It is proposed that these individuals would be stationed, or based, at the LCS homeport.

The Proposed Action includes stationing up to 21 crews (up to 1,050 ship company crew personnel and up to 399 mission package crew personnel) and approximately 244 on-installation LCS support personnel at a Navy installation on the East Coast. This would equate to a total increase of approximately 1,700 personnel (not including family members) for all 14 LCSs. There would be up to 21 crews available for the 14 LCSs; however, 6 ships would be deployed leaving 8 LCSs and 15 crews in port at any one time. The 15 crews and 244 on-installation LCS support personnel would equate to approximately 1,300 personnel (not including family members) in port at any one time.

For purposes of this analysis, it is estimated that each of the approximately 1,700 personnel would be accompanied by 1.12[1] family members. Therefore, the total number of people (Navy personnel [1,700 people] and their family members [1,904 people]) at a Navy installation is estimated to be approximately 3,600.

To support the storage, maintenance, and test flights of Firescouts, approximately 30 on-installation personnel would be stationed at the same installation as the Firescouts. In addition, if the MMRC facility was not constructed at the same location that the LCSs were homeported, then an additional 30 people would be required at that facility. If each Navy personnel is accompanied by 1.12 family members, the total number of people (Navy personnel [30 people] and their family members [34 people]) is estimated to be approximately 64.

2.2 Alternatives Analysis

Under NEPA, reasonable alternatives to implement a proposed action must be considered in an EA. Considering alternatives helps to avoid unnecessary impacts and allows an analysis of reasonable ways to achieve the stated purpose. To warrant detailed evaluation, an alternative must be considered reasonable.

[1] The ratio of 1.12 family members per sailor was derived from a Navy manning source (Kelley 2010).

To be considered reasonable, an alternative must be capable of implementation and satisfactory with respect to meeting the purpose of and the need for an action.

2.2.1 Homeporting Alternatives Considered

Based on the criteria (including operational and facility criteria), two homeporting alternatives (NAVSTA Mayport Alternative [Alternative 1] and NAVSTA Norfolk Alternative [Alternative 2]) were considered reasonable alternatives and are carried forward for detailed analysis in this EA.

2.2.1.1 NAVSTA Mayport Alternative (Alternative 1)

Under the NAVSTA Mayport Alternative, the Navy proposes to provide facilities and functions to support the homeporting of up to 14 LCSs at NAVSTA Mayport and use a combination of existing military assets in the Southeast Region (e.g., NAVSTA Mayport–NSB Kings Bay) to provide berthing space, ship hotel services, maintenance support, drydocking facilities, fueling services, ordnance handling and storage, cargo and mission module handling and storage, support facilities, and aviation asset support. No in-water construction projects would be required under the Preferred Alternative.

Under the NAVSTA Mayport Alternative, the following two scenarios were considered and carried forward for further detailed analysis:

- *Scenario 1 – NAVSTA Mayport.* This Scenario includes homeporting up to 14 LCSs, establishing the required LCS support facilities, and stationing LCS crews at NAVSTA Mayport.
- *Scenario 2 – NAVSTA Mayport-NSB Kings Bay*. This Scenario includes homeporting up to 14 LCSs at NAVSTA Mayport, establishing one of the required facilities for LCS, the MMRC at NSB Kings Bay, and stationing LCS crews at NAVSTA Mayport.

Locations

NAVSTA Mayport. NAVSTA Mayport is a Fleet Concentration Area in Jacksonville, Florida, composed of more than 3,409 acres with easy access to the open ocean (see **Figure 2-1**). NAVSTA Mayport is host to more than 80 tenant commands including 17 naval ships and 4 Light Airborne Multi-Purpose System (LAMPS) Mark III helicopter squadrons. NAVSTA Mayport is also the operational and training headquarters for the SH-60B/SH-60R Seahawk LAMPS Mark III with a primary mission of anti-submarine warfare. NAVSTA Mayport has a harbor that can accommodate 34 ships and an 8,000-foot (2,438.4-meter) runway capable of handling any aircraft in the DOD inventory (CNIC 2010). **Figure 2-2** shows an expanded view of NAVSTA Mayport.

NSB Kings Bay. NSB Kings Bay is in Kings Bay, Georgia, approximately 49 miles (79 km) from NAVSTA Mayport (see **Figure 2-3**). NSB Kings Bay is the Navy's Atlantic Fleet homeport for the Ohio class nuclear submarines with approximately 16,000 acres (CNIC undated). NSB Kings Bay is currently host to eight Ohio class nuclear submarines, including six ballistic missile submarines and two guided missile submarines, and four major tenant commands: Strategic Weapons Facility, Atlantic; Submarine Group 10; the Trident Training Facility; and the Trident Refit Facility (CNIC undated).

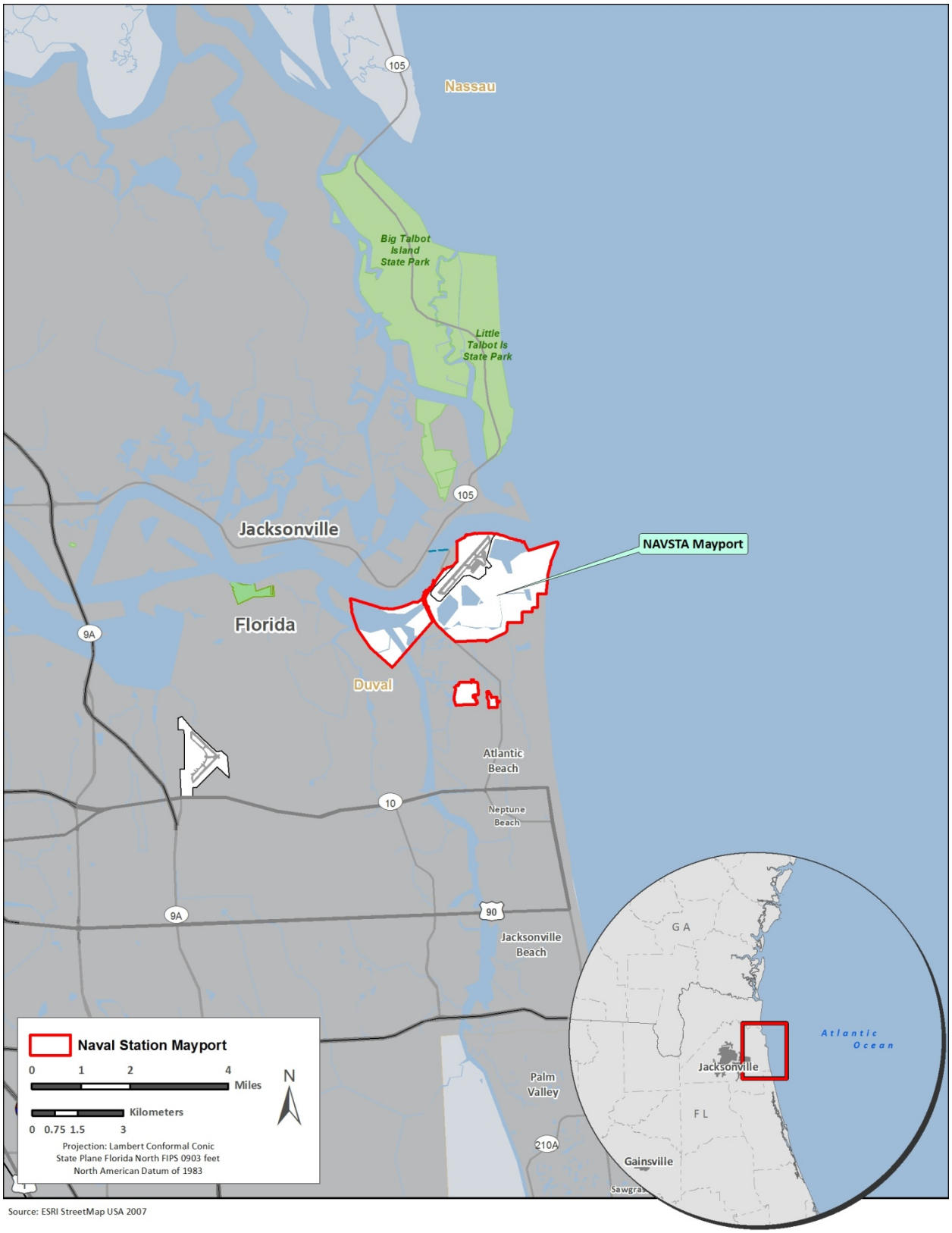

Figure 2-1. Location of NAVSTA Mayport and Surrounding Areas

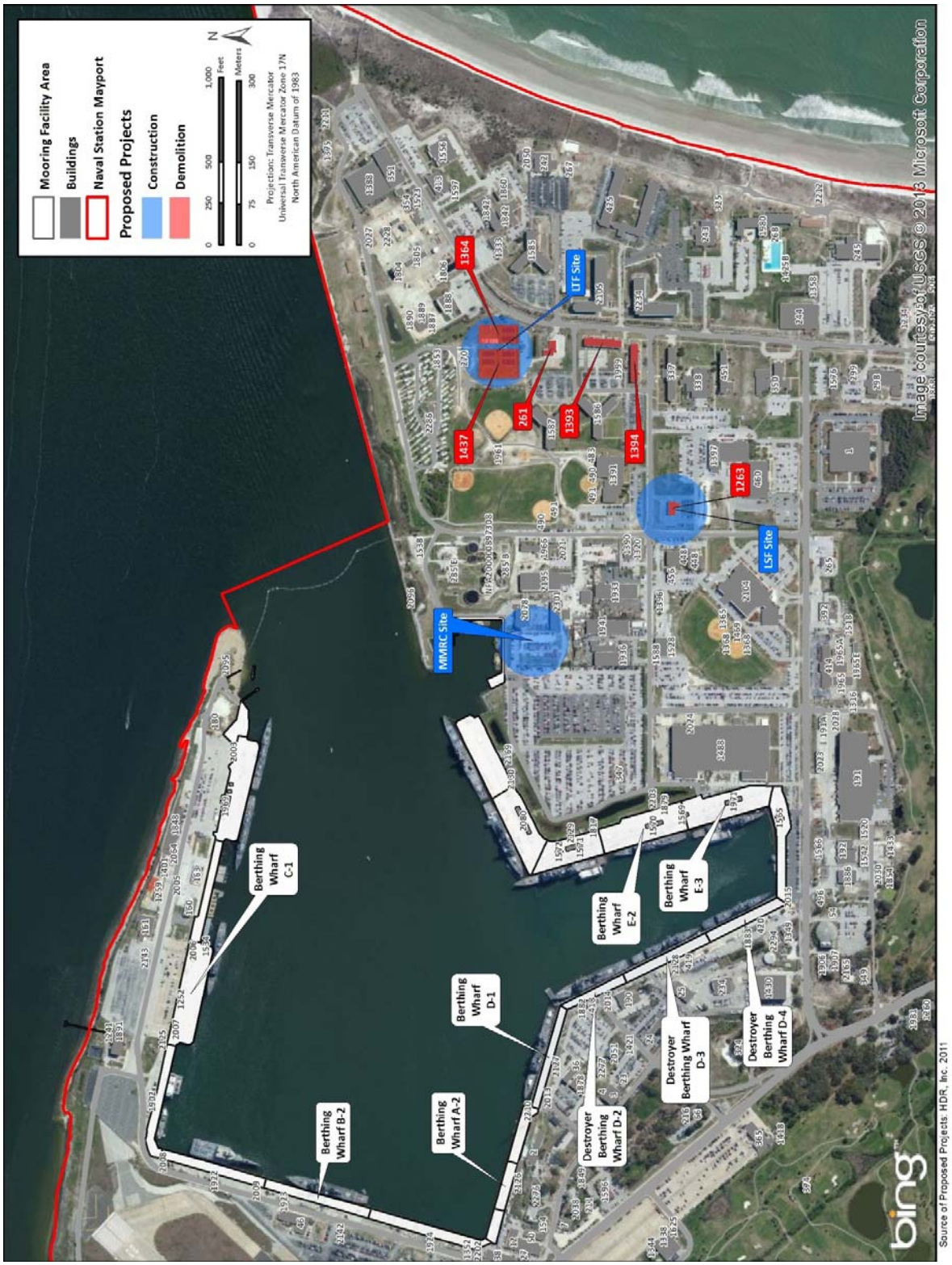

Figure 2-2. Expanded View of NAVSTA Mayport

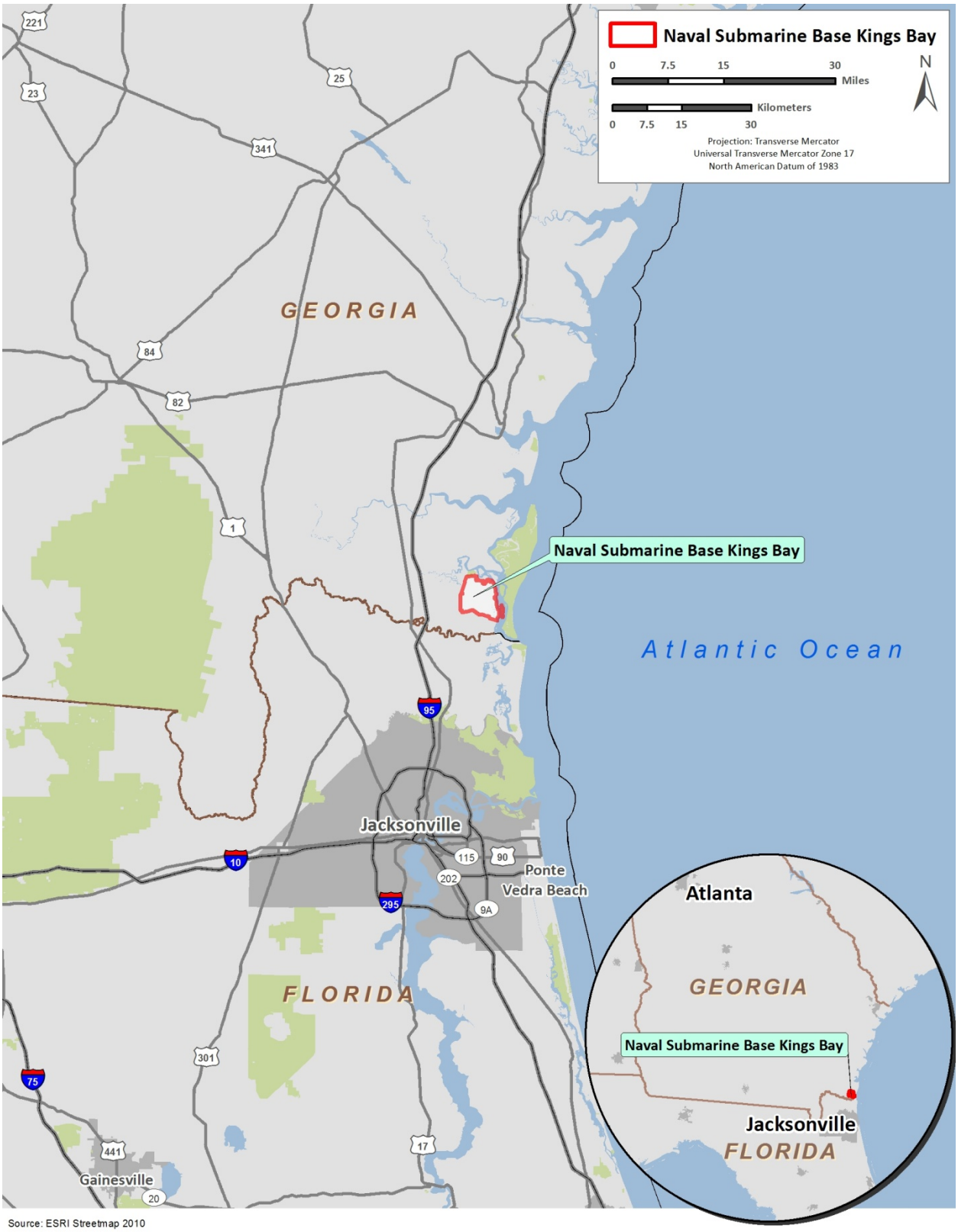

Figure 2-3. Location of NSB Kings Bay and Surrounding Areas

Scenario 1 – NAVSTA Mayport

Up to 14 LCSs would be homeported at NAVSTA Mayport by 2020, the required facilities would be established at NAVSTA Mayport, and LCS crews and their family members would be stationed at NAVSTA Mayport. The Navy proposes to use existing military assets at NAVSTA Mayport to provide berthing space, ship hotel services (utilities), maintenance support, drydocking facilities, fueling services, ordnance handling and storage, cargo handling and storage, and stationing for personnel and their family members. New construction would be required for the LTF, LSF, and MMRC.

FFG class ships at NAVSTA Mayport are undergoing phased decommissioning between 2011 and 2015 (Navy 2011f). It is anticipated that FFG decommissioning will make available berthing and infrastructure (e.g., power and pier space) for other vessels to be homeported (Mabus 2011). As a result, the total number of destroyers and cruisers at NAVSTA Mayport would remain relatively steady as LCSs begin arriving in 2016.

Pierside Homeporting Capabilities. The pierside homeporting capabilities that would support the homeporting of up to 14 LCSs under NAVSTA Mayport Scenario are summarized in the following paragraphs.

Facilities. At NAVSTA Mayport, existing land-based facilities do not currently exist for long-term support of the LCSs. Therefore, it is assumed that new construction would be required at NAVSTA Mayport to establish the following facilities associated with the LCS:

- *LTF*. The proposed LTF would consist of a multi-story building and mission bay (i.e., high bay) with an approximately 109,420-ft^2 (10,165-m^2) footprint.
- *LSF*. The proposed LSF would consist of an approximately 81,710-ft^2 (7,591-m^2) building with approximately 105,399 ft^2 (9,791 m^2) of parking space.
- *MMRC.* The proposed MMRC would be approximately 15,810 ft^2 (1,468 m^2) and would include 10,800 ft^2 (1,003 m^2) of exterior covered space, which would equate to approximately 26,610 ft^2 (2,472 m^2). The purpose of the MMRC is to support mission module storage prior to shipboard loadout and allow personnel to ready mission modules on the waterfront prior to and after shipboard deployment.
- *MMRC Annex.* Construction of a MMRC would not be completed in time for homeporting of the first LCS at Mayport; therefore, a temporary MMRC Annex would be required. The MMRC Annex would serve the same functions as the MMRC (support mission module storage prior to shipboard loadout and allow personnel to ready mission modules on the waterfront) and would only be used until the construction of the MMRC is completed.

All reasonable efforts would be made for new construction to take place on already disturbed ground so as not to cause any new environmental impacts. Building 448 is the current Destroyer Squadron administrative building and it would be reused as the new LCS Squadron building, serving part of the LSF requirement. In addition to Building 448, the available footprint of Building 1388 is intended to be used for some of the LTF simulator requirements.

Demolition of up to four existing buildings and two sets of tennis courts would need to occur to construct the LTF and LSF. Refer to **Table 2-1** and **Figure 2-3** for which buildings would need to be demolished.

Table 2-1. Building Demolitions Under the NAVSTA Mayport Scenario

LCS Facility	Required Building Demolition
LTF	1364*, 1437*, 261, 1393, 1394
LSF	1263
MMRC	None

Note: * Tennis Courts

Personnel. The crews (ship company crew and mission package crew) would be stationed, or based, at the LCS homeport location. There would be up to 21 crews available for the proposed 14 LCSs. Up to 15 crews would be in port at any one time stationed on the eight in-port ships. For purposes of this EA, it is assumed that up to 21 crews (up to 1,050 ship company crew personnel and up to 399 mission package crew personnel) would be stationed at NAVSTA Mayport. In addition, 244 on-installation LCS support personnel would be stationed at the homeport location. This would equate to a total increase of approximately 1,700 personnel for all 14 LCS. It is estimated that each of the personnel would be accompanied by an average of 1.12 family members. Therefore, the total number of people (Navy personnel [1,700 people] and their family members [1,904 people]) is estimated to be approximately 3,600.

Scenario 2 – NAVSTA Mayport-NSB Kings Bay

Under this scenario, up to 14 LCSs would be homeported at NAVSTA Mayport by 2020, the LCS crews and their family members would also be stationed at NAVSTA Mayport. The MMRC would be established at NSB Kings Bay. The Navy proposes to use existing military assets at NAVSTA Mayport to provide berthing space, ship hotel services (utilities), maintenance support, drydocking facilities, fueling services, ordnance handling and storage, cargo handling and storage, and stationing for personnel and their family members. Due to its geographic proximity to NAVSTA Mayport, NSB Kings Bay was considered an alternative location for the MMRC. Mission modules would be transported to NAVSTA Mayport as needed. An MMRC Annex would be required at NAVSTA Mayport to serve as the waterfront support facility to stage mission modules prior to shipboard loading/unloading.

Pierside Homeporting Capabilities. The pierside homeporting capabilities that would support the homeporting of up to 14 LCSs under NSB Kings Bay Scenario are the same as those discussed for NAVSTA Mayport Scenario (refer to **Table 2-1** and **Figure 2-3**).

Facilities. At NSB Kings Bay, an existing land-based facility would be used and upgraded, if necessary, to provide long-term support to the LCSs. Therefore, no new buildings would be required to establish the MMRC. Building 5087 is sufficient in size to accommodate the MMRC functions. This building is the current Trident Refit Facility and would be reused as the MMRC. Establishing an MMRC at NSB Kings Bay would require the establishment of a permanent MMRC Annex at NAVSTA Mayport since that is where the mission modules would be loaded and unloaded prior to and immediately after deployments aboard an LCS. The MMRC Annex at NAVSTA Mayport would support mission module staging prior to shipboard loading/unloading and would allow personnel to ready mission modules on the waterfront.

Personnel. Similar to NAVSTA Mayport Scenario, it is assumed that approximately 1,700 personnel would be stationed at NAVSTA Mayport. With approximately 1,900 family members, there would be an addition of approximately 3,600 people. In addition, there would be approximately 30 combined military, civilian, and contract-support personnel required for staffing the MMRC at NSB Kings Bay. As ships prepare to load and unload, the same support personnel would accompany the mission modules to the MMRC Annex at NAVSTA Mayport. If each Navy personnel is accompanied by an average of

1.12 family members, the total number of people (Navy personnel [30 people] and their family members [34 people]) is estimated to be approximately 64. This would equate to a total increase of approximately 64 personnel at NSB Kings Bay.

2.2.1.2 NAVSTA Norfolk Alternative (Alternative 2)

NAVSTA Norfolk is a Fleet Concentration Area in Norfolk, Virginia, composed of approximately 6,404 acres with access to the Atlantic Ocean via the Chesapeake Bay (see **Figure 2-4**). NAVSTA Norfolk is host to more than 386 tenant commands. The waterfront accommodates facilities and operations necessary to support approximately 65 naval ships along 14 piers. **Figure 2-5** shows an expanded view of NAVSTA Norfolk. This installation includes an air station with MH-60 helicopter squadron support (CNIC 2012).

Under NAVSTA Norfolk Alternative, up to 14 LCSs would be homeported at NAVSTA Norfolk by 2020, the required LCS support facilities would be established, and the LCS crews and their family members would be stationed at NAVSTA Norfolk. The Navy proposes to use existing military assets at NAVSTA Norfolk to provide berthing space, ship hotel services (utilities), maintenance support, drydocking facilities, fueling services, ordnance handling and storage, cargo handling and storage, and stationing for personnel and their family members. New construction would be required for the LTF, LSF, and MMRC.

In the event of berthing shortages at NAVSTA Norfolk, Joint Expeditionary Base Little Creek-Fort Story could be used as an "overflow" berthing location as needed for LCSs or other ships. No new support facilities, piers, or dredging operations are planned or programmed at JEB Little Creek to support this use. Furthermore any contingency operations involving the potential use of JEB Little Creek would be subject to additional environmental documentation prior to any action being taken.

Pierside Homeporting Capabilities. The pierside homeporting capabilities that would support the homeporting of up to 14 LCSs under the NAVSTA Norfolk Alternative are summarized in the following paragraphs.

Facilities. At NAVSTA Norfolk, available land-based facilities do not currently exist for long-term support of the LCSs. Therefore, it is assumed that new construction would be required. The Z-area north of Building Z-309 and south of Morris Street is a notional location to establish the following facilities associated with the LCS:

- *LTF*. The proposed LTF would be approximately 109,420 ft^2 (10,165 m^2) and would be collocated with other LCS facilities at NAVSTA Norfolk. The high bay area of the LTF would be sized to accommodate the respective simulators of each LCS variant (NAVFAC 2009a).
- *LSF*. The proposed LSF would be an approximately 81,710-ft^2 (7,591-m^2), multi-story facility with an associated parking area (160 parking spaces). The proposed LSF would be collocated with other LCS facilities at NAVSTA Norfolk.
- *MMRC.* The proposed MMRC would be approximately 15,810 ft^2 (1,468 m^2) and would include 10,800 ft^2 (1,003 m^2) of exterior covered space, which would equate to approximately 26,610 ft^2 (2,472 m^2) and would be collocated with other LCS facilities at NAVSTA Norfolk (NAVFAC 2012a).
- *MMRC Annex.* Until the MMRC is established at NAVSTA Norfolk, a temporary MMRC Annex would be required. The MMRC Annex would serve the same functions as the MMRC and would only be used until the MMRC is established. In addition, the MMRC Annex would support mission module storage prior to shipboard loadout and would allow personnel to ready mission modules on the waterfront.

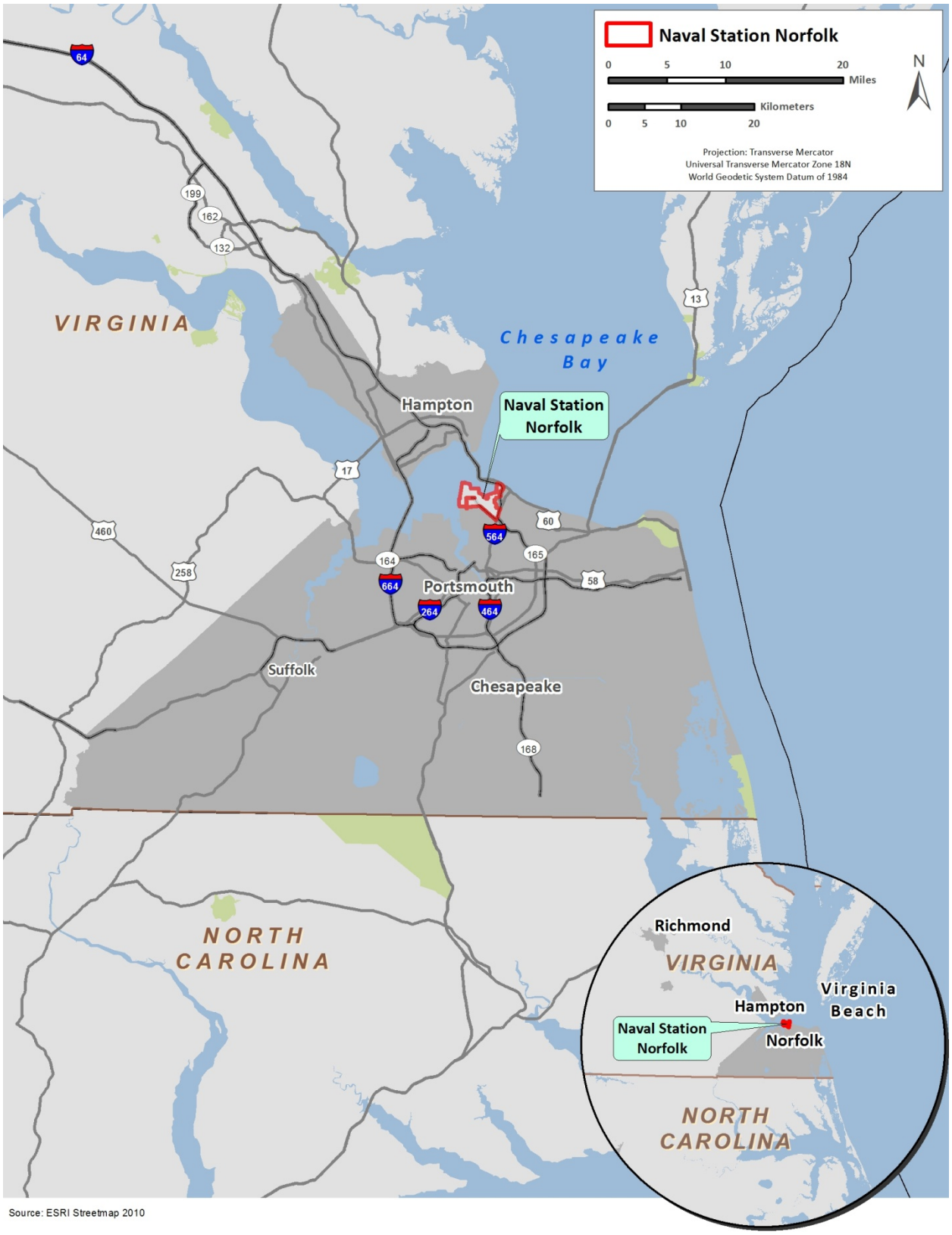

Figure 2-4. Location of Naval Station Norfolk and Surrounding Areas

Source of Proposed Projects: HDR, Inc. 2012

Figure 2-5. Expanded View of Naval Station Norfolk

Personnel. Similar to NAVSTA Mayport Scenario, it is assumed that approximately 1,700 personnel would be stationed at NAVSTA Norfolk. With approximately 1,900 family members, there would be an addition of approximately 3,600 people.

2.2.2 Aviation Asset Support Component

2.2.2.1 MCAS Cherry Point

Under the Proposed Action, 112 Firescouts are required to support Fleet operations and 56 are required as backup supply and to help support requirements such as research and development. Facilities to support the storage, maintenance, and test flights of Firescouts have already been established at MCAS Cherry Point. The maintenance and test flights of Firescouts are analyzed in this EA. Minor land-based facility improvements (i.e., renovations) would occur; no in-water construction projects would be required under the Proposed Action at MCAS Cherry Point.

MCAS Cherry Point is in Havelock, North Carolina, which is in the eastern part of the state (see **Figure 2-6**). MCAS Cherry Point includes 13,164 acres on the installation with an additional 15,975 acres of auxiliary activities, including Marine Corps Auxiliary Landing Field Bogue, along Bogue Sound in Carteret County. The installation was built in 1941 and is currently home to the 2nd Marine Aircraft Wing. The wing consists of six groups: four aircraft groups that fly combat aircraft, one aircraft control group, and one engineer group. MCAS Cherry Point hosts Marine Air Group 14 and also serves as the host installation for Commander Marine Corps Air Bases East. Marine Air Group 14 is the primary East Coast operating unit for the Marine Corps AV-8B Harrier (four squadrons) and EA-6B Prowler (four squadrons). The Group also includes four squadrons of KC-130 tankers and an Unmanned Aerial Vehicle (UAV) squadron.

Aerial Systems. The supporting aerial systems associated with the LCSs are the MQ-8B Firescout and MH-60 helicopter, which would be managed and operated by an MH-60 detachment. As discussed in **Section 1.1.3**, the MH-60 helicopters, MH-60 detachment, and MH-60 support facilities currently exist at NAVSTA Mayport. The homeporting of these helicopters and support facilities are addressed in the *Final Environmental Assessment for the Homebasing of the MH-60R/S on the East Coast of the United States* dated May 2002 (Navy 2002a). Details regarding the storage, maintenance, and test flights required for the MQ-8B Firescout are presented in this section.

Storage and Maintenance Facilities. MCAS Cherry Point has existing facilities available to support the storage, maintenance, and test flights of Firescouts. Existing buildings would be used and, if necessary, interior and exterior renovations could be completed to support the storage and maintenance of Firescouts. Facilities would be used for maintenance, hangar space, and aircraft storage.

Firescout Test Flights. Firescout test flights, or maintenance flights, would be required at MCAS Cherry Point to verify that maintenance has been performed properly. The airspace and range complex managed by MCAS Cherry Point includes four Restricted Areas, a Military Operations Area, and an Air Traffic Control Assigned Airspace. In addition, MCAS Cherry Point units are the primary users of offshore airspace. MCAS Cherry Point also maintains a satellite field at Marine Corps Auxiliary Landing Field Bogue in Bogue, North Carolina, and at an outlying airfield at Marine Corps Outlying Field Atlantic in Atlantic, North Carolina. Numerous types of aircraft and helicopters, including UAVs, currently operate out of MCAS Cherry Point. UAVs use specific Federal Aviation Administration (FAA) protocols and may fly from MCAS Cherry Point to the surrounding training areas.

Figure 2-6. Location of MCAS Cherry Point and Surrounding Areas

The Firescout test flights would consist of preprogrammed profiles, similar to those of other existing manned and unmanned helicopters. Test flights of Firescouts would be the only flight operations conducted at MCAS Cherry Point. One test flight for each Firescout would be approximately 30 minutes and would not leave local airspace. There would be a total approximately of 10 to 15 hours per month of flying time for all of the Firescouts, which equals approximately 180 hours of flying time per year.

New, potentially hazardous materials associated with the Firescouts would be identified as part of the Logistics Management Information and Programmatic Environment, Safety, and Occupational Health Evaluation. All Firescout test flights would be conducted in accordance with Federal Aviation Regulation (FAR) Part 91; OPNAVINST 3710.7U, *Naval Air Training and Operating Procedures Standardization General Flight and Operating Instructions*; Naval Air Forces Instruction 4790.2; Firescout-specific operating manuals; DOD Flight Information Publications and Clearance Manuals; and Federal, state, and local aviation-related rules, restrictions, laws, and ordinances. Emergencies or malfunctions associated with the Firescout test flights would be handled in accordance with OPNAVINST 3710.7U and established aircraft-specific procedures. In the event of an emergency during a test flight, the Marine Corps Auxiliary Landing Field Bogue could function as a secondary emergency landing site.

Approximately 30 to 60 days prior to deployment of an LCS, the Firescouts would be transported from MCAS Cherry Point to existing facilities at NAVSTA Mayport or NAVSTA Norfolk where they might be checked for functionality (i.e., turned on to ensure they are functioning properly, but not flown), if necessary. There would be no flight operations conducted at NAVSTA Mayport or NAVSTA Norfolk. There would be temporary storage at existing facilities for the transfer of Firescouts to and from the LCSs. Upon completion of deployment, the LCSs would return to port and the Firescouts would be transported back to MCAS Cherry Point (if required), where they would be maintained and stored, as needed. At any time, some of the Firescouts could be in storage or in maintenance cycle at MCAS Cherry Point or embarked on an LCS at sea.

Personnel. There would be approximately 30 support personnel required to support Firescouts at MCAS Cherry Point. If each Navy personnel is accompanied by an average of 1.12 family members, the total number of people (Navy personnel [30 people] and their family members [34 people]) is estimated to be approximately 64. This would equate to a total increase of approximately 64 personnel at MCAS Cherry Point.

2.2.3 Alternatives Considered but Eliminated from Detailed Analysis

Based on the homeporting criteria (including operational and facility criteria), as discussed in **Section 2.1.1**, the following alternatives were considered but eliminated from further detailed analysis in this EA.

2.2.3.1 Non-East Coast Alternatives

As stated in **Section 2.1**, the Navy proposes to provide facilities and functions to support the homeporting of up to 55 LCSs at installations around the world (NAVFAC 2005). The Navy does not decide homeport locations for each ship within an entire class prior to contracting and years ahead of delivery, as the ability to modify, postpone, or shift individual homeport assignments is a strategic necessity in response to emergent threats, changes in the overall security environment, and programmatic adjustments. The Navy continuously evaluates homeporting plans for all surface combatants to ensure that strategic planning keeps pace with global events. In 2008, Congress requested that the Navy develop a notional Homeporting Plan for the LCSs. This plan was created so that Congress could consider the impacts of Homeporting the LCSs at NAVSTA Mayport. The 2010 QDR (DOD 2010), related Navy strategic documents, and the Annual Long-Range Plan for Construction of Naval Vessels present the elements requested in the Senate Armed Services Committee 2011 National Defense Authorization Act (NDAA) Report (Navy 2011a).

The 2011 NDAA Report identifies proposed LCS homeports on the East and West coasts, discusses infrastructure requirements to support LCSs, and identifies the "2020 disposition of LCS platforms." The 2020 disposition of LCS platforms includes the procurement of 30 LCSs by 2020; 14 are planned to be homeported on the East Coast of the United States and 16 are planned to be homeported on the West Coast of the United States.

2.2.3.2 Homeporting up to 14 LCSs at NAVSTA Mayport and NAVSTA Norfolk

The alternative for homeporting up to 14 LCSs at both NAVSTA Mayport and NAVSTA Norfolk is not considered a reasonable alternative because this alternative does not meet all of the homeporting criteria, as discussed in **Section 2.1.1**. Homeporting up to 14 LCSs at both installations would not allow collocation of LCS and crew, and thus require redundant support facilities, although the impacts of such an action are evaluated with the examination of homeporting up to 14 ships at each location.

2.2.3.3 Site Alternatives

This section discusses installations that were initially considered as alternatives for the homeporting of LCSs; however, upon further evaluation, the installations discussed in the following subsections were eliminated from further detailed analysis in this EA.

Naval Weapons Station (NWS) Earle. Currently, no Navy surface combatant ships are homeported at this location; therefore, there are no existing facilities available at NWS Earle to support the homeporting of LCSs, which includes lack of available berthing space. NWS Earle (Earle/Leonardo Pier complex) is along the northern New Jersey shore, at the southern end of Sandy Hook Bay in Monmouth County, New Jersey. Under this alternative, the LCSs would be homeported at NWS Earle. The mission of this installation is to provide support to the U.S. Navy fleet, not homeporting services. As such these facilities are not structured or equipped to support the homeporting of Navy vessels, and, therefore, this alternative is eliminated from further detailed analysis in this EA.

Naval District Washington. Currently, no Navy surface combatant ships are homeported at these locations; therefore, there are no existing facilities available within the Naval District Washington area of operations to support the homeporting of LCSs. Naval District Washington encompasses more than 4,000 square miles, including the District of Columbia, counties in Maryland, and counties in Northern Virginia. In total, the District encompasses 400 commands and activities. Under this alternative, a combination of Naval Support Facility (NSF) Dahlgren, NSF Indian Head, and Naval Air Station (NAS) Patuxent River were considered for homeporting the LCSs and support facilities. The mission of these installations is to provide support to the U.S. Navy fleet, not homeporting services. As such these facilities are not structured or equipped to support the homeporting of Navy vessels, and, therefore, are eliminated from further detailed analysis in this EA.

NWS Yorktown. Currently, no Navy surface combatant ships are homeported at NWS Yorktown; therefore, there are no existing facilities available to support the homeporting of LCSs. NWS Yorktown was only investigated as a possible location for a MMRC in conjunction with the NAVSTA Norfolk Alternative. NWS Yorktown is approximately 30 miles north of NAVSTA Norfolk and is the primary ammunition-handling installation for the South Hampton Roads Region. Several facilities on the installation were affected by a Base Realignment and Closure (BRAC) action that relocated tenants to Carderock by the end of Fiscal Year (FY) 2011. One of these facilities, Building 1346, has an open high bay necessary for interior storage and is considered a suitable candidate for reuse as an MMRC. However, the building would require extensive renovations to administrative and lab areas; heating, ventilation, and air conditioning for the high bay area; and reconfiguration of existing open spaces. A fenced exterior storage area would also need to be constructed along the entrance road to the facility.

Additionally, the piers at NWS Yorktown are used only for ammunition handling and the swapping of mission modules would not be permitted. The mission of this installation is to provide support to the U.S. Navy fleet, not homeporting services. As such these facilities are not structured or equipped to support the homeporting of Navy vessels. Therefore, NWS Yorktown has been eliminated from further detailed analysis in this EA.

NWS Charleston. No facilities at NWS Charleston are available at this time for reuse for LCS support. NWS Charleston was investigated as a possible support location for a single-site MMRC in conjunction with the Mayport Alternative. The Charleston Naval Complex was closed in 1996 as part of BRAC. This sent the 21 ships homeported at Naval Station Charleston to other homeports, disbanded three commands, and relocated four others. As such the facilities at NWS Charleston are not structured or equipped to support the homeporting of Navy vessels and lacks the available facilities to support an MMRC. In addition, NWS Charleston is hundreds of miles from either of the alternatives being considered for homeporting 14 LCSs in this EA; therefore, this alternative was eliminated from further detailed analysis in this EA.

NAS Jacksonville. NAS Jacksonville was investigated as a possible location for MMRC in conjunction with the NAVSTA Mayport Scenario. Local planners indicated that because of ongoing redevelopment of the installation's flight line, existing facilities are unavailable for reuse and no other vacant areas are available for consideration as sites for new construction. This alternative was eliminated from further detailed analysis in this EA.

Naval Ordnance Test Unit (NOTU) Cape Canaveral. NOTU Cape Canaveral was considered as a possible location for an MMRC in conjunction with the NAVSTA Mayport Scenario. Currently, there are no Navy surface combatant ships homeported at this location. As such, this facility is not structured or equipped to support the homeporting of Navy vessels or related support systems. Additionally no existing facilities are available to support the MMRC function at this location. Therefore, this alternative was eliminated from further detailed analysis in this EA.

2.2.4 No Action Alternative

CEQ regulations require consideration of the No Action Alternative. The No Action Alternative does not meet the purpose of and need for the Proposed Action. It does, however, serve as a baseline against which the impacts of the Proposed Action can be evaluated. Under the No Action Alternative, there would be no construction, demolition, modification, or renovations to existing facilities. Up to 14 LCSs would not be homeported at the proposed installations on the East Coast. Additionally, the storage, maintenance, and test flights of Firescouts in support of LCS operations would not occur on the East Coast.

However, the No Action Alternative will be carried forward for detailed analysis to serve as a baseline for comparison of the action alternatives.

2.2.5 Identification of the Preferred Alternative

There are two homeporting alternatives that have been selected for evaluation in this EA: NAVSTA Mayport Alternative 1 (Scenario 1-NAVSTA Mayport and Scenario 2-NSB Kings Bay) and the NAVSTA Norfolk Alternative (Alternative 2). In addition, the Aviation Support Component at MCAS Cherry Point was analyzed as a part of the Proposed Action for both alternatives. The Navy has identified the preferred alternative as the NAVSTA Mayport Alternative (Alternative 1, Scenario 1 – NAVSTA Mayport) for homeporting up to 14 LCSs and the MCAS Cherry Point Component for aviation support.

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3. Affected Environment and Environmental Consequences

This section presents a description of the environmental resources and baseline conditions that could be affected from implementing the Proposed Action. In addition, this section presents an analysis of the potential environmental consequences of implementing the Proposed Action at NAVSTA Mayport (NAVSTA Mayport Scenario), at NAVSTA Mayport and NSB Kings Bay (NSB Kings Bay Scenario) or at NAVSTA Norfolk (NAVSTA Norfolk Alternative), and the consequences of selecting the No Action Alternative.

Affected Environment. All potentially relevant environmental resource areas were initially considered for analysis in this EA. In compliance with NEPA, CEQ, and 32 CFR § 775 guidelines, the discussion of the affected environment focuses only on those resource areas potentially subject to impacts, and those with potentially significant environmental issues. This section includes noise, air quality, human health and safety, coastal zone management, geological resources, biological resources, water resources, socioeconomics (including environmental justice and environmental health and safety risks to children), infrastructure (including transportation), hazardous materials and wastes, and cultural resources.

Environmental resource areas that are often analyzed in an EA but were not included in this analysis includes visual and aesthetic resources and land use. The Proposed Action does not involve any activities that would significantly alter the aesthetic qualities of the area or landscape. The Proposed Action would be consistent with the current characteristic features of the area and landscape. Accordingly, the Navy has not included a detailed examination of visual and aesthetic resources or land use in this EA.

The Proposed Action would occur entirely within the installation boundaries at NAVSTA Mayport, NSB Kings Bay, NAVSTA Norfolk, and MCAS Cherry Point. It does not include new construction or any other activities that would result in a land use change. Flights at MCAS Cherry Point would occur using existing flight tracks and airspace and there would be no compatible land use conflicts off of the installation. Accordingly, the Navy has not included a detailed examination of land use in this EA.

There are some environmental resources that are analyzed in an EA but are not discussed in detail under the NSB Kings Bay Scenario. Under this scenario, the homeporting of LCSs would occur at NAVSTA Mayport, which is analyzed under the NAVSTA Mayport Scenario. The component of the Proposed Action that does not have a detailed discussion includes the proposed MMRC at NSB Kings Bay and the additional 30 personnel that would be required to support the MMRC. This scenario would not require construction or ground-disturbing activities at NSB Kings Bay; therefore, no impacts are anticipated on the following resource areas: land use and coastal zone management, geological resources, biological resources, water resources, and utilities, infrastructure, and transportation.

Navy vessel transit activities, which include in-port operations, were analyzed in the Navy's Virginia Capes, Cherry Point, and Jacksonville EIS, dated June 2009. LCS training and transits in and out of port (i.e., 0 to 3 nautical miles [0 to 5.6 km] from the shoreline), including training and transits in and out of each bay; training and testing, involving the use of sonar; pierside sonar maintenance and testing; and the use of active sonar by the LCSs are currently being addressed in the *Atlantic Fleet Training and Testing Environmental Impact Statement* that is being developed by the Navy to provide continuing coverage for vessel transits and training beginning in 2014.

This section presents an analysis of the potential direct and indirect effects of each alternative on the affected environment. The following discussion elaborates on the nature of the characteristics that might relate to resources. "Significantly," as used in NEPA, requires considerations of both context and intensity. Context means that the significance of an action must be analyzed in several contexts such as society as a whole (e.g., human, national), the affected region, the affected interests, and the locality.

Significance varies with the setting of a proposed action. For instance, in the case of a site-specific action, significance would usually depend on the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant (40 CFR § 1508.27).

Intensity refers to the severity of impact. The following should be considered in evaluating intensity (40 CFR § 1508.27):

- Impacts that might be both beneficial and adverse. A significant effect might exist even if the Federal agency believes that on balance the effect will be beneficial.
- The degree to which a proposed action affects public health or safety.
- Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.
- The degree to which the effects on the quality of the human environment are likely to be highly controversial.
- The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.
- The degree to which the action could establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.
- Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.
- The degree to which the action could adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places (NRHP) or could cause loss or destruction of significant scientific, cultural, or historical resources.
- The degree to which the action could adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act (ESA).
- Whether the action threatens a violation of Federal, state, or local law or requirements imposed for the protection of the environment.

3.1 Noise

3.1.1 Definitions

Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Human response to increased sound levels varies according to the source type, characteristics of the sound source, distance between source and receptor, receptor sensitivity, and time of day. Affected sensitive receptors are specific (e.g., schools, churches, or hospitals) or broad (e.g., nature preserves or designated districts) areas in which occasional or persistent sensitivity to noise above ambient levels exists.

Noise Metrics and Regulations

Noise Metrics and Regulations. Although human response to noise varies, measurements can be calculated with instruments that record instantaneous sound levels in decibels. A-weighted decibel (dBA) is used to characterize sound levels that can be sensed by the human ear. "A-weighted" denotes the adjustment of the frequency range to what the average human ear can sense when experiencing an audible

event. The threshold of audibility is generally within the range of 10 to 25 dBA for normal hearing. The upper boundary of audibility is normally in the region of 135 dBA and can be painfully loud (USEPA 1981a). **Table 3-1** compares common sounds and shows how they rank in terms of the effects of hearing. As shown, a whisper is normally 30 dBA and considered to be very quiet while an air conditioning unit 20 feet away is considered an intrusive noise at 60 dBA. Noise levels can become annoying at 80 dBA and very annoying at 90 dBA. To the human ear, each 10 dBA increase seems twice as loud (USEPA 1981b).

Table 3-1. Sound Levels and Human Response

Noise Level (dBA)	Common Sounds	Effect
10	Just audible	Negligible
30	Soft whisper (15 feet)	Very quiet
50	Light auto traffic (100 feet)	Quiet
60	Air conditioning unit (20 feet)	Intrusive
70	Noisy restaurant or freeway traffic	Telephone use difficult
80	Alarm clock (2 feet)	Annoying
90	Heavy truck (50 feet) or city traffic	Very annoying Hearing damage (8 hours)
100	Garbage truck	Very annoying
110	Pile drivers	Strained vocal effort*
120	Jet takeoff (200 feet) or auto horn (3 feet)	Maximum vocal effort
140	Carrier deck jet operation	Painfully loud

Source: USEPA 1981b

Note: * HDR extrapolation

Construction Sound Levels. Building construction and demolition activities can cause an increase in sound that is well above the ambient level. A variety of sounds are emitted from loaders, trucks, saws, and other work equipment. **Table 3-2** lists noise levels associated with common types of construction equipment. Construction equipment usually exceeds the ambient sound levels by 20 to 25 dBA in an urban environment and up to 30 to 35 dBA in a quiet suburban area.

Table 3-2. Predicted Noise Levels for Construction Equipment

Construction Equipment	Predicted Noise Level at 50 feet (dBA)
Backhoe	72–93
Concrete mixer	74–88
Crane	75–87
Front loader	72–83
Grader	80–93
Jackhammer	81–98
Paver	86–88
Pile driver	95–105
Roller	73–75
Truck	83–94

Source: USEPA 1981a

3.1.2 Existing Conditions

3.1.2.1 NAVSTA Mayport Alternative

Scenario 1 – NAVSTA Mayport

The ambient noise environment at NAVSTA Mayport includes natural sources (e.g., wind, waves, birds) and artificial sources (e.g., aircraft, vehicles, ships, horns). Major roadways in the area include Highway 101 and 116 to the southwest of the installation. Some of the facilities at NAVSTA Mayport include bachelor quarters, medical and dental clinic, a child development center, recreational vehicle park, and family housing (Navy 2008). Considering the military aircraft and ship operations, and vehicle traffic at and adjacent to NAVSTA Mayport, the ambient sound environment would resemble an urban atmosphere.

Scenario 2 – NAVSTA Mayport-NSB Kings Bay

The ambient noise environment at NSB Kings Bay is similar to that described for NAVSTA Mayport. Artificial sources of airborne noise at NSB Kings Bay include rotary-wing aircraft and an audio mass notification system for routine and emergency announcements.

3.1.2.2 NAVSTA Norfolk Alternative

The ambient noise environment at NAVSTA Norfolk is affected primarily by military aircraft operations, military ship operations, and automobile traffic. Associated with NAVSTA Norfolk is Chambers Field, which is the airfield and includes flight operations such as takeoffs, landings, and training patterns for a number of fixed-wing and helicopter squadrons. Major roadways in the area include Interstate- (I) 564, I-64, and Hampton Boulevard (Navy 2009d). Considering the military aircraft and ship operations, and vehicle traffic at and adjacent to NAVSTA Norfolk and the Hampton Roads Area, the ambient sound environment would resemble an urban atmosphere at a Navy installation.

3.1.2.3 MCAS Cherry Point

The primary source of noise at MCAS Cherry Point is from aircraft operations that include takeoffs, landings, and training patterns. There are also a number of test ranges that produce noise, primarily from aircraft operations and weapons deployment. There are no noise-sensitive receptors in close proximity to the test ranges (NAVFAC LANT 2001). Major roadways surrounding MCAS Cherry Point include I-70 and Highway 101. Considering the military aircraft, ordinance firing activities, and vehicle traffic at and adjacent to MCAS Cherry Point, the ambient sound environment would resemble an urban atmosphere at a Navy installation.

3.1.3 Environmental Consequences

3.1.3.1 NAVSTA Mayport Alternative

Scenario 1 – NAVSTA Mayport

Demolition and Construction Noise. Individual equipment used during construction and demolition activities would be expected to result in noise levels comparable to those shown in **Table 3-3**. In general, noise from construction and demolition activities varies depending on the type of equipment being used, the area that the action would occur in, and the distance from the noise source. To predict how these

activities would impact adjacent populations, noise from the probable equipment was estimated. For example, as shown in **Table 3-2**, construction and demolition (i.e., clearing and grading) usually involves several pieces of equipment (e.g., bulldozers and trucks) that can be used simultaneously. Under the Proposed Action, the noise from equipment, during the busiest day, was estimated to determine the total impact of noise from construction and demolition activities at a given distance. Examples of expected construction and demolition noise during daytime hours at specified distances are shown in **Table 3-3**. These sound levels were estimated by adding the noise from several pieces of equipment and then calculating the decrease in noise levels at various distances from the source of the noise.

Table 3-3. Estimated Noise Levels from Construction and Demolition Activities

Distance from Noise Source (feet)	Estimated Noise Level
50	90–94 dBA
100	84–88 dBA
150	81–85 dBA
200	78–82 dBA
400	72–76 dBA
800	66–70 dBA
1,500	< 64 dBA

The closest off-installation populations would about 6,500 feet away and would be exposed to noise levels of approximately 50 dBA. As shown on **Table 3-1**, levels of 50 dBA are considered quiet. Noise generation would last only for the duration of construction and demolition activities and would occur during normal working hours (i.e., between 7:00 a.m. and 5:00 p.m.). Heavy construction equipment would not be operational during the entire demolition period, which would limit the duration of increased noise levels. Therefore, no significant impact on the environment from noise would be expected under NAVSTA Mayport Scenario.

It is anticipated that construction vehicles would access the construction sites from either Bailey Avenue or Baltimore Street. As shown in **Table 3-2**, noise levels are approximately 83 to 94 dBA from trucks 50 feet away. However, these levels would be temporary since the trucks would be moving through the area. Based on the nature of these impacts, no significant impact on the environment from noise would be expected under NAVSTA Mayport Scenario.

Operational Noise. The primary noise sources for the LCS during normal operations include noise generated by engines; equipment used for cargo- and module-handling activities could produce additional noise. Cargo and module handling would be performed by truck-mounted cranes, small material-handling equipment, or the ship's offboard vehicle launch and recovery system. In general noise from these activities would vary depending on the specific type and number of equipment being used and the distance from the noise source. These handling activities would be similar to, and consistent with, other current installation activities. The noise from the handling equipment would be localized and intermittent during loading and unloading operations, and would only last for the duration of the loading or unloading activities. Based on the nature of these impacts, no significant impact on the environment from noise would be expected.

Under the Proposed Action, there could be an increase of approximately 1,700 personnel and approximately 1,900 additional family members for a total increase of approximately 3,600 people. Conservatively, this could result in potentially 3,600 additional vehicles. Major access roads, such as Mayport Drive/Maine Street, would carry the additional vehicles to and from the installation. Land use along this road includes residential, recreational, and educational facilities. The slight increase in traffic could cause a slight increase in noise levels on those populations. However, given that the additional vehicles would be intermittent and the increase in traffic would include a small percentage of the existing traffic, no significant impacts on the environment from noise would be expected.

Scenario 2 – NAVSTA Mayport-NSB Kings Bay

Renovation Noise. Renovation activities would be similar to, and consistent with, other installation improvement actions at NSB Kings Bay. Renovation activities could involve the use of several pieces of equipment, similar to those described for construction activities at NAVSTA Mayport. **Table 3-3** provides examples of expected total renovation noise during daytime hours at specified distances. Noise generation would last only for the duration of renovation activities and could be minimized through measures such as restricting these activities to normal working hours (i.e., between 7:00 a.m. and 5:00 p.m.), and using equipment with exhaust mufflers. Based on the nature of these impacts, no significant impact on the environment from noise would be expected under NSB Kings Bay Scenario.

As shown in **Table 3-2**, noise levels are approximately 83 to 94 dBA from trucks 50 feet away. These levels would be temporary since the trucks would be moving through the area. The short-term increase in traffic resulting from construction vehicles would not cause significant impacts on the environment from noise.

Operational Noise. Under the NBS King Bay Scenario, the proposed LCSs would be homeported at NAVSTA Mayport. Therefore, noise impacts from the LCSs are discussed in the previous section.

There would be an increase of approximately 30 Navy personnel at NSB Kings Bay and potentially 30 additional vehicles. Existing major access roads would be accessed by the additional vehicles to and from the installation. This increase in traffic would cause a slight increase in noise levels on the surrounding populations. Given that the additional vehicles on NSB Kings Bay would be intermittent and the increase in traffic would be small, no significant impacts on the environment from noise would be expected.

3.1.3.2 NAVSTA Norfolk Alternative

Construction Noise. Individual equipment used during construction activities would be expected to result in noise levels comparable to those shown in **Table 3-2**. Under the Proposed Action, the total noise from equipment, during the busiest day, was estimated to determine the total impact of noise from construction and demolition activities at a given distance. Examples of expected construction and demolition noise during daytime hours at specified distances are shown in **Table 3-3**. These sound levels were estimated by adding the noise from several pieces of equipment and then calculating the decrease in noise levels at various distances from the source of the noise.

The closest off-installation populations would about 5,000 feet away and would be exposed to noise levels of approximately 55 dBA. Noise levels of 50 dBA are considered quiet. Noise generation would last only for the duration of construction and demolition activities and would be minimized through measures such as restricting these activities to normal working hours (i.e., between 7:00 a.m. and 5:00 p.m.), and using equipment with exhaust mufflers. Heavy construction equipment would not be operational during the entire demolition period, which would limit the duration of increased noise levels.

It is anticipated that construction vehicles would access the construction sites from either Admiral Taussig Boulevard or Hampton Boulevard/Maryland Avenue. As shown in **Table 3-2**, noise levels are approximately 83 to 94 dBA from trucks 50 feet away. These levels would be temporary since the trucks would be moving through the area. Based on the nature of these impacts, no significant impact on the environment from noise would be expected under NAVSTA Norfolk Alternative.

Operational Noise. The primary noise sources for the LCS during normal operations include noise generated by engines; equipment used for cargo- and module-handling activities could produce additional noise. Cargo and module handling would be performed by truck-mounted cranes, small material-handling equipment, or the ship's offboard vehicle launch and recovery system. In general, noise from these activities would vary depending on the specific type and number of equipment being used and the distance from the noise source. These handling activities would be similar to, and consistent with, other current installation activities. No noise impacts are currently associated with current routine installation activities. The noise from the handling equipment would be localized and intermittent during loading and unloading operations, and would only last for the duration of the loading or unloading activities. No significant impacts on the ambient noise levels would be anticipated.

Under the Proposed Action, there could be an increase of approximately 1,700 personnel and approximately 1,900 additional family members for a total increase of approximately 3,600 people. Conservatively, this could result in 3,600 additional vehicles. Major access roads, such as Hampton Boulevard, would carry the additional vehicles to and from the installation. Vehicles used by the family members of military personnel would be driven to NAVSTA Norfolk occasionally. In addition, with varying work schedules and deployments, the additional vehicle trips would be intermittent. Given that the additional traffic would be intermittent, and that Hampton Boulevard is a major thoroughfare in the area, no significant impact on the environment from noise would be expected under NAVSTA Norfolk Alternative.

3.1.3.3 MCAS Cherry Point

Construction Noise. The proposed Firescouts would be stored in existing facilities at MCAS Cherry Point. Minor, land-based facility improvements (i.e., renovations) would be required. Noise produced from renovation activities would not be expected to be noticeable, due to the high number of aircraft activities that already occur at MCAS Cherry Point.

Noise from Firescout Operations on the Ground. Noise produced by the Firescout stems from the engine and rotor blades. Noise levels decrease as the aircraft moves farther away.

Typical noise levels from the Firescout while it is on the ground include the following:

- A person standing 50 feet from a single Firescout while it is idling and in full flight power on the ground would be expected to experience noise levels of 80 to 85 dBA and 85 to 90 dBA, respectively.
- A person standing 100 feet from a single Firescout while it is idling and in full flight power on the ground would be expected to experience noise levels of 75 to 80 dBA and 80 to 85 dBA, respectively.
- A person standing 500 feet from a single Firescout while it is idling and in full flight power on the ground would be expected to experience noise levels of approximately 35 to 40 dBA and 40 to 45 dBA, respectively.

No significant impacts on noise-sensitive receptors would be expected from Firescout operations on the ground. At a distance of 500 feet, noise from a Firescout operating at full flight power would be less than the noise level associated with light traffic. At distances greater than 500 feet, noise from Firescouts is not expected to be noticeable, due to the high number of aircraft activities that already occur at MCAS Cherry Point. It is anticipated that the average person would be more than 500 feet from the Firescout while it is being tested, and would not be exposed to noise levels greater than 45 dBA.

Noise from Firescout Test Flights. Firescout test flights would be required to verify that maintenance has been performed properly. The aircraft would not leave local airspace at MCAS Cherry Point. In addition, the aircraft would follow existing flight tracks within existing airspace, and would consist of preprogrammed profiles, similar to those of other manned helicopters and unmanned aerial systems at MCAS Cherry Point. The existing helicopter landing pad at MCAS Cherry Point would be used for Firescout test flights. The test flights would be conducted at altitudes of approximately 500 feet above ground level and would be less than 1 hour (approximately 30 minutes); therefore, up to 15 test flights could be conducted each month for a total of 360 expected test flights per year. The existing noise levels at MCAS Cherry Point are dominated by fixed-wing aircraft (which are louder than the Firescout), the Firescout test flights would not be expected to produce a noticeable change in average noise levels within the areas currently exposed to noise from aircraft operations. Therefore, no significant impacts on the existing noise environment would be expected.

3.1.3.4 No Action Alternative

Under the No Action Alternative, there would be no construction, demolition, modification, or renovations of existing facilities. Up to 14 LCSs would not be homeported at the proposed installations on the East Coast. The No Action Alternative would result in the continuation of existing conditions at the proposed installations as described in **Section 3.1.2**. No direct changes in environmental effects would be expected on the ambient noise environment.

3.2 Air Quality

3.2.1 Definitions

In accordance with Federal Clean Air Act (CAA) requirements, the air quality in a given region or area is measured by the concentration of criteria pollutants in the atmosphere. The air quality in a region is a result of not only the types and quantities of atmospheric pollutants and pollutant sources in an area, but also surface topography, the size of the topological "air basin," and the prevailing meteorological conditions.

Ambient Air Quality Standards. Under the CAA, the U.S. Environmental Protection Agency (USEPA) developed numerical concentration-based standards, or National Ambient Air Quality Standards (NAAQS), for pollutants that have been determined to affect human health and the environment. The NAAQS represent the maximum allowable concentrations for ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable particulate matter (including particulate matter equal to or less than 10 microns in diameter [PM_{10}] and particulate matter equal to or less than 2.5 microns in diameter [$PM_{2.5}$]), and lead (Pb) (40 CFR Part 50). The CAA also gives the authority to states to establish air quality rules and regulations. The states of Florida, Georgia, and Virginia have adopted the NAAQS and promulgated some additional State Ambient Air Quality Standards (SAAQS) for criteria pollutants. In some cases, the SAAQS are more stringent than the Federal primary standards. **Table 3-4** presents the NAAQS and SAAQS for federally listed criteria pollutants.

Table 3-4. National and State Ambient Air Quality Standards, Effective October 2011

Pollutant	Averaging Time	Primary Standard					Secondary Standard
		Federal	Florida	Georgia	Virginia	North Carolina	
CO	8-hour [1]	9 ppm (10 mg/m^3)	Same as Federal	Same as Federal	Same as Federal	Same as Federal	None
	1-hour [1]	35 ppm (40 mg/m^3)	Same as Federal	Same as Federal	Same as Federal	Same as Federal	None
Pb	Rolling 3-Month Average [2]	0.15 µg/m^3 [3]	None	Same as Federal	Same as Federal	None	Same as Primary
	Quarterly Average	1.5 µg/m^3 [3]	Same as Federal	None	Same as Federal	Same as Federal	Same as Primary
NO_2	Annual [4]	53 ppb [5]	50 ppb	Same as Federal	Same as Federal	Same as Federal	Same as Primary
	1-hour [6]	100 ppb	None	Same as Federal	Same as Federal	Same as Federal	None
PM_{10}	Annual (Arithmetic Mean)	None	50 µg/m^3	None	None	None	None
	24-hour [7]	150 µg/m^3	Same as Federal	Same as Federal	Same as Federal	Same as Federal	Same as Primary
$PM_{2.5}$	Annual [8]	15 µg/m^3	None	Same as Federal	Same as Federal	Same as Federal	Same as Primary
	24-hour [6]	35 µg/m^3	None	Same as Federal	Same as Federal	Same as Federal	Same as Primary
O_3	8-hour [9]	0.075 ppm [10]	None	Same as Federal	Same as Federal	Same as Federal	Same as Primary
	1-hour (Daily Maximum)	None	0.12 ppm (235 mg/m^3)	None	0.12 ppm (235 g/m^3)	None	None
SO_2	1-hour [11]	75 ppb [12]	None	Same as Federal	Same as Federal	None	None
	Annual (Arithmetic Average)	0.03 ppm (80 µg/m^3)	60 µg/m^3	Same as Federal	Same as Federal	Same as Federal	None
	24-hour	0.14 ppm (365 µg/m^3)	260 µg/m^3	Same as Federal	Same as Federal	Same as Federal	None

Pollutant	Averaging Time	Primary Standard					Secondary Standard
		Federal	Florida	Georgia	Virginia	North Carolina	
SO_2 (cont'd.)	3-hour (1)	None	1,300 µg/m^3	None	None	None	0.5 ppm (1300 µg/m^3)

Sources: USEPA 2012a, FDEP 2012, GDNR 2011, VA SAPCB 2011

Notes: Parenthetical values are approximate equivalent concentrations.

1. Not to be exceeded more than once per year.
2. Not to be exceeded.
3. Final rule signed 15 October 2008. The 1978 lead standard (1.5 µg/m^3 as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved. USEPA designated areas for the new 2008 standard on November 8, 2011.
4. Annual mean.
5. The official level of the annual NO_2 standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of cleaner comparison to the 1-hour standard.
6. 98th percentile, averaged over 3 years.
7. Not to be exceeded more than once per year on average over 3 years.
8. Annual mean, averaged over 3 years.
9. Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years.
10. Final rule signed 12 March 2008. The 1997 ozone standard (0.08 ppm, annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years) and related implementation rules remain in place. In 1997, USEPA revoked the 1-hour ozone standard (0.12 ppm, not to be exceeded more than once per year) in all areas, although some areas have continued obligations under that standard ("anti-backsliding"). The 1-hour ozone standard is attained when the expected number of days/calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to 1.
11. 99^{th} percentile of 1-hour daily maximum concentrations, averaged over 3 years.
12. Final rule signed 2 June 2010. The 1971 annual (0.3 ppm) and 24-hour (0.14 ppm) SO_2 standards were revoked in that same rulemaking. However, these standards remain in effect until one year after an area is designated for the 2010 standard, except in areas designated nonattainment for the 1971 standards, where the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standard are approved. USEPA expects to designate areas for the new 2010 standard by 2 June 2012.

Key: ppm = parts per million; ppb = parts per billion; mg/m^3 = milligrams per cubic meter; µg/m^3 = micrograms per cubic meter

Attainment Versus Nonattainment and General Conformity. The USEPA classifies the air quality in an air quality control region (AQCR), or in subareas of an AQCR, according to whether the concentrations of criteria pollutants in ambient air exceed the NAAQS. Areas within each AQCR are therefore designated as either "attainment," "nonattainment," "maintenance," or "unclassified" for each of the six criteria pollutants. Attainment means that the air quality within an AQCR is better than the NAAQS; nonattainment indicates that criteria pollutant levels exceed NAAQS; maintenance indicates that an area was previously designated nonattainment but is now attainment; and an unclassified air quality designation by USEPA means that there is not enough information to appropriately classify an AQCR, so the area is considered attainment.

Federal Prevention of Significant Deterioration. Federal Prevention of Significant Deterioration regulations apply in attainment areas to a major stationary source, (i.e., source with the potential to emit 250 tons per year [tpy] of any criteria pollutant), and a significant modification to a major stationary source, (i.e., change that adds 10 to 40 tpy to the facility's potential to emit depending on the pollutant).

Additional Prevention of Significant Deterioration major source and significant modification thresholds apply for greenhouse gases (GHGs), as discussed in the Greenhouse Gas Emissions subsection. Prevention of Significant Deterioration permitting can also apply to a proposed project if all three of the following conditions exist: (1) the proposed project is a modification with a net emissions increase to an

existing Prevention of Significant Deterioration major source, (2) the proposed project is within 10 kilometers of national parks or wilderness areas (i.e., Class I Areas), and (3) regulated stationary source pollutant emissions would cause an increase in the 24-hour average concentration of any regulated pollutant in the Class I area of 1 milligram per cubic meter (mg/m^3) or more (40 CFR 52.21[b][23][iii]). A Class I area includes national parks larger than 6,000 acres, national wilderness areas and national memorial parks larger than 5,000 acres, and international parks. Prevention of Significant Deterioration regulations also define ambient air increments, limiting the allowable increases to any area's baseline air contaminant concentrations, based on the area's Class designation (40 CFR 52.21[c]).

For purposes of this analysis, 250 tpy per pollutant was used as a comparative threshold to trigger further evaluation of potential air quality impacts from criteria pollutants for which the area is in attainment. This threshold is used by the USEPA in their New Source Review standards as an indicator for impact analysis for listed new major stationary sources in attainment areas. In following this standard, any major new stationary sources that exceed 250 tpy for any listed pollutant must conduct further analysis to demonstrate that these impacts would not cause a substantial degradation of air quality regulations. In nonattainment and maintenance areas, mobile source emissions of nonattainment and maintenance pollutants are included when comparing the total emissions increase to the General Conformity *de minimis* levels. Although the 250 tpy value only applies to stationary sources under the regulations, it is being applied here as a conservative measure of potential impacts from stationary plus mobile sources in attainment areas to give the reader a sense of the extent of the impacts.

Title V Requirements. A Title V major stationary source has the potential to emit more than 100 tpy of any one criteria air pollutant, 10 tpy of a hazardous air pollutant, or 25 tpy of any combination of hazardous air pollutants. The purpose of the permitting rule is to establish regulatory control over large, industrial-type activities and monitor their impact on air quality.

Greenhouse Gas Emissions. GHGs are primarily produced by the burning of fossil fuels and through industrial and biological processes. On 22 September 2009, the USEPA issued a final rule for mandatory GHG reporting from large GHG stationary emissions sources in the United States. The purpose of the rule is to collect comprehensive and accurate data on carbon dioxide (CO_2) and other GHG emissions that can be used to inform future policy decisions. In general, the threshold for reporting is 25,000 metric tons (27,557.8 short tons) or more of CO_2 equivalent (CO_2e) emissions per year, excluding mobile source emissions.

3.2.2 Existing Conditions

3.2.2.1 NAVSTA Mayport Alternative

Scenario 1 – NAVSTA Mayport

NAVSTA Mayport is located in Duval County, Florida, which is within the Jacksonville-Brunswick Interstate AQCR. This AQCR also includes Alachua, Baker, Bradford, Clay, Columbia, Dixie, Flagler, Franklin, Gadsden, Gilchrist, Hamilton, Jefferson, Lafayette, Leon, Liberty, Madison, Marion, Massau, St. Johns, Suwannee, Taylor, Union, and Wakulla counties in Florida; and Appling, Atkinson, Bacon, Brantley, Camden, Charlton, Cling, Coffee, Glynn, Long, McIntosh, Pierce, Ware, and Wayne counties in Georgia (USEPA 2002a). All counties in the Jacksonville-Brunswick Interstate AQCR are in attainment for all criteria pollutants (USEPA 2011a). According to 40 CFR Part 81.407, no Class I areas are located within 10 km of NAVSTA Mayport (USEPA 2002b).

The most recent emissions for Duval County and the Jacksonville-Brunswick Interstate AQCR are shown in **Table 3-5**. Duval County is considered the local area of influence and the Jacksonville-Brunswick Interstate AQCR is the regional area of influence for this air quality analysis at NAVSTA Mayport. O_3 is not a direct emission; it is generated from reactions of volatile organic compounds (VOCs) and nitrogen oxides (NO_x), which are precursors to O_3. Therefore, for the purposes of this air quality analysis, VOCs and NO_x emissions are used to represent O_3 generation.

Table 3-5. Local and Regional Air Emissions Inventory (2008) for NAVSTA Mayport and NSB Kings Bay

	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Duval County	47,728	31,521	80,406	18,414	10,148	4,510
Camden County	1,626	17,784	9,144	45	3,023	555
Jacksonville-Brunswick Interstate AQCR	160,320	731,022	669,805	63,831	143,545	51,197

Source: USEPA 2008a

The Florida Department of Environmental Protection, Division of Air Resource Management regulates air quality for the State of Florida. The City of Jacksonville's Regulatory and Environmental Services Department, Air Quality Branch, further regulates the Jacksonville/Duval County local air quality. NAVSTA Mayport maintains a Title V permit and is classified as a Title V source because potential emissions of one or more individual criteria pollutants are equal to or greater than 100 tpy. NAVSTA Mayport is further classified as a synthetic minor source, (i.e., Non-Title V source) for hazardous air pollutants because the potential emissions of any single hazardous air pollutant is limited to less than 10 tpy and the potential emissions of total hazardous air pollutants is limited to less than 25 tpy. There are various sources on installation that emit criteria pollutants and hazardous air pollutants, including boilers, abrasive blast booths, and surface coating operations (Navy 2011d). **Table 3-6** summarizes the calendar year 2011 air emissions inventory (i.e., actual emissions) for NAVSTA Mayport.

Table 3-6. Calendar Year 2011 Air Emissions Inventory for NAVSTA Mayport

	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_x (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
2011 Actual Emissions	2.10	39.79	1.28	0.23	0.22	NA*

Source: Navy 2012h

Note: * In accordance with NAVSTA Mayport's Title V Permit, particulate matter emissions are only regulated and measured as PM_{10}

Scenario 2 – NAVSTA Mayport-NSB Kings Bay

NSB Kings Bay is located in Camden County Georgia, and is also within the Jacksonville-Brunswick Interstate AQCR. As previously described, this AQCR is in attainment for all criteria pollutants. In addition, there are no Class I areas within 10 kilometers of NSB Kings Bay (USEPA 2002c). **Table 3-5** includes the recent emissions for Jacksonville-Brunswick Interstate AQCR and Camden County, Georgia.

The Georgia Department of Natural Resources, Environmental Protection Division, Air Protection Branch regulates air quality for the State of Georgia. NSB Kings Bay is classified as a Title V and Prevention of

Significant Deterioration major source by the Georgia Department of Natural Resources because the installation has the potential to emit NO_x and SO_2 above 250 tpy and is located in an attainment area. NSB Kings Bay maintains a Title V permit. Installation sources of criteria pollutants and hazardous air pollutants include boilers, generators (emergency and non-emergency), and surface-coating operations (Navy 2011e). While the current Title V permit allows for the burning of up to 0.5 percent sulfur in facility boilers, NSB Kings Bay only uses 15 parts per million (ppm) sulfur fuel due to regulations for onsite generators. This limits the potential to emit SO_2 to approximately 2.4 tpy (Fleck 2012).

3.2.2.2 NAVSTA Norfolk Alternative

NAVSTA Norfolk is located in the City of Norfolk, which is within the Hampton Roads Interstate AQCR. This AQCR also includes Isle of Wight, James City, Southampton, and York counties; and the cities of Chesapeake, Franklin, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg in Virginia (USEPA 2002d). All counties and cities within the Hampton Roads Interstate AQCR are in attainment for all criteria pollutants; with the exception of the counties of Isle of Wight, James City County, and York; and the cities of Chesapeake, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg, which are designated as Maintenance Areas for the 8-hour O_3 standard (USEPA 2012b). According to 40 CFR Part 81.433, no Class I areas are located within 10 km of NAVSTA Norfolk (40 CFR).

Emissions for the City of Norfolk, the local area of influence, and the Hampton Roads Interstate AQCR, the regional area of influence, are listed in **Table 3-7**.

Table 3-7. Local and Regional Air Emissions Inventory (2008) for NAVSTA Norfolk

	NO_x (tpy)	**VOC (tpy)**	**CO (tpy)**	**SO_2 (tpy)**	**PM_{10} (tpy)**	**$PM_{2.5}$ (tpy)**
City of Norfolk	10,191	3,126	14,795	1,458	1,615	940
Hampton Roads Interstate AQCR	54,400	64,663	150,912	56,209	18,946	8,429

Source: USEPA 2008a

The Virginia Department of Environmental Quality, Air Division regulates air quality for the Commonwealth of Virginia. NAVSTA Norfolk is classified as a major source with the Virginia Department of Environmental Quality and maintains a Title V permit. The sources of criteria pollutants that are found on NAVSTA Norfolk include external combustion units (boilers), internal combustion engines (emergency generators), surface-coating operations, abrasive blasting, and woodworking shops. **Table 3-8** lists the air emissions inventory for NAVSTA Norfolk in calendar year 2011.

Table 3-8. Calendar Year 2011 Air Emissions Inventory for NAVSTA Norfolk

	NO_x (tpy)	**VOC (tpy)**	**CO (tpy)**	**SO_x (tpy)**	**PM_{10} (tpy)**	**$PM_{2.5}$ (tpy)**
2011 Actual Emissions	149	98	84	72	23	3

Source: VDEQ 2011

3.2.2.3 MCAS Cherry Point

MCAS Cherry Point is located in Craven County, North Carolina, which is part of the Southern Coastal Plain Interstate AQCR. This AQCR also includes Brunswick, Carteret, Columbus, Duplin, Greene, Jones, Lenoir, New Hanover, Onslow, Pamlico, Pender, and Wayne counties (USEPA 2002e). The Southern Coastal Plain Intrastate AQCR and specifically Craven County are in attainment for all criteria pollutants. MCAS Cherry Point is within 10 km of the Croatan National Forest; however, according to 40 CFR Part 81.422, it is not a Class I area. There are no Class I areas within 10 km of MCAS Cherry Point (40 CFR Part 81.422).

Table 3-9 includes the recent emissions for Southern Coastal Plain Intrastate AQCR and Craven County, North Carolina.

Table 3-9. Local and Regional Air Emissions Inventory (2008) for MCAS Cherry Point

	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Craven County	5,001	18,833	31,702	1,951	3,388	1,334
Southern Coastal Plain Interstate AQCR	57,023	206,374	365,444	51,616	43,440	16,630

Source: USEPA 2008a

The North Carolina Department of Environmental and Natural Resources, Division of Air Quality, regulates air quality for the State of North Carolina. MCAS Cherry Point currently maintains a Title V permit that requires the facility to perform monitoring, record keeping, and reporting for more than 100 different stationary emissions sources, such as boilers, generators, surface-coating operations, and engine testing operations (NCDENR 2011).

3.2.3 Environmental Consequences

The environmental consequences to local and regional air quality conditions near a proposed Federal action are determined based upon the increases or decreases in regulated air pollutant emissions, and upon existing conditions and ambient air quality. The evaluation criteria are dependent on whether the Proposed Action is located in an attainment, nonattainment, or maintenance area for criteria pollutants.

Attainment Area Pollutants. The attainment area pollutants for the location of this Proposed Action are CO, NO_2 (measured as NO_x) SO_2, Pb, PM_{10}, $PM_{2.5}$, and O_3 (measured as NO_x and VOCs) is also an attainment area pollutant for all areas; however, NAVSTA Norfolk is located in a Maintenance area for the 8-hour O_3 standard.

Prevention of Significant Deterioration requirements would not apply to the Proposed Action because no increases in stationary source potential emissions would be expected. Air quality impacts would require further analysis if emissions would (1) increase ambient air pollution concentrations above the NAAQS; (2) contribute to an existing violation of the NAAQS; (3) interfere with, or delay timely attainment of, the NAAQS; (4) impair visibility within federally mandated Prevention of Significant Deterioration Class I areas; or (5) result in the potential for any new stationary sources to be considered major sources of emissions, as defined in 40 CFR § 52.21 and 40 CFR § 51.165: total emissions of any pollutant subject to regulation under the CAA that are greater than 250 tpy for attainment areas and 100 tpy or less for nonattainment areas, depending on the severity of nonattainment.

For purposes of this analysis, 250 tpy per pollutant was used to consider further evaluation of potential air quality impacts from criteria pollutants for which the area is in attainment. This value is used by the USEPA in their New Source Review standards as an indicator for impact analysis for listed new major stationary sources in attainment areas. In following this standard, any major new stationary sources that exceed 250 tpy for any listed pollutant must conduct further analysis to demonstrate that these impacts would not cause a substantial degradation of air quality under Prevention of Significant Deterioration regulations. In nonattainment and maintenance areas, mobile source emissions of nonattainment and maintenance pollutants are included towards a comparison of the total emissions increase to the General Conformity *de minimis* levels.

Although the 250 tpy value only applies to stationary sources under the regulations, it is being applied here as a conservative measure of potential impacts from stationary plus mobile sources in attainment areas to give the reader a sense of the extent of the impacts. The rationale for this conservative value is that it is consistent with the limit for a Prevention of Significant Deterioration major source in attainment areas.

Nonattainment or Maintenance Area Pollutants. There are no nonattainment area pollutants for the locations of this Proposed Action; however, O_3 is a maintenance area pollutant in the area where NAVSTA Norfolk is located. For Federal actions in nonattainment or maintenance areas, the General Conformity Rule applies. **Table 3-10** presents the General Conformity *de minimis* levels, by regulated pollutant. As shown in this table, *de minimis* levels vary depending on the severity of the nonattainment area classification.

Methodology. Impacts on air quality would result from gaseous and particulate emissions caused by construction equipment and other vehicles. Detailed lists of construction equipment, the anticipated construction schedule, and emission calculations are provided in **Appendix B**. The analysis of air quality impacts of the alternatives was based on equipment specifications and planning estimates for the various construction activities as detailed in the appendix.

Emissions calculations were performed using the most recent emissions factors published in the USEPA's AP-42, Compilation of Air Pollutant Emission Factors. Additional emissions factors were modeled using USEPA's MOBILE6.2 Mobile Vehicle Emissions Factor Model. References for various emissions factors used in the analysis are included in the reference list that accompanies **Appendix B**.

Although the actual construction timeline has not been detailed, conservative analysis was performed assuming all construction activities would occur within one calendar year. However, construction could be distributed over a longer period if work stoppages are required as a result of inclement weather or other factors. Extending the schedule would not affect the air quality analysis because the applicable thresholds are based on annual emissions (tpy). For the purposes of general conformity applicability analysis, conservative estimation methodology assumes continuous construction, whereby the maximum emissions rate would occur during an uninterrupted period of construction. Construction for the Proposed Action would not likely be continuous; therefore, the analysis of air quality impacts is a conservative scenario.

Table 3-10. Conformity *de minimis* Emissions Levels

Pollutant	Status	Classification*	*de minimis* Limit (tpy)
Ozone (measured as NO_x or VOCs)	Nonattainment	Extreme Severe Serious Moderate/marginal (inside ozone transport region) All others	10 25 50 50 (VOCs)/100 (NO_x) 100
	Maintenance	Inside ozone transport region Outside ozone transport region	50 (VOCs)/100 (NO_x) 100
CO	Nonattainment/ maintenance	All	100
PM_{10}	Nonattainment	Serious Moderate No Special Classification	70 100 100
	Maintenance	All	100
$PM_{2.5}$ (measured directly, or as SO_2, or NO_x, or VOC as significant precursors)	Nonattainment/ maintenance	All	100
SO_2	Nonattainment/ maintenance	All	100
NO_x	Nonattainment/ maintenance	All	100
VOC	Nonattainment/ maintenance	All	100
Pb	Nonattainment/ maintenance	All	25

Source: 40 CFR 93.153, as of January 9, 2012

Note: * All refers to every level of classification; including, but not limited to, extreme severe, serious, and moderate/ marginal. No matter the level of classification, the *de minimis* limit is the same.

3.2.3.1 NAVSTA Mayport Alternative

Scenario 1 – NAVSTA Mayport

Construction and Demolition Emissions. It is not expected that emissions from the demolition of Buildings 261, 1393, 1394, and 1263, and Tennis Courts (1364 and 1437) would contribute to or affect local or regional attainment status with the NAAQS. The exact schedule for construction of the proposed facilities is not known; however, as a conservative analysis, **Table 3-11** lists emissions for construction of all facilities in one calendar year. Emissions calculation spreadsheets and a summary of the methodology used are included in **Appendix B**.

No significant impacts from construction and demolition activities (e.g., site-disturbing activities and operation of construction and demolition equipment) would be expected on local and regional air quality under NAVSTA Mayport Scenario. Anticipated demolition and construction emissions would represent a negligible percentage of the air emissions inventoried locally in Duval and Camden counties and within

the Jacksonville-Brunswick Interstate AQCR. Appropriate fugitive dust-control measures would be employed during these activities to suppress emissions. Emissions associated with construction and demolition operations would be temporary in nature.

Table 3-11. Estimated Air Emissions Resulting from NAVSTA Mayport Scenario Demolition and Construction Activities

Activity	NO_x tpy	VOC tpy	CO tpy	SO_2 tpy	PM_{10} tpy	$PM_{2.5}$ tpy
Demolition Activities	2.10	0.29	1.80	0.17	2.93	0.43
Construct LTF	6.17	1.66	6.72	0.48	4.72	1.02
Construct LSF	6.14	1.41	5.90	0.48	9.73	1.47
Construct MMRC	2.65	0.51	2.04	0.21	0.74	0.26
Total Demolition and Construction Emissions	**17.06**	**3.87**	**16.46**	**1.34**	**18.12**	**3.18**

Operational Emissions. Port operations for LCSs would be similar to, and consistent with, other current installation activities. NAVSTA Mayport has established measures and programs for the management of port operations to ensure they are conducted in compliance with Federal and state environmental laws and regulations. It is anticipated that there would be no change in existing port operations under the NAVSTA Mayport Scenario, as support operations and other ship-related services are already in operation. Therefore, port operations, including potential emissions from cranes and other pierside mission-support equipment and stationary sources, would not result in impacts on local or regional air quality.

As previously discussed, there would be an increase of approximately 1,700 personnel under the Proposed Action. For the purpose of this analysis, it is assumed that the additional personnel and their family members (for a total of approximately 3,600 people) would obtain off-installation housing in the surrounding area. Therefore, it is assumed that the personnel would be commuting to and from NAVSTA Mayport at an average round-trip commuting distance of 25 miles. It is anticipated that not all of these vehicles would be driven to the installation at the same time, the vehicles of the proposed family members would be driven on the installation occasionally, and the additional vehicles would represent a small percentage of the existing traffic. **Table 3-12** lists the annual estimated emissions from the additional personnel at NAVSTA Mayport (1,700) and approximately 900 additional vehicles for family members. Anticipated commuting emissions would represent a small percentage of the air emissions inventoried locally in Duval and Camden counties and within the Jacksonville-Brunswick Interstate AQCR. No significant impacts from the additional emissions from vehicles commuting to and from NAVSTA Mayport would be expected.

Table 3-12. Estimated Air Emissions Resulting from NAVSTA Mayport Scenario Operational Activities

Activity	NO_x tpy	VOC tpy	CO tpy	SO_2 tpy	PM_{10} tpy	$PM_{2.5}$ tpy
LCS Personnel Commuting	5.78	6.06	57.62	0.09	0.74	0.47
Total Operational Emissions	**5.78**	**6.06**	**57.62**	**0.09**	**0.74**	**0.47**

As demonstrated, the combined emissions from construction, operations, and commuting from the NAVSTA Mayport Scenario are from mobile sources that do not have applicable regulatory criteria. However, for comparison purposes, these combined emissions are below the USEPA's stationary source criteria of 250 tpy under the Prevention of Significant Deterioration program and they are not expected to cause or contribute to a violation of any NAAQS or SAAQS. Based on the nature of these impacts, no significant impact on air quality would be expected under NAVSTA Mayport Scenario.

The location of the Proposed Action is under the jurisdiction of the Jacksonville/Duval County local air quality program administered by the Florida Department of Environmental Protection, Division of Air Resource Management and the city of Jacksonville's Regulatory and Environmental Services Department, Air Quality Branch (City of Jacksonville 2013). Duval County is designated as in attainment for all criteria pollutant standards. As of 15 June 2005, the county was not considered a maintenance area for the 1-hour ozone standard. Because the region is currently in attainment, the CAA General Conformity Rule does not apply, and a General Conformity Determination is not required (USEPA 2008b).

Greenhouse Gas Emissions. The Proposed Action would contribute directly to emissions of GHGs from the combustion of fossil fuels. Because CO_2 emissions account for approximately 92 percent of all GHG emissions in the United States, they are used for analyses of GHG emissions in this assessment. The U.S. Department of Energy, Energy Information Administration estimates that in 2009 gross CO_2 emissions in the State of Florida were 227 million metric tons and in 2009 gross CO_2 emissions in the entire United States were 5,425.6 million metric tons (DOE EIA 2011). For construction, demolition, and operational activities, this alternative would represent a slight contribution (less than 0.005 percent) towards statewide GHG inventories and an extremely slight contribution (less than 0.0002 percent) toward national GHG inventories. Therefore, no significant impacts on GHGs would be expected.

Scenario 2 – NAVSTA Mayport-NSB Kings Bay

Construction Emissions. Proposed activities at NSB Kings Bay would use existing facilities. No demolition or construction activities would be required; therefore, no significant impacts on air quality from construction would occur.

Operational Emissions. For the purposes of this analysis, it is assumed that 30 personnel would be assigned to NSB Kings Bay Scenario. **Table 3-13** lists the annual estimated emissions from the additional personnel at NSB Kings Bay. Since the ships would be homeported at NAVSTA Mayport, port operations under NSB Kings Bay Scenario would be the same as described under the NAVSTA Mayport Scenario.

Table 3-13. Estimated Air Emissions Resulting from NSB Kings Bay Scenario Operational Activities

Activity	NO_x tpy	VOC tpy	CO tpy	SO_2 tpy	PM_{10} tpy	$PM_{2.5}$ tpy
LCS Personnel Commuting	0.80	0.08	0.80	0.00	0.01	0.01
Total Operational Emissions	**0.80**	**0.08**	**0.80**	**0.00**	**0.01**	**0.01**

As demonstrated, the total emissions from the NSB Kings Bay Scenario are from mobile sources that do not have applicable regulatory criteria. However, for comparison purposes, these emissions are below the USEPA's stationary source criteria of 250 tpy under the Prevention of Significant Deterioration program and they are not expected to cause or contribute to a violation of any NAAQS and SAAQS. Therefore, no significant impact on air quality would be expected under NSB Kings Bay Scenario.

Greenhouse Gas Emissions. The Proposed Action would contribute directly to emissions of GHGs from the combustion of fossil fuels. Because CO_2 emissions account for approximately 92 percent of all GHG emissions in the United States, they are used for analyses of GHG emissions in this assessment. The U.S. Department of Energy, Energy Information Administration estimates that in 2009 gross CO_2 emissions in the State of Florida were 227 million metric tons and 164.2 million metric tons in the State of Georgia. In 2009, the gross CO_2 emissions in the entire United States were 5,425.6 million metric tons (DOE EIA 2011). For all construction, demolition, and operational activities, NSB Kings Bay Scenario would represent a slight contribution (less than 0.004 percent) towards statewide GHG inventories and an extremely slight contribution (less than 0.0002 percent) toward national GHG inventories. Therefore, no significant impacts on GHGs would be expected.

3.2.3.2 NAVSTA Norfolk Alternative

Construction Emissions. At NAVSTA Norfolk, land-based facilities do not exist for long-term support of the proposed 14 LCSs. The area north of Building Z-309 and south of Morris Street is proposed for construction of the LTF, LSF, and MMRC. No significant impacts would be expected on local and regional air quality during construction activities (e.g., site-disturbing activities and operation of construction equipment). Appropriate fugitive dust-control measures would be employed during construction activities to suppress emissions. All of the emissions associated with construction operations would be temporary in nature. Emissions from the construction of the proposed facilities are summarized in **Table 3-14**. As shown, the total emissions from construction activities would be less than the criteria shown in the last line of the table. Emissions estimation spreadsheets and a summary of methodology used are included in **Appendix B**. No significant effects on air quality would be expected from the proposed construction activities under the NAVSTA Norfolk Alternative.

Table 3-14. Estimated Air Emissions Resulting from NAVSTA Norfolk Alternative Construction Activities

Activity	NO_x tpy	VOC tpy	CO tpy	SO_2 tpy	PM_{10} tpy	$PM_{2.5}$ tpy
LTF	6.17	1.66	6.72	0.48	4.72	1.02
LSF	6.14	1.41	5.90	0.48	9.73	1.47
MMRC	2.65	0.51	2.04	0.21	0.74	0.26
Total Construction Emissions	**14.96**	**3.58**	**14.66**	**1.17**	**15.19**	**2.75**
General Conformity *de minimus* Limits and Other Significance Criteria	**100[a]**	**100[a]**	**NA[b]**	**NA[b]**	**NA[b]**	**NA[b]**

Notes:

a. NO_x and VOC thresholds are General Conformity *de minimis* thresholds for the ozone maintenance area.

b. These attainment pollutants do not have regulatory requirements for General Conformity. These attainment pollutants are well below the threshold of 250 tpy used for major stationary sources under USEPA's Prevention of Significant Deterioration requirements.

Operational Emissions. As previously discussed, there would be an increase of approximately 1,700 personnel and family members (for a total of approximately 3,600 people) under the Proposed Action. **Table 3-15** lists the annual estimated emissions from the additional personnel at NAVSTA Norfolk. As shown, the total operations emissions would be less than the criteria shown in the last line of the table.

Table 3-15. Estimated Air Emissions Resulting from NAVSTA Norfolk Alternative Operational Activities

Activity	NO_x tpy	VOC tpy	CO tpy	SO_2 tpy	PM_{10} tpy	$PM_{2.5}$ tpy
LCS Personnel Commuting	5.78	6.06	57.62	0.09	0.74	0.47
Total Operational Emissions	**5.78**	**6.06**	**57.62**	**0.09**	**0.74**	**0.47**
General Conformity *de minimus* Limits and Other Significance Criteria	**100[a]**	**100[a]**	**NA[b]**	**NA[b]**	**NA[b]**	**NA[b]**

Notes:

a. NO_x and VOC thresholds are General Conformity de minimis thresholds for the ozone maintenance area.

b. These attainment pollutants do not have regulatory requirements for General Conformity. These attainment pollutants are well below the threshold of 250 tpy used for major stationary sources under USEPA's Prevention of Significant Deterioration requirements.

Port operations are anticipated to be similar to, and consistent with, other current installation activities. NAVSTA Norfolk has established measures and programs for the management of port operations to ensure they are conducted in compliance with Federal and state environmental laws and regulations. It is anticipated that there would be no change in existing port operations at NAVSTA Norfolk. Therefore, port operations, including potential emissions from cranes and other pierside mission-support equipment and stationary sources, would not result in impacts on local or regional air quality. Therefore, no significant impacts on air quality would be expected.

As demonstrated, the combined emissions from construction, operations, and commuting under the NAVSTA Norfolk Alternative are below the applicable General Conformity *de minimis* levels. In addition, pollutants from mobile source emissions are not subject to General Conformity and do not have applicable regulatory criteria. However, for comparison purposes, these mobile source emissions are below the USEPA's stationary source criteria of 250 tpy under the Prevention of Significant Deterioration program. Emissions are not expected to cause or contribute to a violation of any national or state ambient air quality standards. Therefore, no significant impacts on air quality would be expected under the NAVSTA Norfolk Alternative.

Greenhouse Gas Emissions. The Proposed Action would contribute directly to emissions of GHGs from the combustion of fossil fuels. The U.S. Department of Energy, Energy Information Administration estimates that in 2009 gross CO_2 emissions in the Commonwealth of Virginia were 106.7 million metric tons and in 2009 the gross CO_2 emissions in the entire United States were 5,425.6 million metric tons (DOE EIA 2011). For all construction, demolition, and operational activities, the NAVSTA Norfolk Alternative would represent a slight contribution (less than 0.008 percent) towards statewide GHG inventories and an extremely slight contribution (less than 0.0002 percent) toward national GHG inventories. Therefore, no significant impacts on GHGs would be expected.

3.2.3.3 MCAS Cherry Point

Construction Emissions. Proposed Firescouts would be stored in existing facilities at MCAS Cherry Point. Since only minor renovation activities would occur, there would be no significant impacts on air quality.

Firescout and Personnel Operational Emissions. Approximately 360 Firescout test flights would be conducted each year, which would equate to approximately 180 hours of flight time each year. The emissions from the test flights would be fuel combustion emissions from the Firescout engine. Due to the lack of available emissions factors for the Firescout engine, emissions were calculated using the USEPA's AP-42 emissions factors for stationary internal combustion engines using diesel fuel (see **Table 3-16**).

Table 3-16. Estimated Air Emissions Resulting from MCAS Cherry Point Operational Activities

Activity	NO_x tpy	VOC tpy	CO tpy	SO_2 tpy	PM_{10} tpy	$PM_{2.5}$ tpy
LCS Personnel Commuters	0.07	0.07	0.66	0.00	0.01	0.01
Firescout Test Flights	1.00	0.08	0.22	0.07	0.07	0.07
Total Operational Emissions	**1.07**	**0.15**	**0.88**	**0.07**	**0.08**	**0.08**

Additional emissions from personnel commuting would be generated by an increase of approximately 30 aircraft-support personnel stationed at MCAS Cherry Point. For the purposes of this analysis, it is assumed that these personnel and their family members would obtain non-Navy housing off-installation. Therefore, it is assumed that the 30 personnel would be commuting to and from MCAS Cherry Point at an average round-trip commuting distance of 25 miles (see **Table 3-16**).

As demonstrated, the combined emissions from commuting and the operation of Firescouts at MCAS Cherry Point are from mobile sources that do not have applicable regulatory criteria. However, for comparison purposes, these emissions are below the USEPA's stationary source criteria of 250 tpy under the Prevention of Significant Deterioration program and they are not expected to cause or contribute to a violation of any NAAQS and SAAQS. Therefore, no significant impact on air quality would be expected from Firescouts at MCAS Cherry Point.

Greenhouse Gas Emissions. The Proposed Action would contribute directly to emissions of GHGs from the combustion of fossil fuels. The U.S. Department of Energy, Energy Information Administration estimates that in 2009 gross CO_2 emissions in North Carolina were 134.1 million metric tons and in 2009 the gross CO_2 emissions in the entire United States were 5,425.6 million metric tons (DOE EIA 2011). The proposed operational activities would represent a slight contribution (less than 0.0008 percent) towards statewide GHG inventories and an extremely slight contribution (less than 0.000002 percent) toward national GHG inventories. Therefore, no significant impacts on GHGs would be expected.

3.2.3.4 No Action Alternative

Under the No Action Alternative, there would be no construction, demolition, modification, or renovations of existing facilities. Up to 14 LCSs would be not homeported at the proposed installations on the East Coast. The No Action Alternative would result in the continuation of existing conditions at the proposed installations as described in **Section 3.2.2**. No direct changes in environmental effects would be expected on the air quality environment.

3.3 Human Health and Safety

Human health and safety includes consideration for any activities, occurrences, or operations that have the potential to affect the safety, well-being, or health of members of the public. The primary goal is to identify and prevent potential accidents or impacts on the general public.

Health and safety for this EA concerns potential impacts resulting from homeporting up to 14 LCSs and the construction, demolition, and renovation activities needed for the required facilities. Primary human health and safety issues identified for the Proposed Action include Hazards of Electromagnetic Radiation to Ordnance (HERO), and Explosive Safety Quantity Distance (ESQD).

3.3.1 Definitions

A safe environment is one in which there is no, or optimally reduced, potential for death, serious bodily injury or illness, or property damage. Human health and safety addresses public safety during construction, demolition, and renovation activities; and during subsequent operations of those facilities. Various stressors in the environment can affect human health and safety. Identification and control or elimination of these stressors can reduce risks to health and safety to acceptable levels or eliminate risk entirely.

Contaminated Materials. Contaminated materials commonly found at Navy installations include asbestos, lead, 8-Resource Conservation and Recovery Act (RCRA) metals, and polychlorinated biphenyls (PCBs). Metals that are included in the 8-RCRA are arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. Asbestos is regulated by USEPA. Identification of asbestos-containing materials (ACMs) in installation facilities is regulated by the *Occupational Safety and Health Act*, 29 U.S.C. §§ 669 et seq. Section 112 of the CAA regulates emissions of asbestos fibers to ambient air. Building materials in older buildings are assumed to contain asbestos. Lead is a heavy, ductile metal commonly used in house paint until the Federal government banned the use of most lead-based paint (LBP) in 1978. PCBs are man-made chemicals that persist in the environment and were widely used in construction materials (e.g., caulk) and electrical products prior to 1978. Congress banned the manufacture and use of PCBs in 1976, and PCBs were phased out in 1978, except in certain limited uses.

Ordnance. OPNAVINST 8020.14, *Department of the Navy Explosives Safety Policy*, defines the Navy Explosives Safety Program. The program includes several elements, including explosive handling guidelines, reporting requirements, inventory management, and disposal procedures (Navy 1999).

Hazards of Electromagnetic Radiation to Ordnance. The Navy's HERO program addresses the potential for electromagnetic radiation to unintentionally initiate electro-explosive devices contained within current Navy and Marine Corps ordnance items (Mikoleit 1994). Radio and radar transmitting equipment produce high-intensity electromagnetic fields. Such fields can cause premature initiation of electro-explosive devices contained in ordnance systems. Per OPNAVINST 8023.2C, *U.S. Navy Explosives Safety Policies, Requirements, and Procedures*, planned transmitting and antenna installations must be regularly reviewed, and installations that handle ordnance must identify potential HERO problem areas.

Explosive Safety Quantity Distance. Fundamentally, ESQD arcs determine the distance between ordnance storage, facilities, and inhabitable areas. ESQD arcs are hazard zones that have been established by the DOD for the storage or handling of various quantities and types of ammunition and explosives. OPNAVINST 8020.14, *U.S. Department of the Navy Explosives Safety Policy*, identifies basic munitions and explosives safety standards and minimum ESQD criteria. These criteria apply to military and civilian personnel; units and forces; and to the siting, storage, handling, and transport of munitions and

explosives. Minimum safety distances are prescribed for separating explosives from inhabited structures, public roads, and other explosives. In general, these distances are proportional to the quantity of explosives at each location. It is desirable to limit the total quantity of explosives at any one location to minimize the area encumbered by the hazard zone.

Emergency Services. Emergency services are organizations which ensure public safety and health by addressing different emergencies. The three main emergency service functions include police, fire and rescue service, and emergency medical service. Many agencies will engage in community awareness and prevention programs to help the public avoid, detect, and report emergencies effectively. The availability of emergency services depends very heavily on location.

Flight Safety. Aircraft safety is based on the physical risks associated with aircraft flight. Military aircraft fly in accordance with FAR Part 91, General Operating and Flight Rules, which govern such things as operating near other aircraft, right-of-way rules, aircraft speed, and minimum safe altitudes. These rules include the use of tactical training and maintenance test flight areas, arrival and departure routes, and airspace restrictions as appropriate to help control air operations. In addition, naval aviators must also adhere to the flight rules, air traffic control, and safety procedures provided in Navy guidance (Navy 2004a).

3.3.2 Existing Conditions

Human health and safety at Navy installations are managed under applicable Federal and state health and safety policies, including those identified by the Navy, Marine Corps Public Health Center, and the USEPA. In addition, human health and safety is addressed in the Navy Region Southwest Safety and Occupational Health Program Instruction, which provides policy, procedures, and overall guidance for the Safety and Occupational Health Program to ensure a safe and healthful work environment for all Navy personnel. It is the policy of the Navy to observe every possible precaution in the planning and execution of all operations that occur onshore or offshore to prevent injury to people or damage to property.

3.3.2.1 NAVSTA Mayport Alternative

Scenario 1 – NAVSTA Mayport

Contaminated Materials. It is assumed that all structures constructed prior to 1978 potentially contain ACMs, 8-RCRA metals, LBP, and PCB-containing materials (e.g., caulk).

NAVSTA Mayport is not listed on the USEPA's National Priorities List. None of the piers proposed to berth the LCSs or any proposed LCS support facilities are within any Installation Restoration Program (IRP) sites. The proposed location for the MMRC is on an IRP site (Solid Waste Management Unit [SWMU] 23) and near SWMU 1, 24, and 25. Land use controls placed on these sites restrict them to industrial use only. See **Section 3.10.2.1** for further discussion of the IRP at NAVSTA Mayport.

Ordnance. Ordnance at NAVSTA Mayport would be stored on the installation. Navy Munitions Command operates a weapons storage area at NAVSTA Mayport with various types and sizes of ordnance magazines. The installation has established measures and programs for the handling and storage of ordnance to ensure it is conducted in compliance with Federal and state environmental laws and regulations.

Hazards of Electromagnetic Radiation to Ordnance. NAVSTA Mayport has equipment that emits electromagnetic radiation. The electromagnetic environments of ships and shore facilities can change with new or modified radar, electronic warfare, communications, and navigation transmitter installations.

Changes could also occur to ordnance configuration, inventories, and operations. HERO at NAVSTA Mayport is managed in accordance with the Navy Technical Manual: NAVSEA OP 3565/NAVAIR 16-1-529 Volume 2 *Electromagnetic Radiation Hazards (U) (Hazards to Ordnance) (U).* This document prescribes operating procedures and precautions to prevent initiation of electroexplosive devices in ordnance from electromagnetic radiation.

Explosive Safety Quantity Distance. NAVSTA Mayport ESQD arcs are depicted in **Figure 3-1**. The proposed facilities are not within ESQD arcs.

Emergency Services. The current fire and emergency services at NAVSTA Mayport provide emergency response and fire fighting capabilities for structural fires, shipboard fires, aircraft rescue for firefighting response, specialized rescue, and hazardous materials incidents. The fire department provides fire suppression, fire prevention, emergency medical aid, and hazardous materials response. Services also include primary ambulance response for the installation, water rescue, hazardous materials response for spill control and containment, public fire safety education, inspections, technical services to facilitate contract construction companies and Navy organizations, assistance in arson investigations, and applicable code enforcement (Navy 2008). The fire station is located in Building 365 at NAVSTA Mayport (Navy 2012a). The department has five fire companies: two for structural fire response, two for airfield crash response, and one advanced life support ambulance transport unit (Dietz 2007).

Security services on the installation are provided by the NAVSTA Mayport Security Department, which operate out of Building 1591, directly inside the main gate (Navy 2012b). Piers are protected further by security personnel who operate from vessels on the water in port (Navy 2008).

Scenario 2 – NAVSTA Mayport-NSB Kings Bay

Contaminated Materials. It is assumed that all structures constructed prior to 1978 potentially contain ACMs, LBP, and PCB-contaminated materials (e.g., caulk).

Emergency Services. NSB Kings Bay has two fire stations on the installation. Since the proposed activities would consist solely of the renovation of two buildings, the response time or efforts of emergency services on NSB Kings Bay would not be impacted. Therefore, impacts on emergency services are not discussed further in this EA.

Hazards of Electromagnetic Radiation to Ordnance. HERO conditions at NSB Kings Bay are similar to those described for NAVSTA Mayport.

Explosive Safety Quantity Distance. The proposed facilities at NSB Kings Bay are not within ESQD arcs.

3.3.2.2 NAVSTA Norfolk Alternative

Contaminated Materials. It is assumed that all structures constructed prior to 1978 potentially contain ACMs, LBP, and PCB-contaminated materials (e.g., caulk). ACMs, LBP, and PCB-containing materials are handled in accordance with applicable Federal and state regulations, Navy mid-Atlantic regional regulations and NAVSTA Norfolk Standard Operating Procedures (SOPs).

NAVSTA Norfolk is listed on the USEPA's National Priorities List; however, remedies for treatment are in place. The DOD has developed the IRP to facilitate thorough investigation and cleanup of contaminated sites on military installations. Twenty-three IRP sites have been identified on the installation. The region where the facilities are proposed is not within an IRP site. See **Section 3.10.2.2** for further discussion of the IRP at NAVSTA Norfolk.

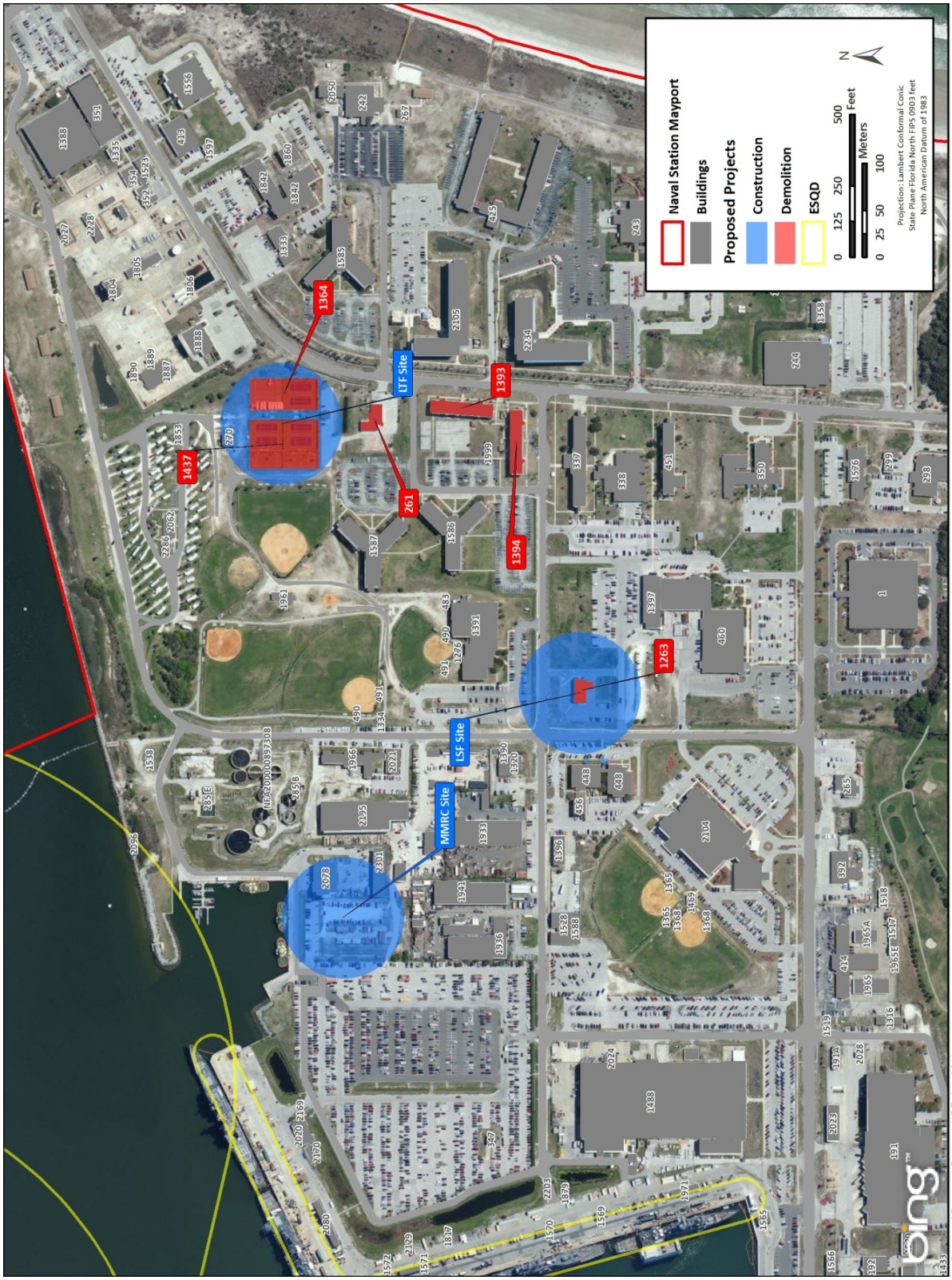

Figure 3-1. Locations of ESQD Arcs at NAVSTA Mayport

Ordnance. Ordnance at NAVSTA Norfolk would be stored at Naval Weapons Station Yorktown. The handling and storage of ordnance would be similar to, and consistent with, other installation ordnance operations. The installation has established measures and programs for the handling and storage of ordnance to ensure it is conducted in compliance with Federal and state environmental laws and regulations.

Hazards of Electromagnetic Radiation to Ordnance. NAVSTA Norfolk has equipment that emits electromagnetic radiation. The electromagnetic environments of ships and shore facilities can change with new or modified radar, electronic warfare, communication, and navigation transmitter installations. Changes could also occur to ordnance configuration, inventories, and operations. HERO at NAVSTA Norfolk is managed in accordance with the Navy Technical Manual: NAVSEA OP 3565/NAVAIR 16-1-529 Volume 2 *Electromagnetic Radiation Hazards (U) (Hazards to Ordnance) (U).* This document prescribes operating procedures and precautions to prevent initiation of electroexplosive devices in ordnance from electromagnetic radiation.

Explosive Safety Quantity Distance. NAVSTA Norfolk ESQD arcs are depicted in **Figure 3-2**. The Proposed Action sites are not within ESQD arcs.

Emergency Services. The current services at NAVSTA Norfolk provide emergency response and fire fighting capabilities for structural fires, shipboard fires, aircraft rescue for firefighting response, specialized rescue, and hazardous materials incidents. The fire department provides fire suppression and prevention, emergency medical aid, and hazardous materials response. Services also include primary ambulance response for the installation, water rescue, hazardous materials response for spill control and containment, public fire safety education, inspections, technical services to facilitate contract construction companies and Navy organizations, assistance in arson investigations, and applicable code enforcement.

The fire station is located in Building 365 at NAVSTA Mayport (Navy 2012a). The department has five fire companies: two for structural fire response, two for airfield crash response, and one advanced life support ambulance transport unit (Dietz 2007). The department has four fire stations staffed by five engine companies, four crash companies for airfield coverage, one ladder truck, one advance life support quick response vehicle, and two basic life support ambulances. Cross-staffed apparatus is inclusive of one hazardous material response vehicle, two medium/heavy rescue squads, and one cross-staffed basic life support ambulance (Beasley 2008).

NAVSTA Norfolk maintains four fire stations. Fire Station 1 is in building CEP 201, Station 2 is in building R 43, Station 3 is in LP 166 and Station 4 is in BEN 154. These stations are staffed by five engine companies, four crash companies for airfield coverage, one ladder truck, one advance life support quick response vehicle, and two basic life support ambulances. Cross-staffed apparatus is inclusive of one hazardous material response vehicle, two medium/heavy rescue squads, and one cross-staffed basic life support ambulance (Beasley 2008).

Security services on the installation are provided by the NAVSTA Norfolk Security Department, which operate from Building CEP161. Piers are protected further by security personnel who operate from vessels on the water in port and manning posts on the piers.

Source of Proposed Projects: HDR, Inc. 2012

Figure 3-2. Locations of ESQD Arcs at NAVSTA Norfolk

3.3.2.3 MCAS Cherry Point

Safety issues directly related to the testing of Firescout are discussed here. All other health and safety concerns are similar to the other installations and MCAS Cherry Point adheres to the regulations cited in **Section 3.3.2**.

Flight Safety. The MCAS Cherry Point assigned airspace is Class D, which extends upward from the surface to and including 2,500 feet above ground level within a 5-statute-mile radius of the airfield. Class D airspace is generally airspace from the surface to 2,500 feet above the airport elevation surrounding airports that have an operational control tower. The configuration of each Class D airspace is individually tailored and when instrument procedures are published, the airspace is normally designed to contain the procedures. Unless otherwise authorized, each aircraft must establish two-way radio communications with the Air Traffic Control facility prior to entering the airspace and thereafter maintain those communications while in the airspace.

A Bird/Wildlife Aircraft Strike Hazard (BASH) program is in place at MCAS Cherry Point to address the hazards from resident and migratory bird species. In the BASH program, air operations, aviation safety, and natural resources personnel work together to reduce the risk of bird and wildlife strikes through the Operational Risk Management process. Development and implementation of an effective BASH program requires constant interaction between the air station's natural resources, aviation safety, and air operations communities, and the pilots and aircrews. MCAS Cherry Point's Air Station Order 3000.2b is the BASH guidance for the installation and details roles and responsibilities for its implementation.

Currently, several different types of UAVs conduct operations at MCAS Cherry Point.

3.3.3 Environmental Consequences

3.3.3.1 NAVSTA Mayport Alternative

Scenario 1 – NAVSTA Mayport

Contaminated Materials. The proposed project locations are not on contaminated sites. Contamination present in the buildings slated for demolition would be handled in accordance with applicable policies and procedures, including inspection by a state-certified inspector prior to commencement of demolition activities. Demolition plans would be reviewed by installation civil engineering personnel to ensure appropriate measures were taken to remove ACMs, 8-RCRA metals, LBP, and PCB-containing materials, and reduce potential exposure to, and release of, asbestos, lead, and PCBs. The removal of ACMs, LBP, and PCB-contaminated materials during renovation activities would be conducted in accordance with applicable regulations. ACM would be removed by state-certified individuals prior to demolition and disposed of at a USEPA-approved landfill. Debris containing LBP would be characterized as demolition waste or LBP-contaminated demolition debris, which would be disposed of at a USEPA-approved landfill. Construction materials (e.g., caulk) containing PCBs could be disposed of at a non-hazardous waste landfill. Contractors would be required to adhere to Federal and state regulations in addition to installation management plans. The installation has established measures and programs for the management of ACMs, LBP, and PCBs to ensure they are handled and disposed of in compliance with Federal and state environmental laws and regulations. No significant impacts on human health and safety would be expected from contaminated materials.

Ordnance. Ordnance at NAVSTA Mayport would be stored on the installation. For purposes of this analysis, it is assumed that ordnance would be put on the LCSs when they were leaving the port and

would be returned to storage when they return. It is assumed that the transfer of ordnance onboard and offboard an LCS would occur pierside at NAVSTA Mayport. As stated in **Section 3.3.2.1**, the handling and storage of ordnance would be similar to, and consistent with, other installation ordnance operations. The installation has established measures and programs for the handling and storage of ordnance to ensure it is conducted in compliance with Federal and state environmental laws and regulations. No significant impacts on human health and safety would be expected from ordnance.

Hazards of Electromagnetic Radiation to Ordnance and Explosive Safety Quantity Distance. Implementation of the NAVSTA Mayport Scenario would result in new sources of electromagnetic radiation including radar, fathometers (i.e., echo-sounding equipment used to determine the depth of water or a submerged object from the ship's keel to the ocean floor for safe operational navigation), and electronic warfare systems. However, these new sources would be minimal and similar to civilian navigational aids and radars at local airports and television weather stations throughout the United States. The installation has existing measures, programs, and SOPs, including those contained in the technical safety manual Naval Sea Systems Command Operating Procedure 3565, *Electromagnetic Radiation Hazards (Hazards To Personnel, Fuel And Other Flammable Material)*, that would be implemented, as appropriate. None of the Proposed Action locations are within an ESQD arc.

Emergency Services. No impacts on human health and safety would be expected on emergency services. The Proposed Action would not impact the response time or efforts of the fire, force protection personnel, emergency management, or emergency medical crews on NAVSTA Mayport.

Scenario 2 – NAVSTA Mayport-NSB Kings Bay

Contaminated Materials. Prior to renovation, Building 5087 would be investigated for the presence of ACM, LBP, and PCB. ACMs, LBP, and PCB-contaminated materials would be handled in accordance with applicable Federal and state regulations, Navy southeast regional regulations, and NSB Kings Bay SOPs. Impacts on human health and safety would be similar as described under the NAVSTA Mayport Scenario although the materials would be generated from renovation activities and not demolition. The building would be investigated prior to renovation for the presence of contaminated materials. No significant impacts on human health and safety would be expected from contaminated materials.

3.3.3.2 NAVSTA Norfolk Alternative

Contaminated Materials. Impacts on worker safety would be similar to those described for the NAVSTA Mayport Scenario since Navy regulations and guidelines would be followed.

Ordnance. Impacts on worker safety would be similar to those described for the NAVSTA Mayport Scenario since Navy regulations and guidelines would be followed. However, ordnance would be loaded onboard and offboard the LCSs at NWS) Yorktown.

Hazards of Electromagnetic Radiation to Ordnance and Explosive Safety Quantity Distance. Impacts on worker safety would be similar to those described for the NAVSTA Mayport Alternative since Navy regulations and guidelines would be followed.

Emergency Services. No impacts would be expected. The Proposed Action would not impact the response time or efforts of the fire, force protection personnel, emergency management, or emergency medical crews on NAVSTA Norfolk.

3.3.3.3 MCAS Cherry Point

Flight Safety. Firescout test flights would be required at MCAS Cherry Point to verify that maintenance has been performed properly. There would be no Firescout flights from MCAS Cherry Point to any other installation. The requirements for these test flights are contained in Naval Air Forces Instruction 4790.2, *Naval Aviation Maintenance Program*. Firescout test flights would be conducted in accordance with FAR Part 91; OPNAVINST 3710.7U, Naval Air Training and Operating Procedures Standardization General Flight and Operating Instructions; Naval Air Forces Instruction 4790.2; Firescout-specific operating manuals; DOD Flight Information Publications and Clearance Manuals; and Federal, state, and local aviation-related rules, restrictions, laws, and ordinances including the Certificate of Authorization. Emergencies or malfunctions associated with the Firescout test flights would be handled in accordance with OPNAVINST 3710.7U and established aircraft-specific procedures.

Emergencies with UAVs can occur from a loss of communication between the aircraft and the pilot. When the UAV senses a significant delay or loss of the communication, it is programmed to enter automatically into a return home mode of flight. The return home profile would be determined before launch by the UAV pilot. When the UAV pilot recognizes the UAV is on its return home profile, emergency procedures would be performed as required in the UAV Naval Air Training and Operating Procedures Standardization manual. The UAV would fly a pre-approved route and altitude to its home site. During this emergency, the UAV pilot would attempt to reestablish communication with the aircraft. If contact is reestablished, the commander can choose to terminate the mission and return the aircraft to the installation or continue with the mission as planned. Upon notification of an in-flight emergency, the mission commander would ensure emergency procedures are being performed by UAV pilots in accordance with the UAV Naval Air Training and Operating Procedures Standardization manual. The mission commander would notify the appropriate air control agency to coordinate changes to the route of flight, if necessary.

Firescout test flights would be conducted in existing Class D Airspace at MCAS Cherry Point or the Restricted Airspace that is immediately adjacent. This airspace overlies both land and water; therefore, the helicopters could be over land or water depending on air traffic and weather considerations. The test flights would consist of preprogrammed profiles, similar to those of other existing manned and unmanned helicopters at the installation. The Firescout test flights would occur in the same airspace areas in which other aircraft and UAVs are currently operating. Flights from the installation are coordinated by the Radar Air Traffic Control Facility and would be conducted in accordance with established Air Traffic Control procedures.

The test flights would total approximately 10 to 15 hours per month for all Firescouts. One test flight would be less than 1 hour (approximately 30 minutes); therefore, about 30 test flights could be conducted each month for a total of 360 expected flights per year. There are more than 100,000 flight operations (i.e., takeoffs or landings) conducted annually at MCAS Cherry Point; therefore, this increase in flights would represent a negligible increase in operations. It is expected that this increase would not impair the ability of the Radar Air Traffic Control Facility to coordinate flights from the installation, within the Class D airspace surrounding the installation, or the adjacent Restricted Airspace.

The slight increase in operations at MCAS Cherry Point would not be expected to increase the risk of mishaps significantly. Existing SOPs at MCAS Cherry Point would be employed to ensure appropriate airspace management associated with the participating aircraft, which would reduce the potential for crowding or mishaps. Therefore, no significant impacts on human health and safety from aircraft mishaps would be expected.

Firescout operations would conform to MCAS Cherry Point BASH guidelines and procedures to minimize bird aircraft strike hazards.

3.3.3.4 No Action Alternative

Under the No Action Alternative, LCS ships would not be homeported on the East Coast of the United States. No significant impacts on human health and safety would occur under this alternative. The No Action Alternative would result in the continuation of existing conditions at the proposed installations as described in **Section 3.3.2**.

3.4 Coastal Zone Management

3.4.1 Definitions

The Coastal Zone Management Act (CZMA) of 16 U.S.C. § 1451 et seq., as amended, 15 CFR § 921-930 provides assistance to states, in cooperation with Federal and local agencies, for developing land and water-use programs in coastal zones. When a state coastal management plan is federally approved, Federal agencies proposing actions with the potential to affect the state's coastal uses or resources are subject to review under the CZMA Section 307 Federal consistency determination requirement. Section 307 mandates that "Federal actions within a state's coastal zone (or outside the coastal zone, if the action affects land or water uses or natural resources within the coastal zone) be consistent to the maximum extent practicable with the enforceable policies of the state coastal management plan" (16 U.S.C. § 1456(c)(1)(A)).

An enforceable policy is a state policy that is legally binding under state law (e.g., through constitutional provisions, laws, regulations, land use plans, ordinances, or judicial or administrative decisions), and by which a state exerts control over private and public coastal uses and resources, and which are incorporated in a state's federally approved Coastal Management Program [CZMA § 304(6a) and 15 CFR § 930.11(h)]. Enforceable policies are given legal effect by state law and do not apply to Federal lands, Federal waters, Federal agencies or other areas or entities outside a state's jurisdiction, unless authorized by Federal law (the CZMA does not confer such authorization).

At the heart of Federal consistency is the "effects test." A Federal action is subject to CZMA Federal consistency requirements if the action will affect a coastal use or resource, in accordance with National Oceanic and Atmospheric Administration (NOAA) regulations.

According to 15 CFR § 930.11(g), the term "effect on any coastal use or resource" means any reasonably foreseeable effect on any coastal use or resource resulting from a Federal agency activity or Federal license or permit activity (including all types of activities subject to the Federal consistency requirement under subparts C, D, E, F, and I of this part). Effects are not just environmental effects, but include effects on coastal uses. Effects include both direct effects which result from the activity and occur at the same time and place as the activity, and indirect (cumulative and secondary) effects which result from the activity and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects are effects resulting from the incremental impact of the Federal action when added to other past, present, and reasonably foreseeable actions, regardless of what person(s) undertake(s) such actions.

3.4.2 Existing Conditions

3.4.2.1 NAVSTA Mayport Alternative

Scenario 1 – NAVSTA Mayport

Florida has a federally approved Coastal Zone Management (CZM) program. Florida's coastal zone includes the area encompassed by all 67 counties in the state and its territorial seas to 3 nautical miles from Florida's East Coast, but excludes all Federal facilities like NAVSTA Mayport. Federal actions undertaken at NAVSTA Mayport that have reasonably foreseeable effects on Florida's coastal zone must be consistent with Florida's 24 enforceable policies. The enforceable policies relevant to the Proposed Action include Beach and Shoreline Preservation, Saltwater Fisheries, Wildlife, Land and Water Management, State and Regional Planning, Emergency Management, State Parks and Preserves, Land Acquisition for Conservation or Recreation, Florida Greenways and Trails Act, Historic Resources, Water Resources, Outdoor Recreation and Conservation Lands, Pollutant Discharge Prevention and Removal, Energy Resources, and Soil and Water Conservation.

Scenario 2 – NAVSTA Mayport-NSB Kings Bay

As previously described, due to the nature of the actions proposed at NSB Kings Bay, the actions would not have any reasonably foreseeable effects on any land or water use or natural resource of Georgia's coastal zone, and, as such, a detailed discussion has not been included.

3.4.2.2 NAVSTA Norfolk Alternative

Virginia has a federally approved CMP. Virginia's coastal zone encompasses the 29 counties, 17 cities, and 42 incorporated towns, which compose "Tidewater Virginia." The state's coastal zone includes all of Virginia's Atlantic coast watershed and parts of the Chesapeake Bay and Albemarle – Pamlico Sound watersheds. The City of Norfolk is within Virginia's designated coastal zone. Thus, Federal actions in Norfolk are subject to comply with the state's enforceable policies as relevant to the Proposed Action, which include protecting the following resources: Tidal and Non-tidal Wetlands, Fisheries, Subaqueous Lands, Dunes and Beaches, Point Source Air Pollution, Point Source Water Pollution, Nonpoint Source Water Pollution, Shoreline Sanitation, and Coastal Lands.

3.4.2.3 MCAS Cherry Point

Due to the nature of the actions proposed at MCAS Cherry Point, no reasonably foreseeable effects on any land or water use or natural resource of North Carolina's coastal zone would be expected. Therefore, a detailed discussion has not been included.

3.4.3 Environmental Consequences

3.4.3.1 NAVSTA Mayport Alternative

Scenario 1 – NAVSTA Mayport

The Navy determined that the Proposed Action would affect the coastal uses or resources of Florida. The Navy developed a Coastal Consistency Determination, in accordance with 15 CFR 930.39 under the CZM for the Proposed Action at NAVSTA Mayport and submitted it to the Florida State Clearinghouse for review on 21 March 2013. The Florida Clearinghouse has reviewed the U.S. Navy's Negative

Determination and the state concurs with the Navy's determination that the activities proposed are consistent with the enforceable policies of the Florida Coastal Management Program. The state's continued concurrence will be based on the activities' continued compliance with Florida Coastal Management Program authorities, including Federal and state monitoring to ensure said sustained compliance, and the adequate resolution of issues identified during this and subsequent reviews. The state's final concurrence of the project's consistency with the Florida Coastal Management Program will be determined during the environmental permitting process, in accordance with Section 373.428, Florida Statutes, and applicable regulations at 15 CFR 930. **Appendix C** contains the Coastal Consistency Determination and related correspondence.

3.4.3.2 NAVSTA Norfolk Alternative

The Navy has determined that the Proposed Action would affect the coastal uses or resources of Virginia. The Navy initiated consultation regarding coastal resources on the preferred alternative (NAVSTA Mayport) and did not consult on the NAVSTA Norfolk Alternative. If this Alternative were to be implemented, the Navy would develop, in accordance with 15 CFR 930.39, a Coastal Consistency Determination and submit it to the Virginia CZM Program office for review. The Coastal Consistency Determination would incorporate the activities proposed under the NAVSTA Norfolk Alternative.

3.4.3.3 MCAS Cherry Point

The Marine Corps has reviewed the enforceable policies of the North Carolina CZM and has determined that the Proposed Action would not have any reasonably foreseeable effects on any land or water use or natural resource of North Carolina's coastal zone. In addition this activity would take place on a Federal installation and would not have any indirect effects on any state coastal resources or uses. Therefore, a Negative Determination under CZMA Federal Consistency Regulations § 930.35 is not required, and the Marine Corps is not required to coordinate with the State of North Carolina under Section 307 *Coordination and Cooperation* of the CZMA.

3.4.3.4 No Action Alternative

Under the No Action Alternative, LCS ships would not be homeported on the East Coast of the United States and Firescouts would not be stored and maintained at MCAS Cherry Point. The necessary actions to homeport these vessels would not be undertaken and therefore, CZM consistency determinations would not be necessary.

3.5 Geological Resources

3.5.1 Definitions

Geological resources consist of the Earth's surface and subsurface materials. Within a given physiographic province, these resources typically are described in terms of topography and physiography, geology, soils, and, where applicable, geologic hazards.

Geology. Geology is the study of the Earth's composition and provides information on the structure and configuration of surface and subsurface features. Such information derives from field analysis based on observations of the surface and borings to identify subsurface composition.

Topography. Topography and physiography pertain to the general shape and arrangement of a land surface, including its height and the position of its natural features and human-made alterations of landforms.

Soils. Soils are the unconsolidated materials overlying bedrock or other parent material. Soils typically are described in terms of their complex type, slope, and physical characteristics. Differences among soil types in terms of their structure, elasticity, strength, shrink-swell potential, and erosion potential affect their abilities to support certain applications or uses. In appropriate cases, soil properties must be examined for their compatibility with particular construction activities or types of land use.

Geologic Hazards. Geologic hazards are defined as natural geologic events that can endanger human lives and threaten property. Examples of geologic hazards include earthquakes, landslides, rock falls, ground subsidence, and mass wasting.

3.5.2 Existing Conditions

3.5.2.1 NAVSTA Mayport Alternative

Scenario 1 – NAVSTA Mayport

Geology and topography at NAVSTA Mayport would not be impacted under the Proposed Action; therefore, these topics are not discussed in further detail in this section. Soils and geological hazards at and within the vicinity of the project locations at NAVSTA Mayport are evaluated in further detail in this section.

Soils. NAVSTA Mayport Scenario would only disturb soils in the vicinity of the LCS support facilities proposed for construction and the other facilities proposed for demolition. The U.S. Department of Agriculture Natural Resources Conservation Service (USDA NRCS) has mapped the soils in the vicinity of these facilities and identified the following two soil types:

- *Urban Land.* Urban land consists of soils with no identifiable soil characteristics due to past development. Urban land soils are common in developed areas in cities and include surfaces covered with buildings, streets, and sidewalks. Approximately half of NAVSTA Mayport is underlain by Urban land (USDA NRCS 2012).
- *Arents, nearly level.* Arents, nearly level is a soil unit commonly found in coastal settings. The soil structure is composed of sand and results from marine deposits. This soil unit is considered somewhat poorly drained but has a low frequency for flooding and ponding of water (USDA NRCS 2012).

No prime farmland soils have been mapped at the project sites. No in-water work would be required under this alternative; therefore a discussion on marine sediments is not included.

Geologic Hazards. Sinkholes are common in areas where sedimentary limestone bedrock is present, such as the Jacksonville, Florida, area. Sinkholes can appear with little warning and cause damage to structures and roadways. At least seven sinkhole events have been documented in Duval County, Florida, between 1984 and 2008.

No geological hazards, such as earthquakes or volcanism, have been identified for northeastern Florida.

Scenario 2 – NAVSTA Mayport-NSB Kings Bay

As described on page 3-1, due to the nature of the actions proposed at Kings Bay, there are no potential impacts on geological resources, and, as such, a detailed analysis for this resource area is not provided.

3.5.2.2 NAVSTA Norfolk Alterative

Geology and topography at NAVSTA Norfolk would not be impacted by the Proposed Action; therefore, these topics are not discussed in further detail in this section. Soils and geological hazards at and within the vicinity of the project locations at NAVSTA Norfolk are evaluated in further detail in this section.

Soils. This construction area under the NAVSTA Norfolk Alternative would be limited to the existing parking area to the north of Building Z-309 and to the south of Morris Street. The USDA NRCS has mapped the soils in this region as Urban land (USDA NRCS 2012).

Geologic Hazards. No geological hazards, such as earthquakes or volcanism, have been identified for southeastern Virginia. The 2008 National Seismic Hazard map shows that the Norfolk, Virginia, area has a seismic hazard rating of approximately 4 to 8 percent, indicating minor damage due to seismic events (USGS 2008). An earthquake occurred in southeastern Virginia in 2011 and resulted in minimal building damage (USGS 2012).

3.5.2.3 MCAS Cherry Point

The Firescout component of the Proposed Action does not entail any ground disturbance at MCAS Cherry Point. As such, existing geological resource conditions at MCAS Cherry Point are not discussed.

3.5.3 Environmental Consequences

3.5.3.1 NAVSTA Mayport Alternative

Scenario 1 – NAVSTA Mayport

Impacts on geological resources would be limited to the areas where ground disturbance would occur, which includes the area where the LSF is proposed for construction and the other facilities proposed for demolition. Soil erosion and sediment production would be minimized during construction by following the installation's Erosion-and-Sediment-Control Plan, a Storm Water Pollution Prevention Plan (SWPPP), and complying with regulations in Section 438 of the Energy Independence and Security Act, which requires the implementation of low-impact development. Site-specific soil testing could be conducted prior to beginning construction activities to determine if soil limitations exist. The design of the proposed buildings would include appropriate design features to overcome any soil limitations should they exist.

Impacts on geological resources would occur from soil compaction, erosion, and sedimentation from implementing NAVSTA Mayport Scenario. These impacts would not substantially alter geological conditions and most of the soils on the installation have been previously disturbed. Based on the nature of these impacts, no significant impact on the geological resources would be expected under NAVSTA Mayport Scenario.

3.5.3.2 NAVSTA Norfolk Alterative

Impacts on geological resources would be limited to the areas where ground disturbance would occur, which includes the area that the support facilities are proposed for construction to the north of Building

Z-309 and to the south of Morris Street. Soil erosion and sediment production would be minimized during construction by following the installation's Erosion-and-Sediment-Control Plan, an SWPPP, and Section 438 of the Energy Independence and Security Act, which requires the implementation of low-impact development. Site-specific soil testing would be conducted prior to beginning construction activities to determine if soil limitations exist. The design of the proposed buildings would include appropriate design features to overcome any soil limitations should they exist.

Impacts on geological resources would occur from soil compaction, erosion, and sedimentation from implementing the NAVSTA Norfolk Alternative. These impacts would not substantially alter geological conditions and the soils on the installation have been previously disturbed. Based on the nature of these impacts, no significant impacts on the geological resources would be expected under NAVSTA Norfolk Alternative.

3.5.3.3 MCAS Cherry Point

The Firescout component does not entail any ground disturbance at MCAS Cherry Point, only minor building renovations. Therefore, no impacts on the geological resources would be expected from the Firescout component.

3.5.3.4 No Action Alternative

Under the No Action Alternative, the LCS ships would not be homeported on the East Coast of the United States. Existing geological resource conditions would continue as described in **Section 3.5.2**. No effects would occur.

3.6 Biological Resources

3.6.1 Definitions

Biological resources include native or naturalized plants and animals and the habitats (e.g., grasslands, forests, and wetlands) in which they exist. Protected and sensitive biological resources include listed (threatened or endangered) and proposed species under the ESA as designated by the U.S. Fish and Wildlife Service (USFWS), state-listed threatened or endangered species, and migratory birds. Migratory birds are protected under the Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. § 703–712) as amended, and Executive Order (EO) 13186.

Sensitive habitats include those areas designated by the USFWS as Critical Habitat protected by the ESA and sensitive ecological areas as designated by state or Federal rulings. Sensitive habitats also include wetlands, plant communities that are unusual or of limited distribution, and important seasonal use areas for wildlife (e.g., migration routes, breeding areas, crucial summer and winter habitats). Critical Habitat is designated if the USFWS determines that is it essential to a threatened or endangered species' conservation. In consultation for those species with Critical Habitat, Federal agencies are required to ensure that their activities do not adversely modify or destroy Critical Habitat to the point that it will no longer aid in the species' recovery.

LCS training and transits in and out of port are not addressed in this EA. No in-water or pier construction or additional dredging would be required for berthing the ships, and no new construction or modifications would be required for handling the cargo and mission modules. Therefore, there are no impacts on marine species and they will not be discussed in this document.

3.6.2 Existing Conditions

3.6.2.1 NAVSTA Mayport Alternative

Scenario 1 – NAVSTA Mayport

Vegetation. NAVSTA Mayport is a predominantly urban area and vegetative communities are limited to landscaped vegetation, including ornamental trees, shrubs, and turfgrass. Submerged aquatic vegetation is not likely to be found on NAVSTA Mayport due to regular dredging (NAVFAC LANT 2008). Microalgae, including phytoplankton, are widespread and abundant in the estuarine water column where light is sufficient for growth. The dominant genus of floating macroalgae, *Sargassum*, is widely distributed in offshore waters of the North Atlantic Ocean (Gower and King 2008, SAFMC 2002), but could be brought in to nearshore water and estuaries by winds and tides. Attached macroalgae (i.e., seaweed) form "meadows" or "beds" where they dominate intertidal shores or subtidal bottoms. Seaweeds could grow attached to hard substrate (Nybakken 1993).

Wildlife. The most prevalent wildlife species on NAVSTA Mayport are shore birds, aquatic birds, seabirds, and passerines; however, densities of these species are generally low, peaking in winter months due to an increase in migratory species. More common residents include brown pelican (*Pelecanus occidentalis*), osprey (*Pandion haliaetus*), and the double-crested cormorant (*Phalacrocorax auritus*) (Navy 2008). Mammals on the installation are typically found in urban environments and could include raccoons (*Procyon lotor*), marsh rabbits (*Sylvialagus palustris*), opossums (*Didelphis virginiana*), armadillos (*Dasypus novemcinctus*), striped skunks (*Mephitis mephitis*), and gray squirrels (*Sciurus carolinensis*).

Protected and Sensitive Species. There are a variety of protected and sensitive species in the vicinity of NAVSTA Mayport, as identified in the NAVSTA Mayport INRMP, and USFWS and Florida Natural Areas Inventory species lists by county. The species that have the potential to occur on NAVSTA Mayport are listed in **Table 3-17** and are discussed in the following paragraphs.

Terrestrial. Terrestrial sensitive and protected species near NAVSTA Mayport include the American alligator (*Alligator mississippiensis*), frosted salamander (*Ambystoma cingulatum*), gopher tortoise (*Gopherus polyphemus*), and striped newt (*Nothophthalmus pertriatus*) (USFWS 2012a).

Migratory Birds. Piping plovers (*Charadrius melodus*) have documented critical habitat just north of NAVSTA Mayport along the northern shore of the St. Johns River, however none have been documented on base (NAVSTA Mayport 2007a). Wood storks (*Mycteria americana*) have also been identified at the entrance channel to the St. Johns River (NAVFAC LANT 2008). State-listed species, including little blue heron (*Egretta caerulea*), tricolored heron (*Egretta tricolor*), snowy egret (*Egretta thula*), Worthington's marsh wren (*Cistothorus palustris griseu*), and white ibis (*Eudocimus albus*) have been found in wetland areas throughout NAVSTA Mayport. Least terns (*Sterna antillarum*), a state-threatened species, have nested on the westernmost portions of the installation (NAVSTA Mayport 2007a). Bald eagles (*Haliaeetus leucocephalus*) have been observed nesting near the Jacksonville Zoo, less than 1 mile from the installation (NAVSTA Mayport 2007a).

Scenario 2 – NAVSTA Mayport-NSB Kings Bay

As previously described, due to the nature of the actions proposed at NSB Kings Bay, there are no potential impacts on biological resources, and, as such, a detailed analysis for this resource area is not provided.

Table 3-17. Protected and Sensitive Species that Could Occur on NAVSTA Mayport and NSB Kings Bay

Common Name	Scientific Name	Listing Status
Amphibians/Reptiles		
American alligator	*Alligator mississippiensis*	T (S/A)
Frosted salamander	*Ambystoma cingulatum*	T
Eastern indigo snake	*Drymarchon corais couperi*	T
Gopher tortoise	*Gopherus polyphemus*	C
Striped newt	*Nothophthalmus pertriatus*	C
Birds[1]		
Florida burrowing owl	*Athene cunicularia floridana*	SSC
Piping plover	*Charadrius melodus*	T
Worthington's marsh wren	*Cistothorus palustris griseu*	SSC
Little blue heron	*Egretta caerulea*	SSC
Snowy egret	*Egretta thula*	SSC
Tricolored heron	*Egretta tricolor*	SSC
White ibis	*Eudocimus albus*	SSC
Bald eagle[2]	*Haliaeetus leucocephalus*	NL
Wood stork	*Mycteria americana*	E
Red-cockaded woodpecker[3]	*Picoides borealis*	E
Least tern	*Sterna antillarum*	ST

Sources: USFWS 2012a, USFWS 2012b, FNAI 2012, NAVSTA Mayport 2007a

Notes: This list is not exhaustive and is subject to change over time. The Navy would comply with any updates to species status during the implementation of this project.

1. Listed birds are also protected under the MBTA.
2. Bald eagles are not federally or state-listed species, but are protected under the Bald and Golden Eagle Protection Act.
3. NSB Kings Bay only.

Key:

C = Candidate Species (Federal designation)

S = State only

SSC = Species of Special Concern (State designation)

T (S/A) = Threatened due to similarity of appearance. These species are not biologically threatened or endangered and are not subject to Section 7 consultation.

T = Threatened

E = Endangered

NL = Not listed under the ESA.

3.6.2.2 NAVSTA Norfolk Alternative

Vegetation. NAVSTA Norfolk is an urban area primarily composed of buildings and pavement. Vegetative communities on the installation are generally limited to landscaped vegetation (NAVFAC 2005).

Wildlife. The most prevalent wildlife species on NAVSTA Norfolk are those typically found in urban environments and include red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), raccoons, eastern cottontail (*Sylvialagus floridanus*), opossums, and gray squirrels. Smaller rodents, such as the eastern mole (*Scalopus aquaticus*), Norway rat (*Rattus norvegicus*), and house mouse (*Mus musculus*) are common. Reptiles, including the eastern box turtle (*Terrapene carolina carolina*), are also readily found (NAVFAC 2005).

Protected and Sensitive Species. There are a variety of protected and sensitive species in the vicinity of NAVSTA Norfolk, as identified by USFWS and Virginia Department of Conservation and Recreation species lists by city and county (see **Table 3-18**). These species are discussed in the following paragraphs.

Table 3-18. Protected and Sensitive Species that Could Occur on NAVSTA Norfolk

Common Name	Scientific Name	Listed Status
Amphibians/Reptiles		
Canebrake rattlesnake	*Crotalus horridus* [coastal plain pop.]	SE
Chicken turtle	*Deirochelys reticularia*	SE
Barking tree frog	*Hyla gratiosa*	ST
Eastern glass lizard	*Ophisaurus ventralis*	ST
Birds[1]		
Red knot	*Calidris canutus rufa*	C
Piping plover	*Charadrius melodus*	T
Peregrine Falcon	*Falco peregrinus*	ST
Bald eagle [2]	*Haliaeetus leucocephalus*	ST
Roseate tern	*Sterna dougallii dougallii*	E
Plants and Lichens		
Blue witch grass	*Dichanthelium caerulescens*	C
Anomalous eupatorium	*Eupatorium anomalum*	C
Long Beach seedbox	*Ludwigia brevipes*	C
Raven's seedbox	*Ludwigia ravenii*	C
Virginia least trillium	*Trillium pusillum var. virginianum*	C

Sources: NAVFAC 2005, USFWS 2012a, VDCR 2012

Notes: This list is not exhaustive and is subject to change over time. The Navy would comply with any updates to species status during the implementation of this project.

1. Listed birds are also protected under the MBTA.
2. Bald eagles are not federally or state-listed species, but are protected under the Bald and Golden Eagle Protection Act.

Key:

C = Candidate Species (Federal designation)

T = Threatened

E = Endangered

Terrestrial. Several candidate plant species are found in the tidewater region of Virginia and include blue witch grass (*Dichanthelium caerulescens*), anomalous eupatorium (*Eupatorium anomalum*), Long Beach seedbox (*Ludwigia brevipes*), raven's seedbox (*Ludwigia ravenii*), and Virginia least trillium (*Trillium pusillum var. virginianum*) (USFWS 2012a). The northeastern beach tiger beetle (*Cincindela doraslis dorsalis*) is also found near NAVSTA Norfolk (USFWS 2012a).

Migratory birds. A variety of protected birds can be found in proximity to NAVSTA Norfolk including the bald eagle, red knot, piping plover, and roseate tern (*Sterna dougallii dougallii*).

3.6.2.3 MCAS Cherry Point

Vegetation. MCAS Cherry Point includes pine forest communities, lower slope mixed hardwoods, inland floodplain swamp forests, freshwater marshes, and coastal fringe forests. A majority of the forested land is composed of loblolly pine (*Pinus taeda*). The lower slope forests are a mix of hardwood with canopy communities including sweetgum (*Liquidambar styraciflua*), white oak (*Quercus alba*), pignut hickory (*Carya glabra),* and beech *(Fagus grandifolia)*. Smaller trees mixing in with hardwoods include American holly (*Ilex opaca*) and flowering dogwood (*Cornus florida*). Inland floodplain communities of the tributary streams include swamp tupelo (*Nyssa biflora*), bald cypress (*Taxodium distichum*), red maple (*Acer rubrum*), sweetgum, and a variety of oaks. Ironwood (*Carpinus caroliniana*) is the most common mid-canopy species occurring within the forested swamp areas. Loblolly pine, live oak (*Q. virginiana*), diamond leaf oak (Q.*hemisphaerica*), yaupon (*Ilex vomitoria*), and Spanish moss (*Tillandsia usneoides*) occur along the larger tidal creek areas. Forest management practices occurring at MCAS Cherry Point include prescribed burns every 3 to 5 years and restoration to longleaf pine (*Pinus palustris*) on suitable soils. Prescribed burning is used not only to assist with military training, but also to promote native plant communities, improve wildlife habitat, and reduce potential for wildfires (MCAS Cherry Point 2001).

Wildlife. White-tailed deer (*Odocoileus virginianus*), eastern gray squirrel (*Scirus carolinensis*), black bear (*Ursus americanus),* and eastern cottontail rabbit (*Sylvilagus floridanus*) inhabit the pocosins and hardwood areas. Wetland areas are inhabited by beaver muskrat (*Ondatra zibethica*), raccoon (*Procyon lotor),* and opossum (*Didelphis virginiana*) (MCAS Cherry Point 2001).

Fifteen species of frogs and four species of salamanders inhabit the installation. The green tree frog (*Hyla cinerea*), squirrel frog (*Hyla squirella*), and southern leopard frog (*Rana sphenocephala utricularia*) are the most abundant on MCAS Cherry Point (MCAS Cherry Point 2001).

There are three ponds on MCAS Cherry Point that are regularly stocked with fish. Bartlett and Catfish ponds contain largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), redear sunfish (*Lepomis microlophus*), and channel catfish (*Ictalarus punctatus*). Hybrid striped bass (*Morone spp.)* are stocked in Duck Pond (MCAS Cherry Point 2001).

Nest boxes are established for wood ducks (*Aix sponsa*) at MCAS Cherry Point. Black ducks (*Anas rubripes*), Canada geese (*Branta canadensis*), and mallards (*Anas platyrhynchos*) also regularly nest at the installation. Many species of diving ducks occur in the open waters of Slocum and Hancock creeks and a variety of songbirds inhabit urbanized areas of MCAS Cherry Point (MCAS Cherry Point 2001).

Protected and Sensitive Species. Several protected and sensitive species could occur in the vicinity of MCAS Cherry Point, as identified in the MCAS INRMP, and USFWS and North Carolina Department of Environment and Natural Resources species lists by county (see **Table 3-19**). These species are discussed in the following paragraphs.

Terrestrial. Roughleaf loosestrife (*Lysimachia asperulaefolia*) is endemic to coastal and sandhill habitats in the Carolinas and could be found at MCAS Cherry Point. Sensitive joint-vetch (*Aeschynomene virginica*) has the potential to occur on the installation in intertidal zones that are flooded twice daily; however, it has not been identified in recent surveys (MCAS Cherry Point 2011a, USFWS 2012a).

The main station supports a breeding population of American alligator, particularly in the Hancock and Slocum creek areas. Nests have been observed along Jack's Branch (MCAS 2011b). Carolina pigmy rattlesnake (*Sistrurus miliarius miliarius*) would not be expected to frequent the main station of MCAS Cherry Point because of the low quality habitat on the installation. Timber rattlesnakes (*Crotalus horridus*) in Craven County (refered to as "canebrake" rattlesnakes regionally) have not been observed at MCAS Cherry Point but do have sufficient suitable habitat on the installation (MCAS Cherry Point 2011a).

Table 3-19. Protected and Sensitive Species that Could Occur on Main Station MCAS Cherry Point

Common Name	Scientific Name	Listed Status
Amphibians/Reptiles		
American alligator	*Alligator mississippiensis*	T (S/A)
Timber rattlesnake	*Crotalus horridus*	SSC
Carolina pigmy rattlesnake	*Sistrurus miliarius miliarius*	SSC
Birds[1]		
Bachman's sparrow	*Aimophila aestivalis*	SSC
Tricolored heron	*Egretta tricolor*	SSC
Bald eagle[2]	*Haliaeetus leucocephalus*	NL
Short-billed dowitcher	*Limnodromus griseus*	SSC
Red-cockaded woodpecker	*Picoides borealis*	E
Common tern	*Sterna hirundo*	SSC
Plants		
Sensitive joint-vetch	*Aeschynomene virginica*	T
Rough-leaved loosestrife	*Lysimachia asperulaefolia*	E

Sources: USFWS 2012a, MCAS Cherry Point 2011a, NCDENR 2012

Notes: This list is not exhaustive and is subject to change over time. The Navy would comply with any updates to species status during the implementation of this project.

1. Listed birds are also protected under the MBTA.
2. Bald eagles are not federally or state-listed species, but are protected under the Bald and Golden Eagle Protection Act.

Key:

T (S/A) = Threatened due to similarity of appearance. These species are not biologically threatened or endangered and are not subject to Section 7 consultation.

E = Endangered

NL = Not listed under the ESA

SSC = Species of Special Concern (State only)

T = Threatened

Migratory Birds. Red-cockaded woodpeckers historically occurred in longleaf pine habitat but have not been observed at MCAS Cherry Point since the 1970s. However, due to the proximity of red-cockaded woodpeckers at Croatan National Forest, this species has the potential to occur on the installation. Bald eagles have been observed nesting in a pine tree near the ordnance area on MCAS Cherry Point (MCAS Cherry Point 2011a). MCAS Cherry Point contains suitable habitat for Bachman's sparrow (*Aimophila aestivalis*), but the species has not been observed at the installation. A federally listed species (*Vermivora bachmanii*) shares the common name "Bachman's sparrow" but is presumed to be removed from North Carolina. BASH data suggests that tricolored heron, short-billed dowitcher (*Limnodromus griseus*), and common tern (*Sterna hirundo*) might be found on the main station of MCAS Cherry Point; however, the short-billed dowitcher is likely a winter resident only (MCAS Cherry Point 2011a).

MCAS Cherry Point also maintains annually renewed Migratory Bird Depredation and Special Airport Depredation permits to disperse or remove deer, birds, and other wildlife near the airfield. A Depredation

Permit for bald eagles is being pursued for eagles that could pose an imminent threat to airfield safety (MCAS Cherry Point 2011a).

3.6.3 Environmental Consequences

Ground disturbance and noise associated with construction can directly or indirectly cause adverse effects on biological resources. Direct effects from ground disturbance are evaluated by identifying the types and locations of potential ground-disturbing activities in correlation to important biological resources. Habitat removal and damage or degradation of habitats associated with ground-disturbing activities could have adverse effects on biological resources (including vegetative communities and wildlife dependent on the habitat for survival).

3.6.3.1 NAVSTA Mayport Alternative

Scenario 1 – NAVSTA Mayport

Vegetation. The terrestrial portion of the installation is highly urbanized. Vegetation within the areas designated for construction of the new support facilities is landscaped. Removed vegetation would be expected to regenerate or be replanted once construction and demolition activities have ceased. No significant impacts on vegetation would be expected from the temporary disturbances during construction, demolition, and infrastructure improvement activities (e.g., trampling, crushing, and removal) or from the permanent removal of vegetation from the construction of new facilities and infrastructure under this scenario. LCS operations would occur in the water or on pavement pierside (e.g., cargo and mission module handling); therefore, operations would not impact vegetative communities.

Wildlife. No significant impacts on nearby terrestrial wildlife (e.g., birds, mammals, reptiles, and amphibians) would be expected under the NAVSTA Mayport Scenario due to noise disturbances as a result of construction and demolition activities or the operation of the LCS. Most wildlife species in the project area would likely be habituated to high noise levels associated with construction and demolition activities (USNPS 2005). As such, the forecasted noise levels would not be expected to affect individual animals proximate to the noise sources.

The proposed construction footprint would generally occur in previously disturbed areas associated with building demolition as part of this action. Therefore, habitat removal would be negligible. Wildlife species occurring within the project area are anticipated to be common, generalist species such as raccoons, gray squirrels, and marsh rabbits. Because these species are habitat generalists, it is anticipated that displaced individuals would be able to find other suitable habitats in the vicinity. It is also anticipated that species occurring within the project area would be adapted to human disturbances and Navy activities and could become habituated to long-term disturbances from the operation of the LTF, LSF, and MMRC. Therefore, no significant impacts on wildlife would be expected under the NAVSTA Mayport Scenario.

Protected and Sensitive Species. Several protected and sensitive species occur in the vicinity of NAVSTA Mayport; however, the proposed homeporting of the LCSs at NAVSTA Mayport would result in a negligible impact on protected and sensitive species. Specific impacts on protected and sensitive species are discussed in the following paragraphs.

Terrestrial Species. Protected and sensitive terrestrial species near NAVSTA Mayport would likely be habituated to high noise levels associated with an urban setting. The contribution of noise disturbances from construction and demolition to the ambient noise environment would be negligible and short-term.

Construction would occur in a highly urbanized environment and would be associated with demolition as part of the Proposed Action. Therefore, habitat removal would be negligible for any protected or sensitive species. Operation of the LCSs would not significantly contribute to the noise environment (see **Section 3.1.3**) and would use existing equipment in a highly disturbed area that would not preclude the use of habitat by sensitive and protected species. Therefore, no significant impacts on terrestrial protected and sensitive species would be expected under the NAVSTA Mayport Scenario. Pursuant to the ESA, no effects on federally listed threatened or endangered terrestrial species would be expected from the Proposed Action.

Migratory Birds. Most migratory birds in the area (including the piping plover, bald eagle, and wood stork) would be expected to be habituated to noise disturbances associated with construction and operation under the NAVSTA Mayport Scenario because of the generally high noise environment on the installation. The contribution of noise disturbances from construction, demolition, and operational activities to the noise environment would be negligible and would not preclude the use of habitat by threatened or endangered species. No new construction or modifications would be required for handling the cargo and mission modules. Therefore, no significant impacts on migratory birds would be expected under the under NAVSTA Mayport Scenario. Pursuant to the ESA and MBTA, no effects on federally listed threatened or endangered migratory birds would be expected from the Proposed Action.

Scenario 2 – NAVSTA Mayport-NSB Kings Bay

As previously described, due to the nature of the actions proposed at Kings Bay, there are no potential impacts on biological resources, and, as such, a detailed analysis for this resource area is not provided.

3.6.3.2 NAVSTA Norfolk Alternative

Impacts from the Proposed Action would be similar to those described for the NAVSTA Mayport Scenario.

Vegetation. No significant impacts on vegetation would be expected from the temporary disturbances during construction, demolition, and infrastructure improvement activities and from the permanent removal of vegetation under this scenario. The majority of the installation is highly urbanized and vegetation within the site is generally modified and landscaped. Operation of the LCSs would occur in previously disturbed areas and would not require any new construction or modifications to handle the cargo and mission modules. Removed vegetation would be expected to regenerate or be replanted once construction and demolition activities have ceased.

Wildlife. No significant impacts on terrestrial wildlife would occur and there would be no loss of habitat. Impacts on nearby terrestrial wildlife would be similar to those expected under the NAVSTA Mayport Scenario due to noise disturbances as a result of construction, demolition, and operational activities; however, these impacts would not be considered significant. Most wildlife species in the project area would likely be habituated to high noise levels associated with the construction activities (USNPS 2005). No in-water or pier construction or additional dredging would be required for berthing the ships and no new construction or modifications would be required for handling the cargo and mission modules. Therefore, no significant impacts on wildlife would be expected under this scenario.

Protected and Sensitive Species. Several protected and sensitive species occur in the vicinity of NAVSTA Norfolk; however, the proposed homeporting of the LCSs at NAVSTA Norfolk would have a negligible impact on protected and sensitive species. Specific impacts on protected and sensitive species are discussed in the following paragraphs.

Terrestrial Species. Protected and sensitive terrestrial species near NAVSTA Norfolk would be expected to react to construction noise similarly to those under the NAVSTA Mayport Scenario. These species would likely be habituated to high noise levels associated with construction and demolition activities (USNPS 2005). The contribution of noise disturbances from construction, demolition, and operational activities to the noise environment would be negligible. Operation of the LCSs would use existing equipment in a highly disturbed area that would not preclude the use of habitat by sensitive and protected species. Therefore, no significant impacts on terrestrial protected and sensitive species would be expected under the NAVSTA Norfolk Alternative. Pursuant to the ESA, no effects on federally listed threatened or endangered terrestrial species would be expected from the Proposed Action.

Migratory Birds. Construction associated with the Proposed Action would be conducted in a manner to avoid impacts on migratory birds to the greatest extent practicable. The contribution of noise disturbances from construction, demolition, and operational activities to the noise environment would be negligible and would not preclude the use of habitat by threatened or endangered species. No new construction or modifications would be required for handling the cargo and mission modules. Most migratory birds in the area would be expected to be habituated to noise disturbances associated with construction and operation under the NAVSTA Norfolk Alternative. The LCSs would be added to an existing port with operational vessels. Operation of the LCSs would not contribute significantly to the noise environment and would not restrict habitat use. Therefore, no significant impacts on migratory birds would be expected under the under NAVSTA Norfolk Alternative. Pursuant to the ESA and MBTA, no effects on federally listed threatened or endangered migratory birds would be expected from the Proposed Action.

3.6.3.3 MCAS Cherry Point

Vegetation. No ground-disturbing activities would occur at MCAS Cherry Point (only minor building renovations), therefore no impacts on vegetation would be expected from the storage of Firescouts. No impacts from Firescout test flights would be expected because the Firescout test flights would occur in the same airspace areas in which other aircraft and UAVs are currently operating, and would not impact any other vegetation.

Wildlife. No significant impacts on terrestrial wildlife would occur and no loss of habitat would result from the storage and test flights of Firescouts. Wildlife near MCAS Cherry Point would likely be habituated to high noise levels associated with the storage and test flights of the Firescouts. As a result, habitat use would not be restricted by test flights under the Proposed Action. Noise generated from the Firescouts during test flights would likely be less than the noise generated by operations of rotory-winged aircraft that are currently at the airfield such as MV-22s, CH-53s and CH-46s. The test flights of Firescouts would also be subject to MCAS Cherry Point's BASH program that minimizes aircraft and bird/wildlife strikes through established SOPs.

The BASH plan prescribes an ongoing process that involves the distribution of information and active and passive measures to control how birds use the critical areas around the airfield. Methods outlined in the plan to reduce BASH risks include habitat management (i.e., controlling grass height, eliminating bare areas, and removing dead vegetation to maintain the runway and adjacent areas in a manner least attractive to birds), bird dispersal (i.e., horns, sirens, and bird calls used to disperse birds from the airfield), and bird avoidance. Firescout test flights would be conducted at altitudes of approximately 500 feet (152.4 meters) above ground level and would total approximately 10 to 15 hours per month of flying time for all Firescouts.

Protected and Sensitive Species. Several protected and sensitive species occur in the vicinity of MCAS Cherry Point; however, the storage and test flights of the Firescout would have a negligible impact on

protected and sensitive species. Specific impacts on protected and sensitive species are discussed in the following paragraphs.

Terrestrial Species. Protected and sensitive terrestrial species near MCAS Cherry Point would likely be habituated to high noise levels associated with Firescout test flights (USNPS 2005). The contribution of noise disturbances from test flights to the ambient noise environment would be negligible, short-term, and would not preclude the use of habitat. Therefore, no significant impacts on terrestrial protected and sensitive species would be expected at MCAS Cherry Point. Pursuant to the ESA, no effects on federally listed threatened or endangered terrestrial species would be expected from the Proposed Action.

Migratory Birds. Because test flights of the Firescout fit the definition of a military readiness activity per the MBTA, the Navy is authorized for incidental takes of migratory birds provided that the Navy adheres to the regulations set forth in § 21.15 of the MBTA (Authorization of take incidental to military readiness activities). Take of migratory birds would also be mitigated by MCAS Cherry Point's Migratory Bird Depredation and Special Airport Depredation permits, which allow the installation to disperse or remove deer, birds, and other wildlife near the airfield. Regardless, no significant effects on a population of a migratory bird species would be expected from the Firescout test flights since Firescout flights would represent a tiny fraction of the total aircraft operations on the installation and would only occur for short durations. The Navy would adhere to the MCAS Cherry Point BASH program, as described, to further prevent impacts on migratory birds. Pursuant to the ESA and MBTA, no effects on federally listed threatened or endangered migratory birds would be expected from the Proposed Action.

3.6.3.4 No Action Alternative

Under the No Action Alternative, homeporting of the LCSs would not occur on the East Coast and no construction, demolition, or infrastructure upgrades would be implemented. Conditions under each scenario would remain as they are described in **Section 3.6.2**. Therefore, no significant impacts on biological resources would be expected from the No Action Alternative.

3.7 Water Resources

3.7.1 Definitions

Water resources are natural and man-made sources of water that are available for use by and for the benefit of humans and the environment. Hydrology concerns the distribution of water-to-water resources through the processes of evapotranspiration, atmospheric transport, precipitation, surface runoff and flow, and subsurface flow. Hydrology is affected by climatic factors such as temperature, wind direction and speed, topography, and soil and geologic properties.

Groundwater. Groundwater is water that exists in the saturated zone beneath the Earth's surface and includes underground streams and aquifers. Groundwater quality and quantity are regulated under several statutes and regulations.

Surface Water. Waters of the United States are defined within the Clean Water Act (CWA), as amended, and are regulated by the USEPA and the U.S. Army Corps of Engineers (USACE) Under Section 404 of the Act. These agencies assert jurisdiction over (1) traditional navigable waters, (2) wetlands adjacent to navigable waters, (3) nonnavigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow perennially or have continuous flow at least seasonally (e.g., typically 3 months), and (4) wetlands that directly abut such tributaries.

Storm water discharges from construction activities (such as clearing, grading, excavating, and stockpiling) that disturb one or more acres, or smaller sites that are part of a larger common plan of development or sale, are regulated under the National Pollutant Discharge Elimination System (NPDES) storm water program. Prior to discharging storm water from a construction site, an NPDES permit must be obtained, which is administered by either the state (if it has been authorized to operate the NPDES storm water program) or USEPA, depending on where the construction site is located. Florida, Georgia, Virginia, and North Carolina have USEPA authorized NPDES storm water programs.

Wetlands. Wetlands are important natural systems and habitats because of the diverse biological and hydrologic functions they perform. These functions include water quality improvement, groundwater recharge and discharge, pollution mitigation, nutrient cycling, unique plant and wildlife habitat provision, storm water attenuation and storage, sediment detention, and erosion protection. Wetlands are protected as a subset of waters of the United States under Section 404 of CWA. The term "waters of the United States" has a broad meaning under the CWA and incorporates deepwater aquatic habitats and special aquatic habitats (including wetlands). The USACE defines wetlands as "those areas that are inundated or saturated with ground or surface water at a frequency and duration to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (33 CFR Part 329). EO 11990, *Protection of Wetlands* (May 24, 1977), directs agencies to consider alternatives to avoid adverse effects and incompatible development in wetlands. Federal agencies are to avoid new construction in wetlands, unless the agency finds there is no practicable alternative to construction in the wetland, and the proposed construction incorporates all possible measures to limit harm to the wetland. The Federal government, including the DOD, operates on a policy of "no net loss" of wetlands, meaning operations and activities shall avoid the net loss of size, function, or value of wetlands.

Floodplains. Floodplains are areas of low-level ground present along rivers, stream channels, large wetlands, or coastal waters. Floodplain ecosystem functions include natural moderation of floods, flood storage and conveyance, groundwater recharge, and nutrient cycling. Floodplains also help to maintain water quality and are often home to a diverse array of plants and animals. In their natural vegetated state, floodplains slow the rate at which the incoming overland flow reaches the main water body.

Flood potential is evaluated by the Federal Emergency Management Agency (FEMA), which defines the 100-year floodplain as the area that has a one percent chance of inundation by a flood event in a given year. Certain facilities inherently pose too great a risk to be in either the 100- or 500-year floodplain, such as hospitals, schools, or storage buildings for irreplaceable records. Federal, state, and local regulations often limit floodplain development to passive uses, such as recreational and preservation activities, to reduce the risks to human health and safety.

3.7.2 Existing Conditions

3.7.2.1 NAVSTA Mayport Alternative

Scenario 1 – NAVSTA Mayport

Groundwater. Three aquifers are present at NAVSTA Mayport: the water table (surficial), intermediate, and Floridan. The surficial aquifer reaches a depth of approximately 100 feet below land surface. Local precipitation recharges the surficial aquifer. Due to the unconfined nature of the surficial aquifer it can be a recipient of pollutant discharges (e.g., spills). The intermediate aquifer is confined by the low permeability sandy clay of the Hawthorn Group (a geological formation). The low permeability of the Hawthorn Group limits contamination of the intermediate aquifer from the surficial aquifer. The Floridan aquifer begins at approximately 400 feet below land surface at NAVSTA Mayport. This aquifer is the

principal source of fresh water in northeast Florida. The potentiometric surface of the Floridan aquifer is above land surface, resulting in a net upward hydraulic gradient between the Floridan and surficial aquifer. In areas where the confining layers are less impermeable, the intermediate aquifer might actually be recharged by the Floridan aquifer (USEPA 1996).

Surface Water. Major surface water bodies on and adjacent to the installation include the St. Johns River, Chicopit Bay, and Lake Wonderwood. Florida classifies the Lower St. Johns River (section of river where NAVSTA Mayport is located) as a Class III water body which has the following designated uses: recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife. The Lower St. Johns River in 1998 was included on the 303(d) list as impaired for nutrients. The river was verified as impaired by nutrients based on elevated chlorophyll-a levels (i.e., algal organic matter) in both the fresh and marine portions of the river, and was included on the verified list of impaired waters for the Lower St. Johns River Basin. Total maximum daily loads (TMDLs) were established for the allowable loadings of total nitrogen and total phosphorus to the fresh and marine portions of Lower St. Johns River. These TMDLs would restore the river so that it meets its applicable water quality criteria for nutrients and dissolved oxygen (FDEP 2006).

NAVSTA Mayport is a well-developed military facility, with most areas containing structures, impervious paved roads and parking lots; however, there are also natural land areas on the installation, with grass and trees, a waterfront, a large area of wetlands, and two large dredge spoils area. Surface water features on the installation include a large and varied drainage system with interconnected ditches and swales; infiltration areas, storm water inlets, pipes, and other flow structures, oil-water separators and storm water ponds. The 21-acre Lake Wonderwood is one of the most notable elements of the surface water system on the installation.

Surface water at NAVSTA Mayport drains mainly to the Turning Basin and St. Johns River north of the installation, Chicopit Bay west of the station, or Lake Wonderwood and a marsh area in the south of the installation. No surface water bodies are located within the proposed construction sites at NAVSTA Mayport. Within these three general flow directions, the installation has been divided into 60 drainage basins. There are 48 direct discharges either through drainage pipes or concentrated ditch flows. There are 19 drainage basins that either sheet flow to low points with no apparent outfall or sheet flow off site with no concentrated discharge point (Navy 2012c).

NAVSTA Mayport has obtained a Florida Multi-Sector Generic Permit (Permit No. FLR05A970), which authorizes the implementation of the NPDES program for industrial activities. The 5-year permit is effective from April 16, 2011, through April 15, 2016. NAVSTA Mayport must comply with all conditions of the issued permit, including development and implementation of an SWPPP. The plan identifies sources of pollution that affect the quality of storm water discharges from industrial areas associated with airfield operation and support activities. The plan also provides guidelines for the station's storm water pollution prevention program and technical procedures to prevent illicit discharges to the storm water drainage system. In addition, the station reduces pollutants in storm water discharges by implementing best management practices (BMPs) at industrial facilities. BMPs include structural modifications such as skimmer dams, spill-control gates, oil-water separators, and roof and canopy structures over waste storage areas and personnel training areas (Navy 2012c). In addition NAVSTA Mayport has a Phase II Municipal Separate Storm Sewer System permit (Permit No. FLR04E056). This permit allows for the discharge of untreated storm water runoff into local waterbodies. This permit requires the development of a storm water management plan to prevent harmful pollutants from being washed or dumped into the municipal separate storm sewer systems.

Wetlands. Approximately 1,950 acres of freshwater and tidal saltwater wetlands habitats have been identified at NAVSTA Mayport. Of this total, 1,720 acres are saltwater habitats and 230 acres are

freshwater wetland habitats. These wetland areas are characterized as salt marshes, freshwater marshes, forested swamps, and tidal streams. The majority of wetlands at NAVSTA Mayport consist of salt marsh and tidal creeks. There are no wetlands on or adjacent to the Proposed Action area (Navy 2004b); however, there are wetlands approximately 1,509 feet (460 meters) to north of the LTF project site and 689 feet (210 meters) north of the MMRC site (see **Figure 3-3**).

Floodplains. FEMA places the 100-year floodplain elevation at NAVSTA Mayport between 6 and 14 feet above mean sea level. The 500-year flood elevation is 13.2 feet above mean sea level (Navy 1997). On NAVSTA Mayport, low-lying areas adjacent to the St. Johns River and the Atlantic Ocean are subject to varying degrees of flooding (Navy 2002b). The Proposed Action is not located within the 100-year floodplain.

Scenario 2 – NAVSTA Mayport-NSB Kings Bay

As previously described, due to the nature of the actions proposed at NSB Kings Bay, there are no potential impacts on water resources, and as such, a detailed analysis for this resource area is not provided.

3.7.2.2 NAVSTA Norfolk Alternative

Scenario 1 – NAVSTA Norfolk

Groundwater. The shallow aquifer system underlying NAVSTA Norfolk is composed of the Columbia (surficial) aquifer, the Yorktown confining zone, and the Yorktown-Eastover aquifer (McFarland and Bruce 2006, Smith and Harlow 2002). The Columbia aquifer is 4 to 4.5 feet below ground surface in the vicinity of NAVSTA Norfolk. Water quality in the Columbia aquifer is poor, and the aquifer is not locally used as a source of potable water (NAVFAC 2007). The depth of the aquifer varies seasonally and during drought cycles. The Yorktown confining zone occurs across most of the coastal plain and locally obstructs groundwater flow from the surficial aquifer to the underlying Yorktown-Eastover aquifer. The Yorktown-Eastover aquifer begins several hundred feet below land surface. This feature is wedge-shaped, ranging from 100 to 200 feet thick inland to 240 to 280 feet thick at the eastern shoreline of Virginia Beach (McFarland and Bruce 2006, Smith and Harlow 2002).

The Columbia aquifer is tidally influenced and discharges to Mason Creek, the Elizabeth River, and Willoughby Bay (ATSDR 2002). Groundwater recharge in the area occurs mainly through precipitation infiltrating the Columbia aquifer. Recharge of this surficial aquifer is limited due to a shallow layer of clayey (impermeable) soil. Urban development, including paved surfaces, drains and drainage ditches, and storm water sewers also inhibit groundwater recharge in the developed areas of Norfolk (Smith and Harlow 2002).

Surface Water. NAVSTA Norfolk is in the Chesapeake Bay drainage basin and is surrounded by highly modified shorelines and dredged waterways. Major surface water bodies on and adjacent to the installation include the James River Hampton Roads Harbor, Willoughby Bay, and Mason Creek. The James River Hampton Roads Harbor and Willoughby Bay are listed as an Impaired Waters by the Virginia Department of Environmental Quality (VDEQ). The James River Hampton Roads Harbor is listed 5a due to chlorophyll-a, nutrient/eutrophication, biological indicators, and PCBs in fish tissues (VDEQ 2010). Willoughby Bay is listed 5a due to PCB in fish tissues (VDEQ 2010). A 5a classification denotes that the water body is impaired for one or more designated uses by one or more pollutants and requires that TMDLs be established for those pollutants to meet water quality standards.

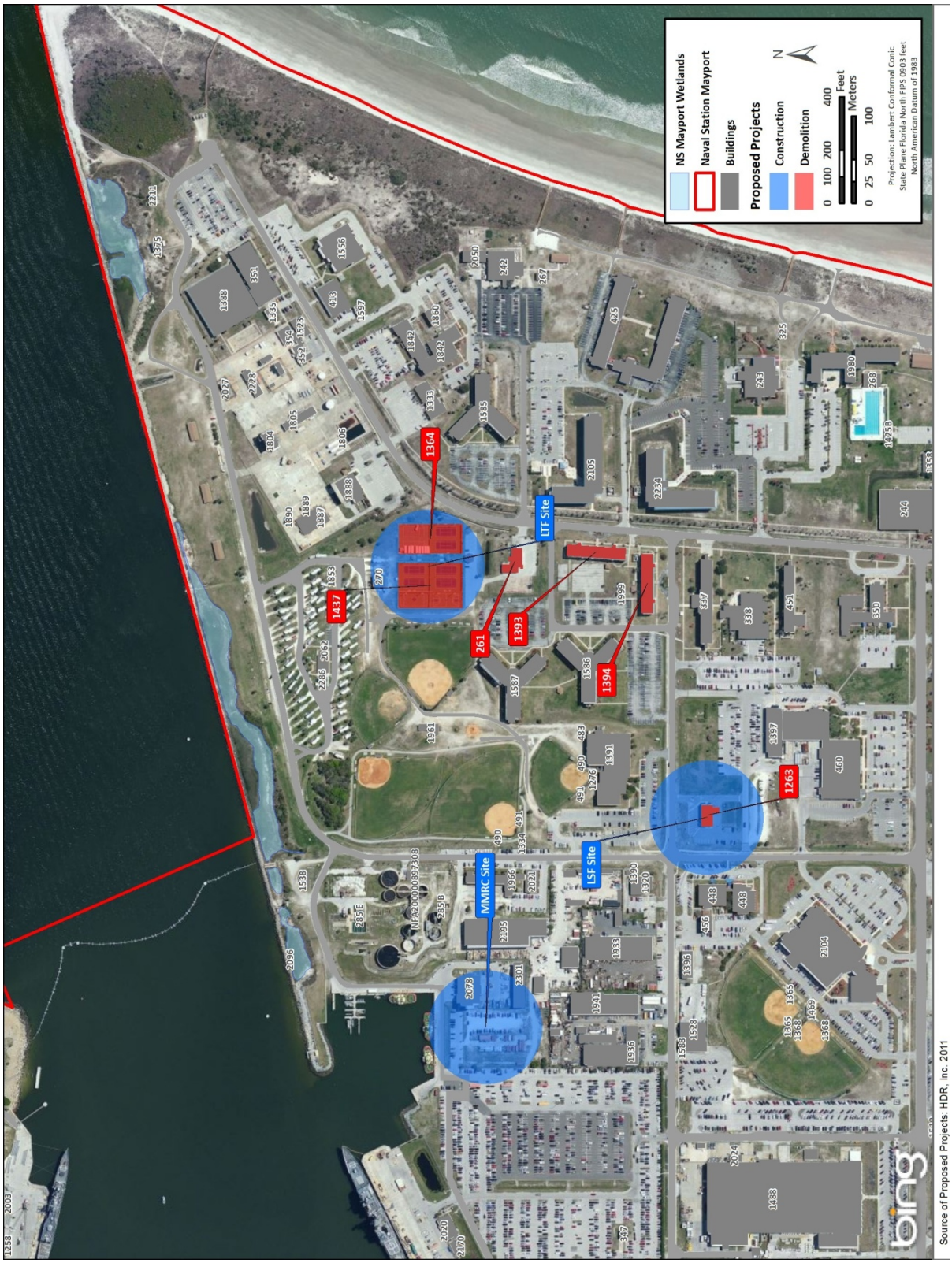

Figure 3-3. Wetlands at NAVSTA Mayport

Surface water at NAVSTA Norfolk drains mainly to Mason Creek east of the station, the James River Hampton Roads Harbor west of the station, or to the remnants of Bousch Creek in the central part of the station. Because of the proximity of the Atlantic Ocean and the low relief in the area, surface waters on the installation are tidally influenced or brackish (CH2M Hill 2005). However, no surface waterbodies are located within the proposed construction sites at NAVSTA Norfolk.

Surface runoff at the station is transported via a system of storm drainage ditches and underground culverts to Mason Creek, the James River Hampton Roads Harbor, and Willoughby Bay (CH2M Hill 2005, Garman and Harris 1997).

NAVSTA Norfolk operates under a Virginia Pollutant Discharge Elimination System permit (Permit #VA0004421) that covers approximately 35 outfalls that discharge storm water from various industrial facilities on the station. As part of the permit program, NAVSTA Norfolk has prepared an SWPPP to control storm water discharges from the station into surrounding surface waters. The plan identifies sources of pollution that affect the quality of storm water discharges from industrial areas associated with airfield operation and support activities. The plan also provides guidelines for the station's storm water pollution prevention program and technical procedures to prevent illicit discharges to the storm water drainage system. In addition, the station reduces pollutants in storm water discharges by implementing BMPs at industrial facilities. BMPs include structural modifications such as skimmer dams, spill-control gates, oil-water separators, and roof and canopy structures over waste storage areas and personnel training.

Wetlands. Approximately 100 acres of delineated wetlands exist on NAVSTA Norfolk (NAVFAC 2007). Wetlands at NAVSTA Norfolk mostly occur within the vegetated areas adjacent to the runway and taxiways at Chambers Field, along Mason Creek, and in isolated areas on the shoreline of Willoughby Bay (EDAW 2007). No wetlands are located in the vicinity of the proposed construction areas.

Floodplains. FEMA places the 100-year floodplain elevation at NAVSTA Norfolk at 8.5 feet above mean sea level. Portions of NAVSTA Norfolk adjacent to Willoughby Bay and the James River Hampton Roads Harbor are within the 100-year floodplain.

3.7.2.3 MCAS Cherry Point

Groundwater. Four aquifers are present at MCAS Cherry Point: the water table (surficial), Yorktown, Pungo River and Castle Hayne. The surficial aquifer reaches a depth of approximately 40 to 50 feet below land surface. Local precipitation recharges the surficial aquifer. Due to the unconfined nature of the surficial aquifer it can be a recipient of pollutant discharges (e.g. spills). The other aquifers have confining units that would inhibit the ability of pollutants to reach them (MCAS Cherry Point 2009a).

Surface Water. Surface waters located at MCAS Cherry Point include Alligator Gut, Cahoogue Creek, Hancock Creek, Hunters Branch, Neuse River, Reeds Gut, Slocum Creek, and Tucker Creek. All these waters are considered Class SC. The North Carolina Department of Environment and Natural Resources designates Class SC as tidal salt waters protected for secondary recreation such as fishing, boating, and other activities involving minimal skin contact; fish and noncommercial shellfish consumption; aquatic life propagation and survival; and wildlife. These waters are suitable for fish and wildlife and for secondary recreation (i.e., not considered suitable for swimming) (NAVFAC 2009b).

Storm water drainage across MCAS Cherry Point is directed to one of the surface water bodies by a series of storm sewers, drainage ditches, and tributaries. Some tidal influences are likely in Slocum Creek and Hancock Creek (MCAS Cherry Point 2009a).

MCAS Cherry Point operates under a NPDES permit (Permit #NCS000314). As part of the permit program, MCAS Cherry Point has prepared an SWPPP to control storm water discharges from the station into surrounding surface waters. The plan identifies sources of pollution that affect the quality of storm water discharges from industrial areas associated with airfield operation and support activities. The plan also provides guidelines for the station's storm water pollution prevention program and technical procedures to prevent illicit discharges to the storm water drainage system. In addition, the station reduces pollutants in storm water discharges by implementing BMPs at industrial facilities. BMPs include structural modifications such as skimmer dams, spill-control gates, oil-water separators, and roof and canopy structures over waste storage areas and personnel training.

Wetlands. Approximately 1,334 acres of delineated wetlands exist on MCAS Cherry Point (NAVFAC 2009b). There are no wetlands at the airfield.

Floodplains. Approximately 15,100 acres of MCAS Cherry Point are within the 100-year flood zone. There are no flood zones at the airfield.

3.7.3 Environmental Consequences

3.7.3.1 NAVSTA Mayport Alternative

Scenario 1 – NAVSTA Mayport

Groundwater. Heavy equipment (e.g., bulldozers, backhoes, cranes, dump trucks) and generators would be on site throughout periods of demolition and construction. Fuels, hydraulic fluids, oils, and other lubricants would be stored on site during the project to support contractor vehicles and machinery. No other materials that have a spill risk are anticipated to be stored on site during construction activities. Construction personnel would be required to follow appropriate BMPs, such as double-walled storage tanks, positioning tanks to avoid vehicular collisions, and providing vehicular protection (bollards, jersey barriers), to protect against potential petroleum or hazardous material spills. Proper housekeeping, maintenance of equipment, and containment of fuels and other potentially hazardous materials would be conducted to minimize the potential for a release of fluids into groundwater. In the event of a spill, procedures outlined in the *Oil Spill Prevention Control and Countermeasure Plan* for NAVSTA Mayport would be followed to contain and clean up a spill. No significant impacts on groundwater would be expected under the NAVSTA Mayport Scenario.

Surface Water. The implementation of NAVSTA Mayport Scenario would disturb approximately 323,000 ft^2, which could, in turn, increase erosion potential, runoff, and sedimentation within receiving surface waters during heavy precipitation events. Because this scenario includes construction of new facilities, an Environmental Resource Permit (ERP) must be obtained from the St. Johns River Water Management District. The ERP program covers the construction of new buildings, roadways, and parking areas that increase impervious surfaces and storm water runoff. The program is designed to ensure that such activities do not degrade water quality (from the discharge of untreated storm water runoff) or cause flooding (from a change in offsite runoff characteristics). This ensures that water quality is not degraded, and that wetlands and other surface waters continue to provide a productive habitat for fish and wildlife.

The ERP requires that construction occurs in a manner that will prevent flooding, manage surface water, and protect water quality. Demolition and construction debris could reach area surface waters (turning basin and St. Johns River) through wind or surface runoff; however this would be mitigated by adhering to the conditions set forth in the ERP and the installation's -Erosion-and-Sediment-Control plan for the action. The Erosion-and-Sediment-Control Plan describes who and what will control erosion and when,

where, and how this will be done. After construction is complete, applicable low-impact development storm water BMPs would be used which could result in a slight improvement in surface water as the storm water could be of a higher quality than is discharged presently. No significant impacts on surface water would be expected under the NAVSTA Mayport Scenario.

No impacts on water resources from ballast water discharge would be expected, as the Navy has established SOPs to prevent the transfer and introduction of pathogens that could impact the local ecosystem. In addition, the Marine Environmental Protection Committee of the International Maritime Organization has developed guidelines for the control of ship ballast water to prevent the introduction of unwanted aquatic organisms and pathogens. Wastewater from the LCSs would not be discharged into the area surface waters. Spills or leaks of ship fluids during docking activities would not be expected to occur, as BMPs and a spill response plan would be implemented.

Wetlands. The project is located on developed land. No wetlands occur within or immediately adjacent to the project boundaries. There are wetlands to the north of the MMRC and LTF project sites that could receive storm water runoff laden with sediment from the site; however, the use of construction BMPs and low-impact development techniques described in the *Surface Water* section would eliminate any impacts. No significant impacts on wetlands would occur under the NAVSTA Mayport Scenario.

Floodplains. No significant impacts on floodplains would occur under this NAVSTA Mayport Scenario. The project sites at NAVSTA Mayport are outside of the 100-year floodplain.

3.7.3.2 NAVSTA Norfolk Alternative

Groundwater. Heavy equipment (e.g., bulldozers, backhoes, cranes, dump trucks) and generators would be on site throughout periods of demolition and construction. Fuels, hydraulic fluids, oils, and other lubricants would be stored on site during the project to support contractor vehicles and machinery. No other materials are anticipated to be stored on site during construction activities. Construction personnel would be required to follow appropriate BMPs to protect against potential petroleum or hazardous material spills. Proper housekeeping, maintenance of equipment, and containment of fuels and other potentially hazardous materials would be conducted to minimize the potential for a release of fluids into groundwater. In the event of a spill, procedures outlined in NAVSTA Norfolk's *Spill Prevention Control and Countermeasures Plan* would be followed quickly to contain and clean up a spill. No significant impacts on groundwater would be expected under NAVSTA Norfolk Alternative.

Surface Water. The implementation of NAVSTA Norfolk Alternative would disturb approximately 323,000 ft^2, which could increase erosion potential, runoff, and sedimentation within receiving surface waters during heavy precipitation events. Demolition and construction debris could reach the surface waters through wind or surface runoff; however, the installation's Erosion-and-Sediment-Control Plan would be implemented to prevent this from occurring. The Erosion-and-Sediment-Control Plan describes how erosion will be controlled and how it will be done. After construction is complete, applicable low-impact development storm water BMPs would be used that could result in a slight improvement in surface water as the storm water could be of a higher quality than is discharged presently. No significant impacts on surface water would be expected under NAVSTA Norfolk Alternative.

No significant impacts on water resources from ballast water discharge would be expected, as the Navy has established SOPs to prevent the transfer and introduction of pathogens that could impact the local ecosystem. In addition, the Marine Environmental Protection Committee of the International Maritime Organization has developed guidelines for the control of ship ballast water to prevent the introduction of unwanted aquatic organisms and pathogens. Wastewater from the LCSs would not be discharged into the

area surface waters. Spills or leaks of ship fluids during docking activities would not be expected to occur, as BMPs and a spill response plan would be implemented.

Wetlands. The project is located on land that is currently developed. No wetlands are present within or immediately adjacent to the project boundaries and there are no wetlands that would receive storm water runoff from the site; therefore, no impacts on wetlands would be expected under the NAVSTA Norfolk Alternative.

Floodplains. No impacts on floodplains would occur under the NAVSTA Norfolk Alternative. The project area is outside of the 100-year floodplain.

3.7.3.3 MCAS Cherry Point

Groundwater. The storage of the Firescouts would occur in the existing building. Only minor building renovations would occur and no ground disturbance at MCAS Cherry Point would occur. Therefore, no impacts on the groundwater would be expected from the storage of the Firescouts. Spills resulting from mishaps related to fueling of the Firescouts could occur. In the event of a spill, procedures outlined in the *Oil Spill Prevention Control and Countermeasure Plan* for NAVSTA Mayport would be followed to contain and clean up the spill. No significant impacts on groundwater would be expected.

Surface Water. The storage of the Firescouts would occur in the existing building. Only minor building renovations would occur and no ground disturbance at MCAS Cherry Point would occur. Therefore, no impacts on the surface water would be expected from the storage of the Firescouts. Spills resulting from mishaps related to fueling of the Firescout could occur. In the event of a spill, procedures outlined in the *Oil Spill Prevention Control and Countermeasure Plan* for NAVSTA Mayport would be followed to contain and clean up the spill. No significant impacts on surface water would be expected.

Wetlands and Floodplains. Only minor building renovation activities would occur at MCAS Cherry Point. No impacts on wetlands or floodplains would occur.

3.7.3.4 No Action Alternative

Under the No Action Alternative, LCS ships would not be homeported on the East Coast of the United States. No significant impacts on water resources would occur under this alternative.

3.8 Socioeconomics and Environmental Justice

3.8.1 Definitions

Socioeconomics. Socioeconomics is defined as the basic attributes and resources associated with the human environment, particularly characteristics of population and economic activity. Demographics, employment characteristics, and housing occupancy status data provide key insights into socioeconomic conditions that might be affected by a proposed action.

The socioeconomic data shown in this section are presented at the city; Metropolitan Statistical Area or Micropolitan Statistical Area, as available; state; and national levels to characterize baseline socioeconomic conditions in the context of local, regional, state, and national trends. Metropolitan Statistical Areas and Micropolitan Statistical Areas are geographic entities defined for use by Federal statistical agencies based on the concept of a core urban area with a high degree of economic and social integration with surrounding communities. In general, the Metropolitan Statistical Area or Micropolitan

Statistical Area, as available, is used as the region of impact for this socioeconomics and environmental justice analysis. Data have been collected from previously published documents issued by Federal, state, and local agencies and from state and national databases (e.g., U.S. Bureau of Economic Analysis' Regional Economic Information System).

Environmental Justice. EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires that Federal agencies' actions substantially affecting human health or the environment do not exclude persons, deny persons benefits, or subject persons to discrimination because of their race, color, or national origin. EO 12898 was created to ensure the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no groups of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, tribal, and local programs and policies.

Consideration of environmental justice concerns includes race, ethnicity, and the poverty status of populations in the vicinity of a proposed action. Such information aids in evaluating whether a proposed action would render vulnerable any of the groups targeted for protection in the EO.

Protection of Children from Environmental Health and Safety Risks. EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, states that each Federal agency "(a) shall make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children; and (b) shall ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks."

3.8.2 Existing Conditions

3.8.2.1 NAVSTA Mayport Alternative

Scenario 1 – NAVSTA Mayport

Socioeconomics. NAVSTA Mayport is in the City of Jacksonville within Duval County, Florida. The installation is within the Jacksonville Metropolitan Statistical Area. The population of the City of Jacksonville grew 11.7 percent from 2000 to 2010. This rate of population growth for the City of Jacksonville is less than the rate of population growth for the Jacksonville Metropolitan Statistical Area and the State of Florida. The population of the Jacksonville Metropolitan Statistical Area grew 22.3 percent from 2000 to 2010 and the population of the State of Florida grew 17.6 percent from 2000 to 2010 (U.S. Census Bureau 2000a, U.S. Census Bureau 2000b, U.S. Census Bureau 2010a). Complete population data are summarized in **Table 3-20**.

Table 3-20. Population Estimates Population Estimates in State of Florida, Jacksonville Metropolitan Statistical Area, and City of Jacksonville (2000 and 2010)

Location	2000	2010	Percent Change 2000 to 2010
State of Florida	15,982,378	18,801,310	17.6
Jacksonville Metropolitan Statistical Area	1,100,491	1,345,596	22.3
City of Jacksonville	735,617	821,784	11.7

Sources: U.S. Census Bureau 2000a, U.S. Census Bureau 2000b, U.S. Census Bureau 2010a

Housing data for 2010 indicate that vacant housing units in the Jacksonville Metropolitan Statistical Area numbered approximately 74,344 or 12.4 percent of all housing units. Similar levels of housing vacancy occur within the City of Jacksonville (43,167 vacant units or 11.8 percent of all housing units). The State of Florida has a greater housing vacancy rate (17.5 percent). **Table 3-21** summarizes the vacant housing data for the City of Jacksonville, the Jacksonville Metropolitan Statistical Area, and the State of Florida.

Table 3-21. Vacant Housing Units in State of Florida, Jacksonville Metropolitan Statistical Area, and City of Jacksonville (2010)

Location	Total Units	Vacant Units	Percentage Vacant
State of Florida	8,989,580	1,568,778	17.5
Jacksonville Metropolitan Statistical Area	598,490	74,344	12.4
City of Jacksonville	366,273	43,167	11.8

Source: U.S. Census Bureau 2010a

Employment Characteristics. The total workforce in the Jacksonville Metropolitan Statistical Area is approximately 692,283 people (U.S. Census Bureau 2010b). In 2009, 24,204 people within Nassau, Duval, Clay and St. John counties were employed as active-duty or civilian personnel within the Navy (Navy 2011o). In Florida, approximately 0.4 percent of the workforce (approximately 59,099 people) is employed within the Armed Forces. The three largest industries and the corresponding percentage of the workforce employed within each for the Jacksonville Metropolitan Statistical Area are the educational, health, and social services industry (19.3 percent); the information, finance, insurance, real estate, rental, and leasing industry (13.1 percent); and the retail trade industry (12.3 percent). The construction industry represents 8.1 percent of the workforce in the Jacksonville Metropolitan Statistical Area (U.S. Census Bureau 2010b).

Annual unemployment from 2002 to 2012 in the Jacksonville Metropolitan Statistical Area ranged from a low of 2.9 percent in March 2006 to a high of 11.5 percent in January 2010. Unemployment rates in the City of Jacksonville and the State of Florida were similar to the Jacksonville Metropolitan Statistical Area. The City of Jacksonville had a low of 3.0 percent unemployment in March, April, and May 2006 and a high of 11.9 percent in July 2010. The State of Florida had a low of 3.0 percent unemployment in April 2006 and a high of 11.7 percent in August 2010 (BLS 2012).

Schools. The Duval County Public School System operates 183 public schools divided into 7 school districts and educates approximately 125,000 students throughout the greater Jacksonville, Florida, region. NAVSTA Mayport is within the Lee School District, and the area in the immediate vicinity of NAVSTA Mayport is served by Joseph Finegan Elementary, Mayport Middle School, and Duncan Fletcher High School (DCPS 2012).

Many schools in the Duval County Public School System have student enrollments that are well below their maximum capacities. For instance, the two elementary schools nearest to NAVSTA Mayport (i.e., Joseph Finegan Elementary and Mayport Elementary) are capable of servicing an additional 600 students. Other schools throughout the school system have similar available capacity for additional students (Sanders 2012).

Environmental Justice and Protection of Children. In the Jacksonville Metropolitan Statistical Area, 69.9 percent of the population is White, 21.8 percent is Black or African American, 6.9 percent of the population is Hispanic, 3.4 percent is Asian, 2.6 percent report two or more races, 1.8 percent report another race, 0.4 percent is American Indian and Alaska Native, and 0.1 percent is native Hawaiian and other Pacific Islander (see **Table 3-22**). Less than 50 percent of the populations in the City of

Jacksonville, Jacksonville Metropolitan Statistical Area, and State of Florida are within a racial minority (race other than White alone) (U.S. Census Bureau 2010a).

Table 3-22. Race, Ethnicity, and Poverty Characteristics in State of Florida, Jacksonville Metropolitan Statistical Area, City of Jacksonville, and the United States (2010)

Race and Origin	City of Jacksonville	Jacksonville Metropolitan Statistical Area	Florida	United States
Total Population	821,784	1,345,596	18,801,310	308,745,538
Percent Under 18 Years of Age	23.9	23.8	21.3	24.0
Percent over 65 Years of Age	10.6	12.1	17.3	13.0
Percent White	59.4	69.9	75.0	72.4
Percent Black or African American	30.7	21.8	16.0	12.6
Percent American Indian and Alaska Native	0.4	0.4	0.4	0.9
Percent Asian	4.3	3.4	2.4	4.8
Percent Native Hawaiian and Other Pacific Islander	0.1	0.1	0.1	0.2
Percent Other Race	2.2	1.8	3.6	6.2
Percent Two or More Races	2.9	2.6	2.5	2.9
Percent Hispanic* or Latino	7.7	6.9	22.5	16.3
Median Household Income	$48,829	$52,838	$47,661	$51,914
Percent of Families Living Below Poverty	10.5	9.0	9.9	10.1

Sources: U.S. Census Bureau 2010a, U.S. Census Bureau 2010b

Key: * = Percent Hispanic of any race.

Median household income for the Jacksonville Metropolitan Statistical Area was $52,838 in 2010, which is slightly greater than the State of Florida's median household income of $47,661. The median household income for the United States was $51,914 in 2010. The City of Jacksonville's median household income is $48,829. Families living below the poverty line follow a similar trend with the Jacksonville Metropolitan Statistical Area reporting 9.0 percent, the City of Jacksonville reporting 10.5 percent, and the State of Florida reporting 9.9 percent (U.S. Census Bureau 2010b).

The percentage of the total population who are children (i.e., individuals under 18 years of age) living within the Jacksonville Metropolitan Statistical Area is approximately 23.8 percent. This is similar to the City of Jacksonville (23.9 percent) and the State of Florida (21.3 percent) (U.S. Census Bureau 2010a).

Scenario 2 – NAVSTA Mayport-NSB Kings Bay

Socioeconomic and environmental justice conditions at NAVSTA Mayport are discussed under the NAVSTA Mayport Scenario. This section summarizes the socioeconomic and environmental justice conditions at NSB Kings Bay.

Socioeconomics. NSB Kings Bay is in the City of St. Marys in Camden County, Georgia. Camden County, Georgia, is also considered the St. Marys Micropolitan Statistical Area. The population of the City of St. Marys grew 24.4 percent from 2000 to 2010. This rate of population growth for the City of St. Marys is greater than the rate for the St. Marys Micropolitan Statistical Area and the State of Georgia. The population of the St. Marys Micropolitan Statistical Area grew 15.7 percent from 2000 to 2010, and the population of the State of Georgia grew 18.3 percent from 2000 to 2010 (U.S. Census Bureau 2000b, U.S. Census Bureau 2010a). Complete population data are summarized in **Table 3-23**.

Table 3-23. Population Estimates in State of Georgia, St. Marys Micropolitan Statistical Area, and City of St. Marys (2000 and 2010)

Location	2000	2010	Percent Change 2000 to 2010
State of Georgia	8,186,453	9,687,653	18.3
St. Marys Micropolitan Statistical Area	43,664	50,513	15.7
City of St. Marys	13,761	17,121	24.4

Sources: U.S. Census Bureau 2000b, U.S. Census Bureau 2010a

Vacant housing units in the St. Marys Micropolitan Statistical Area numbered approximately 3,067 or 14.5 percent of all housing units in 2010. Similar levels of housing vacancy occur within the City of St. Marys (13.6 percent) and the State of Georgia (12.3 percent). **Table 3-24** summarizes the vacant housing data for the City of St. Marys, the St. Marys Micropolitan Statistical Area, and the State of Georgia.

Table 3-24. Vacant Housing Units in State of Georgia, St. Marys Micropolitan Statistical Area, and City of St. Marys (2010)

Location	Total Units	Vacant Units	Percentage Vacant
State of Georgia	4,088,801	503,217	12.3
St. Marys Micropolitan Statistical Area	21,114	3,067	14.5
City of St. Marys	7,443	1,015	13.6

Source: U.S. Census Bureau 2010a

Employment Characteristics. The total workforce in the St. Marys Micropolitan Statistical Area is approximately 25,473 people. Approximately 9.2 percent of the workforce (3,450 people) within the St. Marys Micropolitan Statistical Area is employed within the Armed Forces. In Georgia, approximately 0.8 percent of the workforce (approximately 56,625 people) is employed within the Armed Forces. The three largest industries and the corresponding percentage of the workforce employed within each for the St. Marys Micropolitan Statistical Area are the educational, health, and social services industry (18.4 percent); the retail trade industry (13.1 percent); and the public administration services industry (13.4 percent). The construction industry represents 7.7 percent of the workforce in the St. Marys Micropolitan Statistical Area (U.S. Census Bureau 2010b).

Annual unemployment from 2002 to 2012 in the St. Marys Micropolitan Statistical Area ranged from a low of 3.3 percent in April 2007 to a high of 10.4 percent during 4 months of 2010. The unemployment rate in the State of Georgia was slightly higher than the unemployment rate of the St. Marys Micropolitan

Statistical Area. The State of Georgia had a low of 4.1 percent unemployment in December 2003 and a high of 10.9 percent in January 2010. Unemployment data are not available for the City of St. Marys (BLS 2012).

Schools. The Camden County School System operates 12 public schools throughout Camden County, Georgia, and educates 9,563 students. The area in the immediate vicinity of NSB Kings Bay is served by St. Marys Elementary School, St. Marys Middle School, and Camden County High School (CCS 2012).

Environmental Justice and Protection of Children. In the St. Marys Micropolitan Statistical Area, 74.4 percent of the population is White, 19.4 percent is Black or African American, 5.1 percent of the population is Hispanic, 3.0 percent report two or more races, 1.4 percent is Asian, 1.1 percent report another race, 0.5 percent is American Indian and Alaska Native, and 0.2 percent is native Hawaiian and other Pacific Islander (see **Table 3-25**). Less than 50 percent of the populations in the City of St. Marys, the St. Marys Micropolitan Statistical Area, and State of Georgia are within a racial minority (race other than White alone) (U.S. Census Bureau 2010a).

Table 3-25. Race, Ethnicity, and Poverty Characteristics in State of Georgia, St. Marys Micropolitan Statistical Area, City of St. Marys, and the United States (2010)

Race and Origin	City of St. Mary	St. Marys Micropolitan Statistical Area	Georgia	United States
Total Population	17,121	50,513	9,687,653	308,745,538
Percent Under 18 Years of Age	28.0	27.0	25.7	24.0
Percent over 65 Years of Age	10.0	9.0	10.7	13.0
Percent White	74.2	74.4	59.7	72.4
Percent Black or African American	18.7	19.4	30.5	12.6
Percent American Indian and Alaska Native	0.5	0.5	0.3	0.9
Percent Asian	1.4	1.4	3.2	4.8
Percent Native Hawaiian and Other Pacific Islander	0.1	0.2	0.1	0.2
Percent Other Race	1.7	1.1	4.0	6.2
Percent Two or More Races	3.5	3.0	2.1	2.9
Percent Hispanic* or Latino	6.0	5.1	8.8	16.3
Median Household Income	$52,526	$49,230	$49,347	$51,914
Percent of Families Living Below Poverty	8.6	12.6	11.9	10.1

Sources: U.S. Census Bureau 2010a, U.S. Census Bureau 2010b

Key: * = Percent Hispanic of any race.

Median household income for the St. Marys Micropolitan Statistical Area was $49,230 in 2010, which is similar to the State of Georgia's median household income of $49,347. The median household income for the United States was $51,914 in 2010, and the City of St. Marys median household income is $52,526. Families living below the poverty line follow a similar trend with the St. Marys Micropolitan

Statistical Area reporting 12.6 percent, the City of St. Marys reporting 8.6 percent, and the State of Georgia reporting 11.9 percent (U.S. Census Bureau 2010b).

The percentage of the total population who are children (i.e., individuals under 18 years of age) living within the St. Marys Micropolitan Statistical Area is approximately 27.0 percent. This is similar to the City of St. Marys (28.0 percent) and the State of Georgia (25.7 percent) (U.S. Census Bureau 2010a).

3.8.2.2 NAVSTA Norfolk Alternative

Socioeconomics. NAVSTA Norfolk is in the City of Norfolk, Virginia. The installation is within the Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area. The population of the City of Norfolk grew 3.6 percent from 2000 to 2010. This rate of population growth for the City of Norfolk is less than the rate for the Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area and the Commonwealth of Virginia. The population of the Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area grew 6.5 percent from 2000 to 2010, and the population of the Commonwealth of Virginia grew 13.0 percent from 2000 to 2010 (U.S. Census Bureau 2000a, U.S. Census Bureau 2000b, U.S. Census Bureau 2010a). Complete population data are summarized in **Table 3-26**.

Table 3-26. Population Estimates in the Commonwealth of Virginia, Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area, and City of Norfolk (2000 and 2010)

Location	2000	2010	Percent Change 2000 to 2010
Commonwealth of Virginia	7,078,515	8,001,024	13.0
Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area	1,569,541	1,671,683	6.5
City of Norfolk	234,403	242,803	3.6

Sources: U.S. Census Bureau 2000a, U.S. Census Bureau 2000b, U.S. Census Bureau 2010a

Vacant housing units in the Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area numbered approximately 57,725 or 8.4 percent of all housing units in 2010. Similar levels of housing vacancy occur within the City of Norfolk (9.0 percent) and the Commonwealth of Virginia (9.2 percent). **Table 3-27** summarizes the vacant housing data for the City of Norfolk, the Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area, and the Commonwealth of Virginia.

Table 3-27. Vacant Housing Units in the Commonwealth of Virginia, Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area, and City of Norfolk (2010)

Location	Total Units	Vacant Units	Percentage Vacant
Commonwealth of Virginia	3,364,939	308,881	9.2
Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area	686,297	57,725	8.4
City of Norfolk	95,018	8,533	9.0

Source: U.S. Census Bureau 2010a

Employment Characteristics. The total workforce in the Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area is approximately 904,425 people. Approximately 6.1 percent of the workforce (79,770 people) within the Virginia Beach-Norfolk-Newport News Metropolitan Statistical

Area is employed within the Armed Forces. In Virginia, approximately 2.0 percent of the workforce (approximately 122,809 people) is employed within the Armed Forces. The three largest industries and the corresponding percentage of the workforce employed within each for the Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area are the educational, health, and social services industry (21.4 percent); the retail trade industry (12.1 percent); and the professional, scientific, management, administrative, and waste management services industry (11.1 percent). The construction industry represents 7.7 percent of the workforce in the Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area (U.S. Census Bureau 2010b).

Annual unemployment from 2002 to 2012 in the Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area ranged from a low of 2.8 percent in April 2007 to a high of 8.1 percent in January 2010. Unemployment rates in the City of Norfolk and the Commonwealth of Virginia were similar to the Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area. The City of Norfolk had a low of 3.6 percent unemployment in April 2007 and a high of 9.4 percent in August 2010. The Commonwealth of Virginia had a low of 2.7 percent unemployment in April 2007 and a high of 7.8 percent in January 2010 (BLS 2012).

Schools. The Norfolk Public School System operates 48 public schools throughout the greater Norfolk, Virginia, region and educates approximately 31,000 students. For the overall Norfolk-Portsmouth-Chesapeake-Virginia Beach region, upwards of 130,000 students are enrolled in the public school system. The area in the immediate vicinity of NAVSTA Norfolk is served by multiple elementary schools including Ocean View, Oceanair, Granby, and Willoughby Elementary Schools; Northside Middle School; and Granby High School (NPS 2012). Some schools in the Norfolk Public School System have student enrollments that are below their maximum capacities, and in recent years the school system has proposed the consolidation of several underenrolled schools (Vegh 2011).

Environmental Justice and Protection of Children. In the Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area, 59.6 percent of the population is White, 31.3 percent is Black or African American, 5.4 percent of the population is Hispanic, 3.5 percent is Asian, 3.4 percent report two or more races, 1.7 percent report another race, 0.4 percent is American Indian and Alaska Native, and 0.1 percent is native Hawaiian and other Pacific Islander (see **Table 3-28**). Less than 50 percent of the populations in the Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area and Commonwealth of Virginia are within a racial minority (race other than White alone). In the City of Norfolk, more than 50 percent of the population is within a racial minority. Of the minority races reported, Black or African American has the highest percentage at 43.1 percent (U.S. Census Bureau 2010a).

Median household income for the Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area was $57,605 in 2010, which is slightly less than the Commonwealth of Virginia's median household income of $61,406. The median household income for the United States was $51,914 in 2010 and the City of Norfolk's median household income is $42,677, which is the lowest of all the areas reviewed. Families living below the poverty line in the Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area represent 7.5 percent of the population, in the City of Norfolk represent 13.5 percent of the population, and in the Commonwealth of Virginia represent 7.2 percent (U.S. Census Bureau 2010b).

The percentage of the total population who are children (i.e., individuals under 18 years of age) living within the Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area is approximately 23.6 percent. This is similar to the City of Norfolk (20.8 percent) and the Commonwealth of Virginia (23.2 percent) (U.S. Census Bureau 2010a).

Table 3-28. Race, Ethnicity, and Poverty Characteristics in the Commonwealth of Virginia, Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area, City of Norfolk, and the United States (2010)

Race and Origin	City of Norfolk	Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area	Virginia	United States
Total Population	242,803	1,671,683	8,001,024	308,745,538
Percent Under 18 Years of Age	20.8	23.6	23.2	24.0
Percent over 65 Years of Age	9.4	11.6	12.2	13.0
Percent White	47.1	59.6	68.6	72.4
Percent Black or African American	43.1	31.3	19.4	12.6
Percent American Indian and Alaska Native	0.5	0.4	0.4	0.9
Percent Asian	3.3	3.5	5.5	4.8
Percent Native Hawaiian and Other Pacific Islander	0.2	0.1	0.1	0.2
Percent Other Race	2.2	1.7	3.2	6.2
Percent Two or More Races	3.6	3.4	2.9	2.9
Percent Hispanic* or Latino	6.6	5.4	7.9	16.3
Median Household Income	$42,677	$57,605	$61,406	$51,914
Percent of Families Living Below Poverty	13.5	7.5	7.2	10.1

Sources: U.S. Census Bureau 2010a, U.S. Census Bureau 2010b

Key: * = Percent Hispanic of any race.

3.8.2.3 MCAS Cherry Point

Socioeconomics. MCAS Cherry Point is in the City of Havelock within Craven County, North Carolina. MCAS Cherry Point is within the New Bern Micropolitan Statistical Area. The population of the City of Havelock declined 7.7 percent from 2000 to 2010. The population of the New Bern Micropolitan Statistical Area and the State of North Carolina grew 10.5 and 18.5 percent from 2000 to 2010, respectively (U.S. Census Bureau 2000b, U.S. Census Bureau 2010a). Complete population data are summarized in **Table 3-29**.

Housing data for 2010 indicate that vacant housing units in the New Bern Micropolitan Statistical Area numbered approximately 7,418 or 12.9 percent of all housing units. Slightly greater levels of housing vacancy occur within the State of North Carolina (13.5 percent of all housing units). The City of Havelock has a much lower housing vacancy rate (5.9 percent). **Table 3-30** summarizes the vacant housing data for the City of Havelock, the New Bern Micropolitan Statistical Area, and the State of North Carolina.

Table 3-29. Population Estimates in the State of North Carolina, New Bern Micropolitan Statistical Area, and City of Havelock (2000 and 2010)

Location	2000	2010	Percent Change 2000 to 2010
State of North Carolina	8,049,313	9,535,483	18.5
New Bern Micropolitan Statistical Area	114,751	126,802	10.5
City of Havelock	22,442	20,735	-7.7

Sources: U.S. Census Bureau 2000b, U.S. Census Bureau 2010a

Table 3-30. Vacant Housing Units in the State of North Carolina, New Bern Micropolitan Statistical Area, and City of Havelock (2010)

Location	Total Units	Vacant Units	Percentage Vacant
State of North Carolina	4,327,528	582,373	13.5
New Bern Micropolitan Statistical Area	57,374	7,418	12.9
City of Havelock	6,810	401	5.9

Source: U.S. Census Bureau 2010a

Employment Characteristics. The total workforce in the New Bern Micropolitan Statistical Area is approximately 59,396 people. Approximately 6.4 percent of the workforce (6,292 people) within the New Bern Micropolitan Statistical Area is employed within the Armed Forces. In North Carolina, approximately 1.2 percent of the workforce (approximately 85,572 people) is employed within the Armed Forces. The three largest industries and the corresponding percentage of the workforce employed within each for the New Bern Micropolitan Statistical Area are the educational, health, and social services industry (21.6 percent); manufacturing (11.9 percent); and public administration (10.4 percent). The construction industry represents 8.0 percent of the workforce in the New Bern Micropolitan Statistical Area (U.S. Census Bureau 2010b).

Annual unemployment from 2002 to 2012 in the New Bern Micropolitan Statistical Area ranged from a low of 4.0 percent in September 2007 to a high of 11.8 percent in February 2010. Unemployment rates in the State of North Carolina were similar to the New Bern Micropolitan Statistical Area. The State of North Carolina had a low of 4.4 percent unemployment in April 2006 and a high of 12.0 percent in February 2010 (BLS 2012).

Schools. The Craven County School System operates 25 public schools and educates approximately 14,700 students throughout Craven County. MCAS Cherry Point is served by Havelock Elementary School, Havelock Middle School, and Havelock High School (The Annie E. Casey Foundation 2012).

Environmental Justice and Protection of Children. In the New Bern Micropolitan Statistical Area, 70.1 percent of the population is White, 23.0 percent is Black or African American, 5.6 percent of the population is Hispanic, 1.7 percent is Asian, 2.5 percent report two or more races, 2.1 percent report another race, 0.5 percent is American Indian and Alaska Native, and 0.1 percent is native Hawaiian and other Pacific Islander (see **Table 3-31**). Less than 50 percent of the populations in the City of Havelock, New Bern Micropolitan Statistical Area, and State of North Carolina are within a racial minority (race other than White alone) (U.S. Census Bureau 2010a).

Table 3-31. Race, Ethnicity, and Poverty Characteristics in the State of North Carolina, New Bern Micropolitan Statistical Area, City of Havelock, and the United States (2010)

Race and Origin	City of Havelock	New Bern Micropolitan Statistical Area	North Carolina	United States
Total Population	20,735	126,802	9,535,483	308,745,538
Percent Under 18 Years of Age	27.0	22.7	23.9	24.0
Percent over 65 Years of Age	4.2	16.1	12.9	13.0
Percent White	70.0	70.1	68.5	72.4
Percent Black or African American	17.4	23.0	21.5	12.6
Percent American Indian and Alaska Native	0.7	0.5	1.3	0.9
Percent Asian	2.9	1.7	2.2	4.8
Percent Native Hawaiian and Other Pacific Islander	0.3	0.1	0.1	0.2
Percent Other Race	4.0	2.1	4.3	6.2
Percent Two or More Races	4.7	2.5	2.2	2.9
Percent Hispanic* or Latino	11.6	5.6	8.4	16.3
Median Household Income	$45,316	$43,534	$45,570	$51,914
Percent of Families Living Below Poverty	10.5	11.2	11.4	10.1

Sources: U.S. Census Bureau 2010a, U.S. Census Bureau 2010b

Key: * = Percent Hispanic of any race.

Median household income for the New Bern Micropolitan Statistical Area was $43,534 in 2010, which is slightly less than the State of North Carolina and City of Havelock's median household incomes of $45,570 and $45,316, respectively. The median household income for the United States was $51,914 in 2010. Families living below the poverty line follow a similar trend with the New Bern Micropolitan Statistical Area reporting 11.2 percent, the City of Havelock reporting 10.5 percent, and the State of North Carolina reporting 11.4 percent (U.S. Census Bureau 2010b).

The percentage of the total population who are children (i.e., individuals under 18 years of age) living within the New Bern Micropolitan Statistical Area is approximately 22.7 percent. This is similar to the State of North Carolina (23.9 percent) but lower than the City of Havelock (27.0 percent) (U.S. Census Bureau 2010a).

3.8.3 Environmental Consequences

Socioeconomics. The significance of socioeconomic effects is assessed in terms of direct and indirect effects on the local economy and related effects on other socioeconomic resources (e.g., income, housing, and employment). The magnitude of potential effects can vary greatly, depending on the location of a proposed action. For example, implementation of an action that creates 10 employment positions might be unnoticed in an urban area, but could have significant effects in a rural community.

Environmental Justice. Ethnicity and poverty data are examined for the local area and compared to appropriate statistics to determine if a low-income or minority population could be disproportionately affected by the Proposed Action. This section also evaluates effects from the Proposed Action on children's environmental health and safety risks.

3.8.3.1 NAVSTA Mayport Alternative

Scenario 1 – NAVSTA Mayport

Socioeconomics. A total of approximately 1,700 additional personnel would be stationed at NAVSTA Mayport. For purposes of this analysis, it is estimated that each of the approximately 1,700 personnel would be accompanied by 1.12 family members. Therefore, the total number of people (Navy personnel [1,700 people] and their family members [1,904 people]) that would move to the Jacksonville Metropolitan Statistical Area is estimated to be approximately 3,600 people. This would represent an increase of approximately 0.27 percent in the total population of the Jacksonville Metropolitan Statistical Area. Therefore, no significant impacts on demographics would occur under NAVSTA Mayport Scenario.

For purposes of this EA, it is assumed that all of the approximately 1,700 personnel and their family members would obtain non-Navy housing off-installation in the Jacksonville metropolitan area. No additional Navy housing would be constructed on-installation. Based on 2010 data, the demand for 1,700 housing units in the Jacksonville metropolitan area would represent 2.3 percent of all vacant housing units in the Jacksonville Metropolitan Statistical Area. Since data from 2010 indicate that 12.4 percent of the housing units in the Jacksonville Metropolitan Statistical Area are vacant, a 2.3 percent increase would not cause an adverse impact. Increases in housing demand would result in the reduction of current vacant housing stock and, subsequently, increases in property tax receipts and potential increases in the value of houses. No significant impacts on the housing market in the Jacksonville metropolitan area would be expected under NAVSTA Mayport Scenario.

Employment Characteristics. The construction of the proposed facilities and demolition of the existing buildings would stimulate the local economy through increases in payroll taxes, sales receipts, and the indirect purchase of goods and services. Construction and demolition workers likely would be existing local residents. As of 2010, approximately 8.1 percent of the workforce of the Jacksonville Metropolitan Statistical Area was employed in the construction industry. Therefore, there would be sufficient local workers available for the proposed construction and demolition activities. Short-term increases in local business volume within the local economy would be expected due to the purchase of construction materials, supplies, and other related services. The effects from construction and demolition activities would be temporary and not significant.

As stated in **Section 3.8.2.1**, the total workforce in the Jacksonville Metropolitan Statistical Area is approximately 692,283 people. The additional 1,700 personnel would represent an approximate 0.25 percent increase in the current workforce in the Jacksonville Metropolitan Statistical Area. Employment of the spouses and children of the additional personnel and the increase in payroll taxes would stimulate the local economy under NAVSTA Mayport Scenario; however, these effects would not be significant.

Schools. For purposes of this analysis, it is estimated that each of the approximately 1,700 personnel would be accompanied by approximately dependent family members, or 1,900 additional people. This number represents both spouses and children; therefore, some of the family members can be assumed to be school-aged children but an exact number cannot be determined. However, to predict the maximum potential impacts on enrollment in the school system, even if the entire 1,900 persons represented school-

aged children, the total would represent only 1.5 percent of the current public school enrollment for the Duval County School System.

The Duval County School System would be able to absorb this potential increase in student enrollment because many schools are well below maximum capacity. Assuming an approximately even age distribution for these students (1,900 students divided by 12 grades = 158 students) and an even enrollment distribution within the 50 schools closest to NAVSTA Mayport (158 students divided by 50 schools = 3.16 students), there would be an addition of approximately 3 students on average in each grade per school. Assuming an even enrollment distribution within all 183 schools in the Duval County School System (158 students divided by 183 schools = 0.86 students), there would be an addition of less than 1 student on average in each grade per school. The new student enrollees would reside in existing on-installation Navy housing or existing vacant housing in the Jacksonville metropolitan area for which the Duval County School System already provides school service. Therefore, the NAVSTA Mayport Scenario would not increase the potential maximum number of students that the Duval County School System is required to educate. No significant impacts on schools in Jacksonville would be expected from the increase in school-aged children associated with the increased personnel at NAVSTA Mayport.

Environmental Justice and Protection of Children. The Jacksonville Metropolitan Statistical Area contains a lower percentage of families living below the poverty level in comparison to the State of Florida. The activities would occur entirely at NAVSTA Mayport, and as noted in **Section 3.1.3.1**, noise that extends into the nearby residential areas in the vicinity of the installation would be less than 50 dBA and restricted to normal working hours. Therefore, the NAVSTA Mayport Scenario would not disproportionately impact minority or low-income populations in off-installation areas. Similarly, there are no environmental health and safety risks identified that would disproportionately affect populations of children. Therefore, no significant impact on environmental justice would be expected under NAVSTA Mayport Scenario.

Scenario 2 – NAVSTA Mayport-NSB Kings Bay

Impacts at NAVSTA Mayport would be the same as discussed in the previous section under the NAVSTA Mayport Scenario. The following paragraphs discuss the impacts at NSB Kings Bay.

Socioeconomics. A total of approximately 30 personnel would be stationed at NSB Kings Bay. For purposes of this analysis, it is estimated that each of these personnel would be accompanied by approximately 1.12 family members. Therefore, the total number of people (Navy personnel [30 people] and their family members [34 people]) that would move to the St. Marys Micropolitan Statistical Area is estimated to be 64 people. This would represent an increase of approximately 0.1 percent in the total population of the St. Marys Micropolitan Statistical Area. As a result, no significant impacts on demographics from the NSB King Bay Scenario would be expected.

For purposes of this EA, it is assumed that all of the personnel and their family members would obtain non-Navy housing off-installation. No additional Navy housing would be constructed on-installation. The demand for 30 housing units in the St. Marys metropolitan area would represent 1.0 percent of all vacant housing units in the St. Marys Micropolitan Statistical Area according to 2010 data. Since these data indicates that 14.5 percent of the housing units are vacant, a 1.0 percent increase would not cause an adverse impact. Increases in housing demand would result in the reduction of current vacant housing stock and, subsequently, increases in property tax receipts and potential increases in the value of houses. No significant impacts on the housing market in the St. Marys metropolitan area would be expected.

Employment Characteristics. While no building construction or demolition would occur at NSB Kings Bay, minor improvements to existing buildings could include interior renovation and exterior site

improvements (i.e., landscaping, installation of new signage, and repairs to existing slab and asphalt concrete). A slight increase in employment, payroll taxes, sales receipts, and the indirect purchase of goods and services would be expected under the NSB Kings Bay Scenario; however, these impacts would not be considered significant.

As stated in **Section 3.8.2.1**, the total workforce in the St. Marys Micropolitan Statistical Area is approximately 25,473 people. The additional 30 personnel would represent an approximate 0.1 percent increase in the current workforce in the St. Marys Micropolitan Statistical Area. Employment of the spouses and children of these personnel and the increase in payroll taxes would stimulate the local economies; however, these effects would not be significant.

Schools. The maximum number of school-aged children assumed to move to the St. Marys Micropolitan Statistical Area as part of the LCS homeporting is estimated to be 34. For NSB Kings Bay, this would represent approximately 0.36 percent of the current public school enrollment for the Camden County School System.

The Camden County School System would be able to absorb this negligible potential increase in student enrollment. Assuming an approximately even age distribution for these students and an even enrollment distribution within the 12 schools of the Camden County School System, there would be an addition of approximately 0.2 students on average in each grade per school. The new student enrollees would reside in existing on-installation Navy housing or existing vacant housing in the St. Marys Micropolitan Statistical Area for which the Camden County School System already provides school service. Therefore, the NSB Kings Bay Scenario would not increase the potential maximum number of students that the Camden County School System is required to educate. No significant impacts on schools in the St. Marys Micropolitan would be expected from the increase in school-aged children associated with the increased personnel at NSB Kings Bay.

Environmental Justice and Protection of Children. The St. Marys Micropolitan Statistical Area contains a lower minority population in comparison to the State of Georgia. The St. Marys Micropolitan Statistical Area has a higher percentage of families living below the poverty level in comparison to the State of Georgia. The activities at NSB Kings Bay would occur entirely on the installation and would not extend into the residential areas. Therefore, the NSB Kings Bay Scenario would not disproportionately impact minority or low-income populations in off-installation areas. Similarly, there are no environmental health and safety risks identified that would disproportionately affect populations of children. Therefore, no significant impact on environmental justice would be expected under NSB Kings Bay Scenario.

3.8.3.2 NAVSTA Norfolk Alternative

Socioeconomics. Approximately 1,700 additional personnel would be stationed at NAVSTA Norfolk under the NAVSTA Norfolk Alternative. For purposes of this analysis, it is estimated that each of the approximately 1,700 personnel would be accompanied by approximately 1.12 family members. Therefore, the total number of people (Navy personnel [1,700 people] and their family members [1,904 people]) that would relocate to the Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area as part of the NAVSTA Norfolk Alternative is estimated to be approximately 3,600 people. This would represent an increase of approximately 0.22 percent in the total population of the Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area. No significant impacts on demographics would occur from the NAVSTA Norfolk Alternative.

For purposes of this EA, it is assumed that all of the personnel and their family members would obtain non-Navy housing off-installation in the Norfolk metropolitan area. No additional Navy housing would

be constructed on-installation as part of the NAVSTA Norfolk Alternative. According to 2010 data, the demand for 1,700 housing units in the Norfolk metropolitan area would represent 2.9 percent of all vacant housing units in the Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area. Since data from 2010 indicate that 8.4 percent of the housing units in the Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area are vacant, a 2.9 percent increase would not cause an adverse impact. Increases in housing demand would result in the reduction of current vacant housing stock and, subsequently, increases in property tax receipts and potential increases in the value of houses. No significant impacts on the housing market in the Norfolk metropolitan area would be expected.

Employment Characteristics. The construction of the proposed LCS support facilities would stimulate the local economy through increases in payroll taxes, sales receipts, and the indirect purchase of goods and services. Construction workers likely would be existing local residents. As of 2010, approximately 7.7 percent of the workforce of the Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area was employed in the construction industry. Therefore, there would be sufficient local workers available for the proposed construction activities. Short-term increases in local business volume within the local economy would also be expected due to the purchase of construction materials, supplies, and other related services. No significant impacts from construction activities would be expected.

As stated in **Section 3.8.2.2**, the total workforce in the Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area is approximately 904,425 people. The approximately 1,700 personnel associated with the NAVSTA Norfolk Alternative would represent a 0.18 percent increase in the current workforce in the Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area. Employment of the spouses and children of these personnel and the increase in payroll taxes would stimulate the local economy under NAVSTA Norfolk Alternative; however, these effects would not be significant.

Schools. For purposes of this analysis, it is estimated that each of the approximately 1,700 personnel would be accompanied by approximately 1.12 dependent family members, or 1,900 additional people. This number represents both spouses and children; therefore, some of the family members can be assumed to be school-aged children but an exact number cannot be determined. However, to predict the maximum potential impacts on enrollment in the school system, even if the entire 1,900 persons represented school-aged children, the total would represent only 1.5 percent of the current public school enrollment for the Norfolk-Portsmouth-Chesapeake-Virginia Beach region.

The school districts in the Norfolk-Portsmouth-Chesapeake-Virginia Beach region would be able to absorb this potential increase in student enrollment because many schools are well below maximum capacity. Assuming an approximately even age distribution for these students (1,900 students divided by 12 grades = 158 students) and an even enrollment distribution within the 48 schools of the Norfolk Public School System (158 students divided by 48 schools = 3.3 students), there would be an addition of approximately 3 students on average in each grade per school. Assuming an even enrollment distribution within all schools in the Norfolk-Portsmouth-Chesapeake-Virginia Beach region, there would be an addition of approximately 1 student on average in each grade per school. The new student enrollees would reside in existing on-installation Navy housing or existing vacant housing in the Norfolk-Portsmouth-Chesapeake-Virginia Beach metropolitan area for which the school districts already provide school service. Therefore, the school systems in the Norfolk-Portsmouth-Chesapeake-Virginia Beach metropolitan area are already required to educate residents where the new student enrollees would be housed. No significant impacts on schools in the Norfolk-Portsmouth-Chesapeake-Virginia Beach region would be expected from the increase in school-aged children associated with the NAVSTA Norfolk Alternative.

Environmental Justice and Protection of Children. The Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area contains a higher minority population in comparison the Commonwealth of

Virginia. The Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area has a slightly higher percentage of families living below the poverty level compared to the Commonwealth of Virginia. The activities associated with the NAVSTA Norfolk Alternative would occur entirely at NAVSTA Norfolk, and, as noted in **Section 3.1.3.2**, noise that extends into the nearby residential areas in the vicinity of the installation would be approximately 55 dBA and restricted to normal working hours. Therefore, this alternative would not disproportionately impact minority or low-income populations in off-installation areas. Similarly, there are no environmental health and safety risks identified that would disproportionately affect populations of children. Therefore, no significant impact on environmental justice would be expected under the NAVSTA Norfolk Alternative.

3.8.3.3 MCAS Cherry Point

Socioeconomics. Approximately 30 additional personnel would be stationed at MCAS Cherry Point. For purposes of this analysis, it is estimated that each of the approximately 30 personnel would be accompanied by 1.12 family members. Therefore, the total number of people (Navy personnel [30 people] and their family members [34 people]) that would relocate to the New Bern Micropolitan Statistical Area is estimated to be 64 people. This would represent an increase of approximately 0.05 percent in the total population of the New Bern Micropolitan Statistical Area. Therefore, no significant impacts on demographics would occur.

Housing for the increased personnel and their family members would be non-installation housing off installation in the New Bern Micropolitan Statistical Area. According to 2010 data, the demand for 30 housing units in the New Bern metropolitan area would represent 0.4 percent of all vacant housing units in the New Bern Micropolitan Statistical Area. Increases in housing demand would result in the reduction of current vacant housing stock and, subsequently, increases in property tax receipts and potential increases in the value of houses. No significant impacts on the housing market in the New Bern Micropolitan Statistical Area would be expected.

Employment Characteristics. As stated in **Section 3.8.2.3**, the total workforce in the New Bern Micropolitan Statistical Area is approximately 59,396 people. The approximately 30 personnel associated would represent an approximate 0.05 percent increase in the current workforce in the New Bern Micropolitan Statistical Area. Employment of the spouses and children of the 30 personnel and the increase in payroll taxes would stimulate the local economy; however, these effects would not be significant.

Minor building renovations at MCAS Cherry Point are not expected to stimulate the local economy significantly. Short-term increases in local business volume within the local economy would be expected due to the purchase of construction materials, supplies, and other related services. The effects from renovation activities would be temporary and not significant.

Schools. For purposes of this analysis, it is estimated that each of the approximately 30 personnel would be accompanied by approximately 1.12 dependent family members, or 34 additional people. This number represents both spouses and children; therefore, some of the family members can be assumed to be school-aged children but an exact number cannot be determined. However, to predict the maximum potential impacts on enrollment in the school system, even if the entire 34 persons represented school-aged children, the total would represent only 0.2 percent of the current public school enrollment for the Craven County School System.

The Craven County School System would be able to absorb this negligible potential increase in student enrollment. Assuming an approximately even age distribution for these students and an even enrollment distribution within the 25 schools of the Craven County School System, there would be an addition of

approximately 0.1 students on average in each grade per school. The new student enrollees would reside in existing vacant housing in the New Bern Micropolitan Statistical Area for which the Craven County School System already provides school service. Therefore, the Craven County School System is already required to educate residents where the new student enrollees would be housed. No significant impacts on schools in the New Bern Micropolitan Statistical Area would be expected from the increase in school-aged children associated with the Proposed Action.

Environmental Justice and Protection of Children. The New Bern Micropolitan Statistical Area contains a slightly lower minority population as compared to the State of North Carolina. The New Bern Micropolitan Statistical Area has a slightly lower percentage of families living below the poverty level compared to the State of North Carolina. Since only minor renovation activities would occur on the installation and as noted in **Section 3.1.3.3**, noise would not extend into the nearby residential areas. Therefore, these activities would not disproportionately impact minority or low-income populations in off-installation areas. Similarly, there are no environmental health and safety risks identified that would disproportionately affect populations of children. Therefore, no significant impact on environmental justice would be expected.

Firescout test flights would be conducted in local airspace at MCAS Cherry Point and add up to 10 to 15 hours of flight operations per month. The test flights would consist of preprogrammed profiles, similar to those of other existing manned and unmanned helicopters at MCAS Cherry Point, which could be over land or over water depending on air traffic and weather considerations. Therefore, no minority or low-income populations would be disproportionately impacted by Firescout test flights. Similarly, there are no environmental health and safety risks identified that would disproportionately affect populations of children.

3.8.3.4 No Action Alternative

Under the No Action Alternative, the LCS ships would not be homeported on the East Coast of the United States. Existing socioeconomic and environmental justice resource conditions would continue as described at **Section 3.8.2**. Socioeconomic conditions would continue to change due to local, regional, and national actions and trends.

3.9 Utilities, Infrastructure, and Transportation

3.9.1 Definitions

Infrastructure consists of the systems and physical structures that enable a population in a specified area to function. Infrastructure is wholly man-made, with a high correlation between the type and extent of infrastructure and the degree to which an area is characterized as “urban” or developed. The availability of infrastructure and its capacity to support growth are generally regarded as essential to the economic growth of an area. The infrastructure components to be discussed in this section include utilities, transportation, and solid waste management.

Utilities include electrical supply, water supply, sanitary sewer and wastewater, natural gas supply, storm water drainage, and liquid fuel supply. Transportation includes major and minor roadways that feed into the installation, security gates, roadways, and parking areas on the installation. Public transit, rail, and pedestrian networks are also elements of transportation. Solid waste management primarily relates to the availability of landfills to support a population’s residential, commercial, and industrial needs.

3.9.2 Existing Conditions

3.9.2.1 NAVSTA Mayport Alternative

Scenario 1 – NAVSTA Mayport

Electrical Supply. NAVSTA Mayport purchases electrical power from the Jacksonville Electric Authority (JEA). Electricity is produced primarily by the Northside Generating station and J. Dillon Kennedy Generation station and is distributed through an extensive system of underground and overhead transmission lines. NAVSTA Mayport receives electrical power through the JEA substation located south of the main gate at the northwest corner of Mayport Road and Wonderwood Drive (Navy 2008). The electrical capacity available to the installation is approximately 50,000 megawatt-hours (MWh). NAVSTA Mayport consumes an average of 18,000 MWh per year (NAVFAC LANT 2008).

Water Supply. NAVSTA Mayport receives water from the automated water plant that is operated by the NAVFAC Southeast Regional Base Operating Services contractor. The plant is capable of and permitted to treat 10 million gallons per day (MGD) of water. Demand for potable water at NAVSTA Mayport is approximately 2.3 MGD (this number depends on the number of ships in port) (Navy 2008).

Natural Gas Supply. Natural gas at NAVSTA Mayport is provided, operated, and maintained by TECO Peoples Gas. Commander Navy Installations Command and NAVFAC Southeast are the primary customers of natural gas on the installation. Commander Navy Installations Command uses natural gas for boilers in their buildings for hot water and NAVFAC Southeast uses natural gas for producing steam at plants (Vidrine 2012).

Sanitary Sewer and Wastewater. The on-installation Domestic Wastewater Treatment Plant is operated by the NAVFAC Southeast Regional Base Operating Services contractor. The Domestic Wastewater Treatment Plant provides secondary treatment of domestic and light industrial wastewater with a permitted design capacity of 2.0 MGD. Current operations average 0.8 MGD. The average daily generation of wastewater varies with the number of ships in port, but is currently loaded at approximately 42 percent of the permitted capacity. Many of the piers are equipped with risers that use gravity flow and force main collection systems to pump wastewater from ships. The Domestic Wastewater Treatment Plant collection system consists of multiple lift stations that pump into a primary pumping station (Navy 2008). Oily Waste-Waste Oil disposal is available at all pier risers at NAVSTA Mayport. This wastewater is collected at the Oily Wastewater Treatment Plant located on NAVSTA Mayport. The Oily Wastewater Treatment Plant currently treats an average of 105,500 gallons per day.

Storm Water Drainage. NAVSTA Mayport has an interconnected network of storm water drainage composed of ditches and swales, infiltration areas, storm water inlets, pipes, and other flow structures that carry water northerly into St. Johns River, southerly into Lake Wonderwood, and westerly towards Chicopit Bay. NAVSTA Mayport is subject to different types of storm water programs to regulate and manage various discharges; these programs include the multi-sector general permit, Municipal Separate Storm Sewer Systems, and the construction generic permit (Navy 2008).

Liquid Fuel Supply. Fuel is provided to NAVSTA Mayport by the Navy Fuel Depot in Jacksonville. Diesel fuel marine and jet petroleum fuel (JP-5) are transported to NAVSTA Mayport on barges and stored in storage tanks for distribution via underground fuel lines. The on-installation fuel depot has two 1,680,000 gallon diesel fuel marine storage tanks and two 630,000 gallon JP-5 storage tanks. Fuel distribution lines supply diesel fuel marine to all wharves and JP-5 to Wharves B and C only (Navy 2008).

Transportation. The primary roadways that provide vehicle access to NAVSTA Mayport are Mayport Drive (also referred to as Maine Street) via Atlantic Boulevard, Wonderwood Drive, Moale Avenue, and Ocean Street. Atlantic Boulevard and Wonderwood Drive are both major west-east arterial roadways that provide the most frequently transited routes to the installation. Wonderwood Drive carries approximately 13,400 vehicles per day (Navy 2008). Mayport Drive, which becomes Maine Street within the Main Gates, provides arterial north-south traffic flow through the installation and carries approximately 19,500 vehicles per day. Moale Avenue is a major roadway that carries traffic west-east on the installation. Ocean Street borders the northwestern portion of the installation and provides access through Gate 5 (Navy 2008). Access to the installation is available in three locations (Main Gate, Seminole Gate, and Gate 5). No roadways that provide access to NAVSTA Mayport have been identified as problem or constrained corridors by the North Florida Transportation Planning Organization (MPO 2006, NFTPO 2009).

NAVSTA Mayport is also available via public transportation. The Jacksonville Transportation Authority operates a city bus service that stops at eight different route stops throughout NAVSTA Mayport (Navy 2008).

Solid Waste Management. Solid waste generated at NAVSTA Mayport is collected and transported to the Trail Ridge Landfill by the NAVFAC Southeast Regional Base Operating Services contractor. The Trail Ridge Landfill is 977 acres (120.5 hectares [ha]) and has been in operation since 1992. As a Class I landfill, it can accept up to 5,000 tons of solid waste per day; however, currently the landfill receives approximately 2,500 to 3,000 tons of solid waste each day. The Trail Ride Landfill has a 14-year life expectancy and is owned by the City of Jacksonville and Waste Management (WM undated).

Scenario 2 – NAVSTA Mayport-NSB Kings Bay

As previously described, due to the nature of the actions proposed at NSB Kings Bay, there are no potential impacts on utilities, infrastructure, and transportation, and as such, a detailed analysis for this resource area is not provided.

3.9.2.2 NAVSTA Norfolk Alternative

Electrical Supply. Electric power is provided to NAVSTA Norfolk through Dominion Virginia Power. NAVSTA Norfolk calculates the average electricity consumption on station every 13 months, which is an average of 64,400 MWh per period. An estimated consumption of 29,800 MWh is used for the piers (NAVFAC LANT 2008).

Water Supply. The water distribution system on NAVSTA Norfolk is maintained by the Navy Public Works Center, Utilities Department, which serves a population of approximately 45,000 people. Potable water is provided by the City of Norfolk. In FY 2010 average daily consumption was 2.52 MGD (NAVFAC 2011b). NAVSTA Norfolk has approximately 3,700,000 gallons of water storage capacity in five different tanks. The City of Norfolk treats approximately 72 MGD.

Natural Gas Supply. Natural gas is supplied to NAVSTA Norfolk by Virginia Natural Gas. Natural gas is used to heat some buildings at the installation and is gradually replacing steam as various buildings undergo renovation. Due to deficiencies in the installation's steam distribution system, natural gas heating is more energy-efficient than steam-based heating. In calendar year 2011, NAVSTA Norfolk purchased 1,088 million cubic feet of natural gas (Norfolk 2011).

Sanitary Sewer and Wastewater. NAVSTA Norfolk is provided sanitary sewer services by the Hampton Roads Sanitation District. Hampton Roads Sanitation District services approximately 1.6 million people

in 17 counties and cities with a total of 104 pump stations at a combined capacity of 249 MGD (HRSD undated). Sanitary sewage service is provided to piers via sewer outlets that are used during the offloading of sanitary sewage from berthed ships. Oily Waste-Waste Oil collection is maintained by Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic Utilities Department. Oil reclamation and biological treatment is accomplished at the Craney Island Oily Waste-Waste Oil treatment plant, which has a daily flow of 150,000 gallons per day and a capacity of 500,000 gallons (NAVFAC LANT 2008).

Storm Water Drainage. NAVSTA Norfolk uses an extensive storm water collection system, which includes gutters, culverts, ditches, and underground piping, to direct storm water into receiving channels and storm water detention basins. Storm water is discharged into the surrounding waters. NAVSTA Norfolk operates under Virginia Pollutant Discharge Elimination System permit #VA0004421 (Virginia 2007).

Liquid Fuels Supply. Liquid fuels, including diesel, gasoline, and jet fuel are supplied to the installation by contractors. Fuel is stored in aboveground and underground storage tanks. Primary uses for liquid fuels include steam generation, emergency electricity generation, aircraft, land-based vehicles, and water-based vehicles. Fuel is stored in aboveground storage tanks (ASTs) or underground storage tanks (USTs). The total AST capacity is 2,247,161 gallons and the total UST capacity is 5,181,000 gallons. NAVSTA Norfolk has a total facility capacity of 7,742,632 gallons (Navy 2010).

Transportation. The primary roadways that provide vehicular traffic to NAVSTA Norfolk include Hampton Boulevard, Granby Street, Tidewater Drive, and Terminal Boulevard. Hampton Boulevard, Granby Street, and Tidewater Drive all provide north-south arterial traffic flow to NAVSTA Norfolk. Hampton Roads Beltway (I-64) also provides north-south arterial traffic flow to this area; passing adjacent to the installation. Terminal Boulevard and Admiral Taussig Boulevard (I-564) provide west-east arterial traffic flow. I-564 passes through the center of NAVSTA Norfolk.

Within NAVSTA Norfolk, the major east-west arteries are Gilbert Street and Bellinger Boulevard. Major north-south arteries are Maryland, Bainbridge, and Decatur avenues. Vehicle access to the installation is through seven gates located at different points off I-564 and Hampton Roads Boulevard. Traffic within the vicinity of Piers 9 and 10 and along the waterfront becomes congested from development, road network patterns, and a large concentration of trucks delivering supplies to warehouse facilities and repair vehicles traveling to piers (NAVFAC LANT 2008).

In June 2007, a transportation study was conducted for NAVSTA Norfolk that provides an analysis of existing traffic conditions by the Hampton Roads Planning District Commission. The results from the analysis indicated that Admiral Taussig Boulevard, the main arterial roadway through the installation, carried the bulk of the average weekday traffic; averaging 26,756 vehicles accessing the installation in 2009 (HRPDC 2007, HRTPO 2012). NAVSTA Norfolk is also accessible by public transportation provided by Hampton Roads Transit that has bus stops at the Navy Exchange Mall, Pier 14, and Gate 5. According to the 2007 transportation study only 1 percent of NAVSTA Norfolk employees used public transportation (HRPDC 2007). There are also an estimated 25,500 parking spaces in the immediate area of the proposed location of the Norfolk Alternative (HRPDC 2007).

NAVSTA Norfolk is situated in the Port of Hampton Roads/Port of Virginia at Hampton Roads, a tributary to the Chesapeake Bay. The port encompasses elements of 21 public and private terminals and is one of the busiest commercial ports on the East Coast of the United States. At NAVSTA Norfolk, Port Services controls more than 3,100 ships' movements annually (NAVFAC LANT 2008).

Solid Waste Management. Solid waste management services for NAVSTA Norfolk are provided by the City of Norfolk Waste Management Division. This Division collects approximately 86,000 tons of refuse, bulk waste, and yard waste annually from 61,000 residences and businesses. The City of Norfolk Waste Management Division also provides weekly curbside recycling services to approximately 57,000 residences.

3.9.2.3 MCAS Cherry Point

The total number of personnel and family members that would be located at MCAS Cherry Point is approximately 64 people. No additional facilities are proposed and no modifications to existing utilities and services are proposed; as such, impacts on utilities, infrastructure and transportation would be less than significant. Therefore an analysis of utilities, infrastructure, and transportation impacts at MCAS Cherry Point has not been included.

3.9.3 Environmental Consequences

3.9.3.1 NAVSTA Mayport Alternative

Scenario 1 – NAVSTA Mayport

***Electrical Supply*.** The additional personnel under the Proposed Action would result in a slight increase in the overall demand for electricity. A temporary increase would be related to construction and demolition activities. The eventual use of the facility could result in a long-term increase in demand for electricity. The existing capacity is 50,000 MWh, and the installation currently uses about 18,000 MWh per year, which is only about one-third of the capacity. Therefore, the increase in electrical use is not expected to exceed the current capacity. No significant impacts on electrical supply would be expected at NAVSTA Mayport.

Water Supply. Additional personnel stationed at NAVSTA Mayport would result in a long-term increase in the demand for water; however, the increase in personnel would not have a significant impact on the water supply. Impacts on the water supply under the Proposed Action would be negligible because the NAVFAC Southeast Regional Base Operating Services contractor currently pumps 2.3 MGD but is capable and permitted to pump 10 MGD.

Natural Gas Supply. Impacts on natural gas would be negligible and would not be expected to be significant because the additional personnel at NAVSTA Mayport would not increase the demand for natural gas beyond current capacities. New natural gas utility lines for the MMRC annex, LTF and LSF would be connected to existing systems to support current and future mission requirements.

Sanitary Sewer and Wastewater. Long-term impacts on sanitary sewer and wastewater would be expected. The NAVFAC Southeast Regional Base Operating Services contractor, who operates the on-installation Domestic Wastewater Treatment Plant, currently is permitted to pump and treat 2.0 MGD. The Domestic Wastewater Treatment Plant currently is operating at approximately 0.8 MGD. Therefore, impacts on sanitary sewer and wastewater as a result of increased personnel at NAVSTA Mayport would not be significant.

Storm Water Drainage. The NAVSTA Mayport Scenario would increase the amount of impervious surface on the installation. The total footprint for the proposed construction is approximately 323,139 ft^2 (30,019 m^2); however, since the majority of the area proposed for construction consists of impervious surfaces already, the increase would not be anticipated to exceed existing storm water drainage capacity. No significant impacts on storm water drainage would be expected.

Liquid Fuel Supply. The NAVSTA Mayport Scenario would result in additional local demand for liquid fuels, as each LCS would be fueled prior to embarking on deployment. The Navy Fuel Depot in Jacksonville has the existing capacity to provide liquid fuels required for the LCSs. The additional demand for fuels from berthing the LCSs at NAVSTA Mayport would not be expected to exceed the capacity of the fuel farm. No significant impacts on liquid fuel supply would be expected under NAVSTA Mayport Scenario.

Transportation. As previously discussed, there would be an increase of approximately 1,700 Navy personnel under the Proposed Action. For purposes of this analysis, a 1:1 ratio of cars to Navy personnel is assumed, which would equate to an increase of approximately 1,700 additional vehicles which would be travelling to and from the installation. The increase in personnel and subsequent increase in vehicles would be phased in over an 8-year period, as the LCSs are homeported between FY 2013 and FY 2020. The added number of vehicles would result in additional trips along major roadways within and adjoining NAVSTA Mayport; however, not all of these vehicles would be driven to the installation at the same time. Major access roads such as Mayport Drive/Maine Street would carry the vehicles to and from the installation and could experience additional congestion. The North Florida Transportation Planning Organization did not identify any roadways that provide access to NAVSTA Mayport as corridors that are congested or as being over the roadway capacity in a 2006 report (MPO 2006). No roadways in this area have been identified as having future capacity problems (NFTPO 2009). Given that more than 19,500 vehicles per day already use Mayport Drive/Maine Street, the additional, intermittent vehicles would represent a small percentage of the existing traffic. In addition, with varying work schedules, deployments, mass transit options, and carpooling, the additional vehicle trips would be intermittent, and a significant increase in traffic congestion would not be expected. The vehicles used by the family members of military personnel would be driven to NAVSTA Mayport occasionally and would be expected to use varying roadways at various times. Therefore, no significant impacts on transportation would be expected from the personnel stationed at NAVSTA Mayport and their family members residing in the surrounding Jacksonville metropolitan area.

According to the 2006 transportation study, there was no indication of a parking shortage on the installation. No impacts on parking availability at NAVSTA Mayport would be expected.

Solid Waste Management. Increases in solid waste associated with the renovation activities would be minimal and temporary in nature, and would be disposed of in accordance with relevant Federal, state, and local regulations. Renovation materials would be recycled or reused to the maximum extent practicable. Renovation debris that could not be recycled or reused would be taken off-installation to an approved construction and demolition landfill within the vicinity of NAVSTA Mayport. Therefore, no significant impacts on solid waste management would be expected at NAVSTA Mayport.

The addition of approximately 1,700 installation personnel represents a 10.6 percent increase from the 2008 population at NAVSTA Mayport (Navy 2008). Currently, on average, the landfill receives less solid waste than is permitted. Therefore, the 10.6 percent population increase would result in a negligible increase in the amount of solid waste generated. In port, solid waste and recyclables generated onboard the LCSs would be transferred onshore for offsite disposal and recycling. The slight increase in the amount of solid waste generated from the increase in personnel would not be expected to exceed the capacity of existing solid waste disposal facilities.

Scenario 2 – NAVSTA Mayport-NSB Kings Bay

As described in **Section 3.9.2.1**, due to the nature of the actions proposed at Kings Bay, there are no potential impacts to utilities, infrastructure, and transportation, and as such, a detailed analysis for this resource area is not provided.

3.9.3.2 NAVSTA Norfolk Alternative

Impacts on electrical supply, water supply, natural gas supply, the sanitary sewer, and wastewater system at NAVSTA Norfolk from the renovation of buildings to meet updated mission needs would not be expected to be significant. Under the NAVSTA Norfolk Alternative, no water lines, sanitary sewer and wastewater lines, natural gas lines, or electrical transmission lines would be removed or replaced at NAVSTA Norfolk. All utility lines to the LTF, LSF, and MMRC, would remain intact. Existing slab and asphalt concrete would be repaired, as necessary. No new sidewalks would be installed at NAVSTA Norfolk.

The additional personnel would result in a slight increase in the demand for water and natural gas and the amount of wastewater generated. NAVSTA Norfolk currently has 3.7 million gallons of potable water storage capacity and uses an estimated 2.52 MGD. The increase of 3,600 personnel would equate to an approximate 5 percent increase in the installation's population. The Hampton Roads Sanitation District currently services roughly 1.6 million people, the additional 3,600 personnel would account for an estimated 0.2 percent increase. Overall, no significant impacts on water supply, natural gas supply, and the sanitary sewer and wastewater system would be expected under NAVSTA Norfolk Alternative.

Storm Water Drainage. The alternative would not alter existing storm water drainage methods or significantly increase the amount of impervious surfaces at the installation. No significant impacts on storm water drainage would be expected.

Liquid Fuel Supply. The NAVSTA Norfolk Alternative would result in additional demand for liquid fuels, since each LCS would be fueled prior to embarking on deployment. The liquid fuel capacity at NAVSTA Norfolk is 7,742,632 gallons. Since there would be no significant change in the number of total ships stationed at NAVSTA Norfolk, no significant impacts on liquid fuel supply would be expected.

Transportation. As previously discussed, there would be an increase of approximately 1,700 Navy personnel under the Proposed Action. For purposes of this analysis, a 1:1 ratio of cars to Navy personnel is assumed, which would equate to an increase of approximately 1,700 additional vehicles which would be travelling to and from the installation. The increase in personnel and subsequent increase in vehicles would be phased in over an 8-year period, as the LCSs are homeported between FY 2013 and FY 2020. The additional personnel and vehicles would result in an increase in trips along the major roadways within and adjoining NAVSTA Norfolk; however, not all of these vehicles would be driven to the installation at the same time. Major access roads such as Hampton Boulevard would carry the additional vehicles to and from the installation and could experience additional congestion. In addition, with varying work schedules, deployments, mass transit options, carpooling, and other traffic-calming initiatives at NAVSTA Norfolk, the additional vehicle trips would be intermittent, and a significant increase in traffic congestion would not be expected. The vehicles used by the family members of military personnel would be driven to NAVSTA Norfolk occasionally and would be expected to use varying roadways at various times. Therefore, no significant impacts would be expected.

Solid Waste Management. Increases in solid waste associated with the renovation activities would be minimal and temporary in nature, and would be disposed of in accordance with relevant Federal, state, and local regulations. Renovation materials would be recycled or reused to the maximum extent practicable. Renovation debris that could not be recycled or reused would be taken off-installation to an approved construction and demolition landfill within the vicinity of NAVSTA Norfolk. Therefore, no significant impacts on solid waste management would be expected at NAVSTA Norfolk.

As previously stated, the City of Norfolk Waste Management Division collects solid waste from approximately 61,000 residences and businesses. The addition of approximately 1,700 residences would

result in an increase of less than 3 percent. This would result in a negligible increase in the amount of solid waste generated. In port, solid waste and recyclables generated onboard the LCSs would be transferred onshore for offsite disposal and recycling. The slight increase in the amount of solid waste generated from the increase in personnel would not be expected to exceed the capacity of existing solid waste disposal facilities.

3.9.3.3 MCAS Cherry Point

Minor building renovations to existing facilities would occur at MCAS Cherry Point, however no modifications to existing utilities and services are proposed. As such, impacts on utilities, infrastructure, and transportation would not be significant. Therefore an analysis of utilities, infrastructure, and transportation impacts at MCAS Cherry Point has not been included.

3.9.3.4 No Action Alternative

Up to 14 LCSs would not be homeported at the proposed installations on the East Coast. The Navy's capability to perform mine countermeasures, anti-submarine warfare, or surface warfare in the littoral regions would not be further enhanced. The Navy's need to homeport the LCSs in a location with sufficient support facilities and infrastructure to ensure and enhance access-focused missions to littoral regions would not be met. No additional impacts, beyond what is currently being experienced, on infrastructure or transportation would be expected under the No Action Alternative.

3.10 Hazardous Materials and Wastes

3.10.1 Definitions

Hazardous Materials, Hazardous Wastes, and Petroleum Products. Hazardous materials are defined by 49 CFR § 171.8 as "hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (49 CFR § 172.101), and materials that meet the defining criteria for hazard classes and divisions" in 49 CFR § 173. Transportation of hazardous materials is regulated by the U.S. Department of Transportation regulations within 49 CFR § 105–180.

Hazardous wastes are defined by RCRA at 42 U.S.C. § 6903(5), as amended by the Hazardous and Solid Waste Amendments, as: "a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (A) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed." Certain types of hazardous wastes are subject to special management provisions intended to ease the management burden and facilitate the recycling of such materials. These are called universal wastes and their associated regulatory requirements are specified in 40 CFR § 273. Special hazards are those substances that might pose a risk to human health and are addressed separately from other hazardous substances.

Asbestos-Containing Materials. Asbestos is the generic term used to describe a group of naturally occurring silicate minerals that have the ability to separate into small, fine fibers. Asbestos has been used in building materials and is commonly found in older buildings. Asbestos exists in a variety of forms and can be found in floor tiles, floor tile mastic, roofing materials, joint compound, wallboard, thermal system insulation, and boiler gaskets. Asbestos is regulated by the USEPA. Section 112 of the CAA regulates

emissions of asbestos fibers to ambient air. ACMs at Navy facilities are managed in accordance with OPNAVINST 5100.23G, *Navy Safety and Occupational and Health Program Manual*.

Lead-Based Paint and Heavy Metals. Lead is a heavy, ductile metal commonly found simply as metallic lead or in association with organic compounds, oxides, and salts. It was commonly used in house paint prior to the 1970s. The Federal government banned the use of most LBP in 1978; therefore, all buildings constructed prior to 1978 are assumed to contain LBP. The Residential LBP Hazard Reduction Act of 1992, Subtitle B, Section 308 (commonly called Title X), passed by Congress on 28 October 1992, regulates the use and disposal of LBP on Federal facilities. RCRA also identifies seven other heavy metals as a hazardous waste and material: arsenic, barium, cadmium, chromium, mercury, selenium, and silver. Federal agencies are required to comply with applicable Federal, state, and local laws relating to LBP activities and hazards.

Polychlorinated Biphenyls. PCBs are man-made chemicals that persist in the environment and were widely used in construction materials and electrical products prior to 1978. Congress banned the manufacture and use of PCBs in 1976, and PCBs were phased out in 1978, except in certain limited uses. PCBs could be present in light ballasts; transformers; and caulk used in windows, door frames, masonry columns, and other masonry building materials in many schools and other buildings built or renovated between 1950 and 1978. The USEPA is concerned about the potential for school children and other building occupants to become exposed to PCBs, because PCBs can migrate from the caulk into air, dust, surrounding materials, and soil (USEPA 2011b).

Radon. Radon is a naturally occurring radioactive gas found in soils and rocks. Radon has the tendency to accumulate in enclosed spaces that are usually below ground and poorly ventilated (e.g., basements). Radon is an odorless, colorless gas that has been determined to increase the risk of developing lung cancer. In general, the risk increases as the level of radon and length of exposure increase.

Installation Restoration Program. The DOD established the IRP in 1975 to address hazardous waste sites on military property. The mission of the IRP is to identify, characterize, and clean up contamination on military installations resulting from formerly accepted use and disposal practices of hazardous waste to protect human health and the environment. Depending upon the circumstances, IRP Sites are identified, investigated, and cleaned up in accordance with RCRA, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), or with an integrated approach based on both laws (NAVFAC 2005).

3.10.2 Existing Conditions

3.10.2.1 NAVSTA Mayport Alternative

Scenario 1 – NAVSTA Mayport

Hazardous Materials and Hazardous Wastes. The Navy has implemented a Hazardous Material Control and Management Program and a Hazardous Waste Minimization Program for all of its facilities, including NAVSTA Mayport. These programs are governed by OPNAVINST 4110.2, *Hazardous Material Control and Management* and OPNAVINST 5090.1C, respectively. Hazardous wastes are also managed in accordance with Navy guidance in SOPA(ADMIN)MYPTINST5090.1SERIES, *Disposal of Hazardous Materials/Hazardous Wastes*, which is implemented by the NAVSTA Mayport Public Works Department, Environmental Division (Navy 2008). The Navy continuously monitors its operations to find ways to minimize the use of hazardous materials and to reduce the generation of hazardous wastes. The Navy has also developed a Hazardous Waste guide which aims to document procedures relevant to the utilization of hazardous materials, and minimization and management of hazardous waste (Navy

2012g). Nonhazardous materials are substituted for hazardous materials whenever practicable, processes are changed to ones that do not employ hazardous materials, and care is taken to avoid contaminating nonhazardous materials with hazardous materials.

Activities at NAVSTA Mayport require the installation to use, handle, and store hazardous materials, including oils, lubricants, cleaners, hydraulic fluids, and fuels (i.e., gasoline and diesel). Industrial activities also generate various quantities of hazardous wastes, such as oils, lubricants, hydraulic fluids, paint, paint thinners, cleaners, degreasers, solvents, and batteries. Wastes generated and managed at NAVSTA Mayport include waste oils, fuels, lubricants, solvents, paints, and general refuse associated with ship, aircraft, vehicle, and building maintenance activities. NAVSTA Mayport is classified as a large quantity generator (LQG) of hazardous waste. An LQG generates more than 2,200 pounds (1,000 kilograms [kg]) of hazardous waste, or more than 2.2 pounds (1 kg) of acutely hazardous waste, per month. Bulk quantities of fuels are managed in ASTs, USTs, pumps, pipelines, and oil-water separators (NAVFAC LANT 2008).

Asbestos-Containing Material. Since Buildings 261, 1263, 1393, and 1394 were built prior to 1980, they likely contain ACM. Buildings 1364 and 1437 are the tennis courts and are unlikely to contain ACM. All ACMs are characterized and handled in accordance with applicable Federal and state regulations; the Navy Safety and Occupational Health Program; the Navy Hazardous Materials Reutilization, Hazardous Waste Minimization and Disposal guide; and NAVSTA Mayport SOPs.

Lead-Based Paint and Heavy Metals. Building 261 at NAVSTA Mayport was constructed in 1961; therefore, it is likely that this facility contains LBP or other heavy metals, including arsenic, barium, cadmium, chromium, mercury, selenium, or silver from past uses. Buildings 1393 and 1394 at NAVSTA Mayport were constructed in 1978; therefore, they could contain LBP or heavy metals, however it is unlikely. Building 1263 was built before 1978; therefore it is likely that it contains LBP or heavy metals. Buildings 1364 and 1437 are tennis courts and are unlikely to contain LBP or heavy metals. All LBP and heavy metals are characterized and handled in accordance with applicable Federal and state regulations, the Navy Safety and Occupational Health Program, and NAVSTA Mayport SOPs.

Polychlorinated Biphenyls. Building 261 was built in 1961 and Buildings 1393 and 1394 in 1978. Therefore, Building 261 is likely to contain PCB-contaminated material. Since Buildings 1393 and 1394 were built in 1978, they could also contain PCB-contaminated material; however it is unlikely. Building 1263 was built in 1971; therefore it is likely that it contains PCB-contaminated material. Buildings 1364 and 1437 are the tennis courts and are unlikely to contain PCB-contaminated material. All PCB-contamination is characterized and handled in accordance with applicable Federal and state regulations; the Navy Safety and Occupational Health Program; the Navy Hazardous Materials Reutilization, Hazardous Waste Minimization and Disposal guide; and NAVSTA Mayport SOPs.

Radon. The USEPA has established a guidance radon level of 4 picoCuries per liter (pCi/L) in indoor air for residences. Radon gas accumulations greater than 4 pCi/L are considered to represent a health risk to occupants. Duval County, Florida, is in Radon Zone 3, which has a low potential for radon above 4 pCi/L. Radon Zone 3 has a predicted average indoor radon level of less than 2 pCi/L (USEPA undated a, USEPA undated b).

Installation Restoration Program. USEPA Region 4 conducted a RCRA Facility Assessment at NAVSTA Mayport in 1989. The RCRA Facility Assessment identified 56 solid waste management units and two areas of concern. Fifteen solid waste management units were determined to require No Further Action (Navy 2008). The proposed location of the MMRC is near SWMUs 1, 23, 24, and 25. Groundwater at these SWMU sites has been grouped together and assessed collectively during the initial 2007 RCRA Facility Assessment. No surface water exists at any of the SWMU sites. The contaminants

of concern in the groundwater at the SWMUs are the metals antimony, arsenic, silver, and zinc (NAVSTA Mayport 2007b).

Solid Waste Management Unit 1. SWMU 1 is the former Landfill A, near the Jacksonville Shipyard, Inc., and the Administrative Building along Bon Homme Richard Avenue. The landfill is reported to have covered a 4-acre area where a series of trenches were excavated, filled with waste materials, and covered with soil. The site has been impacted by arsenic and polycyclic aromatic hydrocarbon. SWMU 1 contains no contaminants of concern for subsurface soil. SWMU 1 is approximately 300 feet (95 meters) from the proposed MMRC site. Land use controls for surface soil were implemented to prevent residential development and to prevent uncontrolled surface soil disturbance (NAVSTA Mayport 2007b).

Solid Waste Management Unit 23. SWMU 23 is the location of the former Jacksonville Shipyards, Inc., that operated between 1961 and 1992, and was used to conduct maintenance and repair on Navy ships. It was a 4-acre property that included activities such as abrasive media blasting, fabrication of metal parts, metal working, degreasing, paint stripping, welding, and other ship support operations. The site has been impacted by arsenic (also in the subsurface soils), polycyclic aromatic hydrocarbon compounds, copper, lead, and nickel in the surface soil. The contaminants of concern in groundwater at SMWU 23 are the metals antimony, arsenic, silver, and zinc. This site is in the immediate area of the proposed MMRC. Land use controls have been implemented for surface soil and subsurface soil to prevent residential development and to prevent uncontrolled surface soil disturbance (NAVSTA Mayport 2007b).

Solid Waste Management Unit 24. SWMU 24 is the location of the North Florida Shipyards, Inc., that began operation in 1982. NAVSTA Mayport leases this 1.5-acre area to North Florida Shipyards, Inc., to conduct maintenance and repair on Navy ships. Activities at the shipyard area include abrasive media blasting, fabrication of metal parts, metal working, degreasing, paint stripping, and welding. SWMU 24 has been impacted by polycyclic aromatic hydrocarbon compounds in surface soil and arsenic in subsurface soil. SWMU 24 is approximately 400 feet (120 meters) from the proposed MMRC site. Land use controls were implemented for surface soil and subsurface soil to prevent the SWMU from being used for residential purposes and to prevent uncontrolled surface soil and subsurface soil disturbance (NAVSTA Mayport 2007b).

Solid Waste Management Unit 25. SWMU 25 is the Atlantic Marine, Inc., site, which has been in operation since 1980. This 1.5-acre area was leased to Atlantic Marine, Inc., to conduct the maintenance and repair of Navy ships, similar to the former Jacksonville Shipyards, Inc., and North Florida Shipyards, Inc. SWMU 25 has been impacted by aldrin in surface soil and dieldrin in subsurface soil. SWMU 25 is approximately 215 feet (65 meters) from the proposed MMRC site. Land use controls were implemented for surface soil and subsurface soil to prevent residential development, prevent uncontrolled surface soil and subsurface soil disturbance, and to ensure that no unauthorized disturbance to any asphalt- or concrete-covered areas (NAVSTA Mayport 2007b).

Scenario 2 – NAVSTA Mayport-NSB Kings Bay

Activities under the NSB Kings Bay Scenario that would occur at NAVSTA Mayport are discussed in the previous section.

Hazardous Materials and Hazardous Wastes. Activities at NSB Kings Bay require the installation to use, handle, and store hazardous materials, including oils, lubricants, cleaners, hydraulic fluids, and fuels (i.e., gasoline and diesel). Industrial activities also generate various quantities of hazardous wastes, such as oils, lubricants, hydraulic fluids, paint, paint thinners, cleaners, degreasers, solvents, and batteries. NSB Kings Bay is an LQG of hazardous wastes (USEPA 2009).

Asbestos-Containing Material. The building proposed for MMRC functions is likely to contain ACM if it was built before 1980. ACMs are characterized and handled in accordance with applicable Federal and state regulations, the Navy Safety and Occupational Health Program, the Navy Hazardous Materials Reutilization, Hazardous Waste Minimization and Disposal guide and NSB Kings Bay SOPs.

Lead-Based Paint and Heavy Metals. The building proposed for MMRC functions could contain LBP if it was built before 1978 or contain heavy metals from past use. LBP or heavy metals are characterized and handled in accordance with applicable Federal and state regulations, the Navy Safety and Occupational Health Program, and NSB Kings Bay SOPs.

Polychlorinated Biphenyls. The building proposed for MMRC functions could contain PCB-contaminated material if it was built before 1978. PCB-contaminated materials are characterized and handled in accordance with applicable Federal and state regulations, the Navy Safety and Occupational Health Program, the Navy Hazardous Materials Reutilization, Hazardous Waste Minimization and Disposal guide, and NSB Kings Bay SOPs.

Radon. The USEPA has established a guidance radon level of 4 pCi/L in indoor air for residences. Radon gas accumulations greater than 4 pCi/L are considered to represent a health risk to occupants. Camden County, Georgia, is in Radon Zone 3, which has a low potential for radon above 4 pCi/L. Radon Zone 3 has a predicted average indoor radon level of less than 2 pCi/L (USEPA undated a, USEPA undated b).

3.10.2.2 NAVSTA Norfolk Alternative

Hazardous Materials and Hazardous Wastes. NAVSTA Norfolk is classified as an LQG of hazardous waste. An LQG generates more than 2,200 pounds (1,000 kg) of hazardous waste, or more than 2.2 pounds (1 kg) of acutely hazardous waste, per month. In 1997, NAVSTA Norfolk was designated a National Priorities List site under CERCLA (NAVFAC LANT 2008). Hazardous wastes generated at NAVSTA Norfolk are accumulated in Satellite Accumulation Areas and Hazardous Waste Accumulation Areas and transferred to either Hazardous Waste Accumulation Areas located at Building LP-24 or placed into the LP-24 or LP-159 Storage Facilities. Operations on NAVSTA Norfolk require use of a variety of materials including petroleum, oil, and lubricant 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 (NAVFAC LANT 2008).

NAVSTA Norfolk requires new construction of buildings to house functions related to the LTF, LSF, MMRC, and MMRC Annex. Therefore, no issues with respect to ACM, LBP, and PCBs at NAVSTA Norfolk are expected.

Radon. The USEPA has established a guidance radon level of 4 pCi/L in indoor air for residences. Radon gas accumulations greater than 4 pCi/L are considered to represent a health risk to occupants. Norfolk City, Virginia, is in Radon Zone 3, which has a low potential for radon above 4 pCi/L. Radon Zone 3 has a predicted average indoor radon level of less than 2 pCi/L (USEPA undated a, USEPA undated b).

Installation Restoration Program. In 2010, NAVFAC developed a site management plan for IRP and SWMU sites at NAVSTA Norfolk (NAVFAC 2010). The plan identified 23 IRP and 42 SWMU sites at NAVSTA Norfolk. These sites include a variety of sources of potential contaminants including landfills, a drum storage yard, PCB transformer storage and work areas, slag piles, pesticide shop disposal areas,

aircraft maintenance, and a salvage yard. There are no IRP or SWMU sites within the area of proposed construction at NAVSTA Norfolk.

3.10.2.3 MCAS Cherry Point

Activities at MCAS Cherry Point require the installation to use, handle, and store hazardous materials, including oils, lubricants, cleaners, hydraulic fluids, and fuels (i.e., gasoline and diesel). Industrial activities also generate various quantities of hazardous wastes, such as oils, lubricants, hydraulic fluids, paint, paint thinners, cleaners, degreasers, solvents, and batteries. Wastes generated and managed at MCAS Cherry Point include waste oils, fuels, lubricants, solvents, paints, and general refuse associated with aircraft, vehicle, and building maintenance activities. Large volumes of hazardous materials are stored in discrete locations such as fuel storage areas, vehicle maintenance areas, and pesticide storage areas.

Only minor renovation activities would occur under the Proposed Action at MCAS Cherry Point. Therefore, no issues with respect to ACM, LBP, and PCBs at MCAS Cherry Point are expected.

Radon. The USEPA has established a guidance radon level of 4 pCi/L in indoor air for residences. Radon gas accumulations greater than 4 pCi/L are considered to represent a health risk to occupants. Craven County, North Carolina, is in Radon Zone 3, which has a low potential for radon above 4 pCi/L. Radon Zone 3 has a predicted average indoor radon level of less than 2 pCi/L (USEPA undated a, USEPA undated b).

Installation Restoration Program. Since Firescout operations would use existing infrastructure and structures, it is not anticipated that there would be any impacts on the IRP program at MCAS Cherry Point.

3.10.3 Environmental Consequences

3.10.3.1 NAVSTA Mayport Alternative

Scenario 1 – NAVSTA Mayport

Hazardous Materials, Hazardous Wastes, and Petroleum Products. Construction and demolition activities would require the use of certain hazardous materials (e.g., paints, welding gases, solvents, preservatives, sealants). It is anticipated that during renovation activities, use of products containing hazardous materials would be short in duration. Renovation activities would be short-term in nature and would not be expected to generate more waste than the amount allowable by NAVSTA Mayport's LQG classification. An LQG generates more than 2,200 pounds of hazardous waste, or more than 2.2 pounds of acutely hazardous waste, per month. The quantity of hazardous wastes generated from renovation activities would be minor and would not be expected to exceed the capacities of on-installation storage or existing hazardous waste disposal facilities. Renovation activities at NAVSTA Mayport would be similar to, and consistent with, other installation improvement actions. The installation, along with the Navy, has established measures and programs for the management of construction activities to ensure they are conducted in compliance with Federal, state, and local environmental laws and regulations. Therefore, no significant impacts would be expected.

The homeporting of up to 14 LCSs would require additional volumes of hazardous materials to be delivered to the LCSs for use while the ships are in port and on deployment. NAVSTA Mayport would also receive additional volumes of hazardous wastes, which would be generated aboard the LCSs while the ships were on deployment and in port. It is anticipated that by 2020 there would be one additional

vessel and a few more personnel at NAVSTA Mayport than at 2010 levels (CNO 2012, Brumley 2012). Therefore, the additional hazardous wastes generated under the Proposed Action are not expected to be significant. Hazardous waste generated from the ships would not be expected to exceed the capacities of on-installation storage facilities or the current classification of NAVSTA Mayport's LQG-status.

Asbestos-Containing Material. Buildings 261 and 1263 were constructed in 1961 and 1971, respectively. They are likely to contain ACM, and, therefore, in accordance with Navy policies and procedures, Building 261 and 1263 would need to be surveyed by a state-certified inspector prior to commencement of demolition activities. Buildings 1393 and 1394 were built in 1978 and might contain ACM; therefore, these buildings would need to be surveyed by a state-certified inspector. In accordance with Navy policies and procedures, demolition plans would be reviewed by NAVSTA Mayport civil engineering personnel to ensure appropriate measures were taken to reduce potential exposure to, and release of, asbestos. ACM discovered would be characterized and removed by state-certified individuals prior to renovation and disposed of at a USEPA-approved landfill. Contractors would be required to adhere to all Federal, state, and local regulations in addition to NAVSTA Mayport and Navy management plans. The removal of ACM during demolition activities would be conducted in accordance with Navy BMPs and would be similar to, and consistent with, other installation improvement actions. The installation has established measures and programs for the management of ACM to ensure it is handled and disposed of in compliance with Federal, state, and local environmental laws and regulations. Therefore, no significant impacts would be expected from the removal of ACM during demolition activities in Buildings 261 and 1263.

Lead-Based Paint and Heavy Metals. Since Building 261 was constructed in 1961 and Building 1263 was constructed in 1971 at NAVSTA Mayport, they are likely to contain LBP and heavy metals from past use. Therefore, in accordance with Navy policies and procedures, Building 261 and 1263 would need to be surveyed by a state-certified inspector prior to commencement of renovation activities. Buildings 1393 and 1394 were built in 1978 and would need to be surveyed by a state-certified inspector prior to commencement of renovation activities. In accordance with Navy policies and procedures, demolition plans would be reviewed by NAVSTA Mayport civil engineering personnel to ensure appropriate measures were taken to reduce potential exposure to LBP or heavy metals. LBP or heavy metals discovered would be characterized and removed by state-certified individuals prior to renovation, and disposed of at the NAVSTA Mayport Hazardous Waste Storage Facility. Contractors would be required to adhere to Federal and state regulations in addition to NAVSTA Mayport and Navy management plans. The removal of LBP or heavy metals during demolition activities would be conducted in accordance with Navy BMPs and would be similar to, and consistent with, other installation improvement actions. The installation has established measures and programs for the management of LBP to ensure it is handled and disposed of in compliance with Federal and state environmental laws and regulations. Therefore, no significant impacts would be expected from the removal of LBP or heavy metals during demolition activities in Buildings 261 and 1263.

Polychlorinated Biphenyls. Since Building 261 was constructed in 1961 and Building 1263 was constructed in 1971 at NAVSTA Mayport, they are likely to contain PCB-containing materials including caulk. Therefore, in accordance with Navy policies and procedures, Building 261 and 1263 would need to be surveyed by a state-certified inspector prior to commencement of renovation activities. Buildings 1393 and 1394 were built in 1978 and could contain PCB-containing ballasts in light fixtures along with various other portions of the buildings. Buildings 1364 and 1437 are tennis courts and are unlikely to contain PCBs. In accordance with Navy policies and procedures, demolition plans would be reviewed by NAVSTA Mayport civil engineering personnel to ensure appropriate measures were taken to reduce potential exposure to PCB-containing materials. PCB-containing materials discovered would be characterized and removed by state-certified individuals prior to renovation and disposed of at a USEPA-approved landfill. Contractors would be required to adhere to Federal and state regulations in

addition to NAVSTA Mayport and Navy management plans. The removal of PCB-containing materials during demolition activities would be conducted in accordance with Navy BMPs and would be similar to, and consistent with, other installation improvement actions. The installation has established measures and programs for the management of PCBs to ensure they are handled and disposed of in compliance with Federal and state environmental laws and regulations. Therefore, no significant impacts would be expected from the removal of PCB-contaminated material during demolition activities in Buildings 261 and 1263.

Radon. According to the USEPA-established guidance for indoor radon levels, radon gas accumulations greater than 4 pCi/L are considered to represent a health risk to occupants. Duval County, Florida, is in Radon Zone 3, which has a predicted average indoor radon level of less than 2 pCi/L (USEPA undated a, USEPA undated b). Though individual buildings in Zone 3 could have elevated levels of radon, currently, there is no evidence that radon levels have been exceeded in Buildings 261, 1263, 1393, and 1394. No significant impacts would be expected from radon.

Installation Restoration Program. Impacts from the Proposed Action at NAVSTA Mayport could be expected; however, these impacts would not be considered significant. The proposed site for the MMRC is within SMWU 23 and near SWMU 01, 25, and 24 (see **Figure 3-4**). Construction and renovation activities at NAVSTA Mayport would be similar to, and consistent with, other installation improvement actions. The installation has established measures and programs for the management of construction and renovation activities to ensure they are conducted in compliance with Federal, state, and local environmental laws and regulations. Due to the proximity of the existing SWMUs, there is potential to encounter contaminated surface soil, subsurface soil, and groundwater. If encountered, the handling, storage, transportation, and disposal of hazardous substances would be conducted in accordance with applicable Federal, state, and local regulations; Navy regulations; and NAVSTA Mayport procedures. Land use controls as described in **Section 3.10.2.1**, are in effect at the SWMU sites and would apply to proposed MMRC construction activities.

Scenario 2 – NAVSTA Mayport-NSB Kings Bay

Impacts related to hazardous materials, wastes, and petroleum products and to ACM in the facilities proposed for construction at NAVSTA Mayport are described in the previous section.

In accordance with Navy policies and procedures, the MMRC proposed at NSB Kings Bay would require a survey for ACM by a state-certified inspector prior to commencement of renovation activities if they were built before 1980. Renovation plans would be reviewed by civil engineering personnel to ensure appropriate measures were taken to reduce potential exposure to, and release of, asbestos. ACM discovered would be characterized and removed by state-certified individuals prior to renovation and disposed of at a USEPA-approved landfill. Contractors would be required to adhere to Federal and state regulations in addition to NSB Kings Bay and Navy management plans. The removal of ACM during renovation activities would be conducted in accordance with Navy BMPs and would be similar to, and consistent with, other installation improvement actions. The installation has established measures and programs for the management of ACM to ensure is is handled and disposed of in compliance with Federal and state environmental laws and regulations. Therefore, no significant impacts would be expected from the removal of ACM if renovation activities were proposed at NSB Kings Bay.

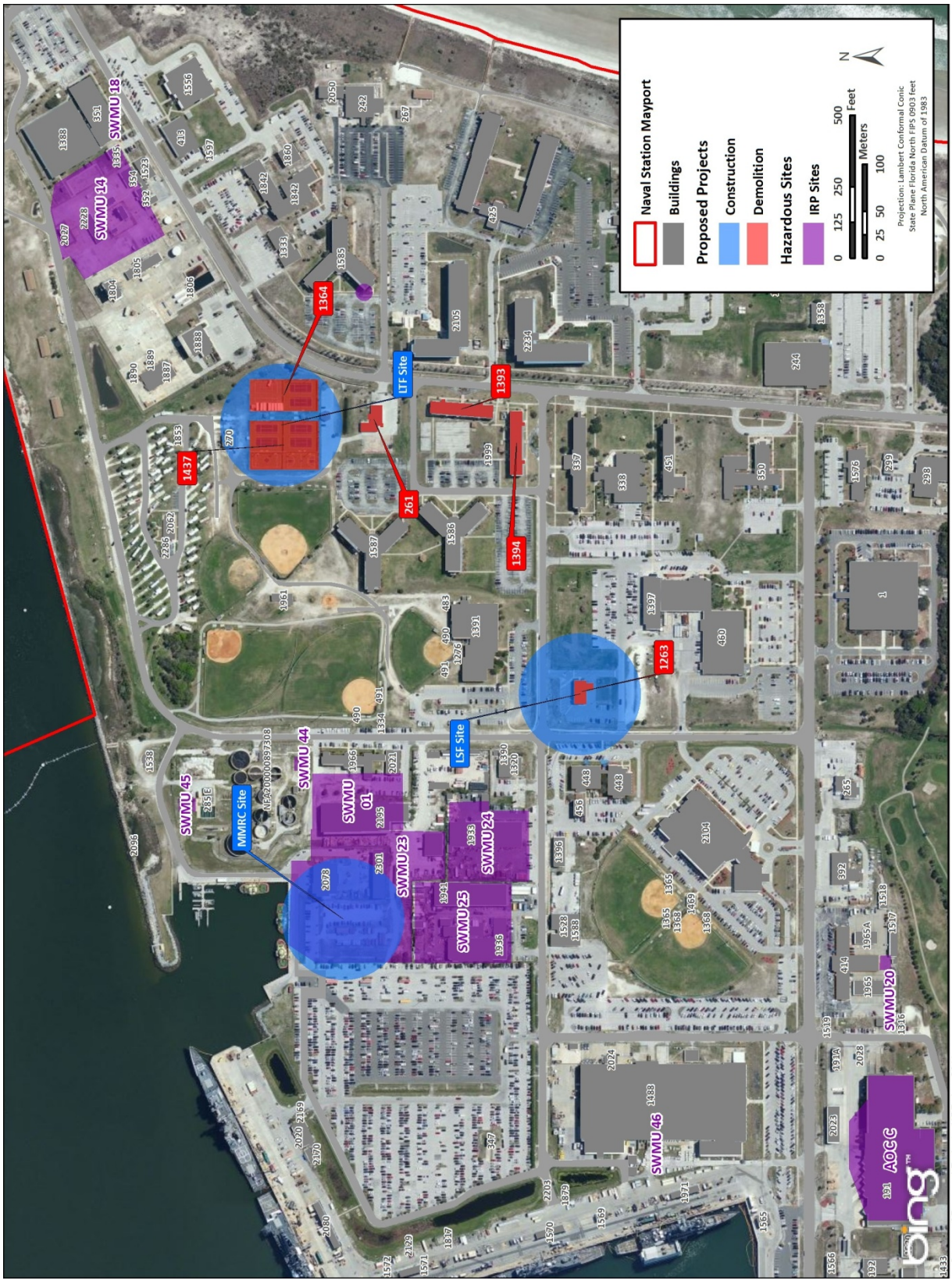

Figure 3-4. Locations of IRP Sites at NAVSTA Mayport

Lead-Based Paint and Heavy Metals. Impacts related to LBP and heavy metals would be similar to those mentioned under the NAVSTA Mayport Scenario. In accordance with Navy policies and procedures, Building 1065, Building 5087, and the building proposed for MMRC functions at NSB Kings Bay would require survey for LBP and heavy metals by a state-certified inspector prior to commencement of renovation activities if they were built pre-1978. Renovation plans would be reviewed by NSB Kings Bay civil engineering personnel to ensure appropriate measures were taken to reduce potential exposure to LBP or heavy metals. LBP or heavy metal materials discovered would be characterized and removed by state-certified individuals prior to renovation and disposed of at a USEPA-approved landfill. Contractors would be required to adhere to Federal and state regulations in addition to NSB Kings Bay and Navy management plans. The removal of LBP and heavy metals during renovation activities would be conducted in accordance with Navy BMPs and would be similar to, and consistent with, other installation improvement actions. The installation has established measures and programs for the management of LBP to ensure it is handled and disposed of in compliance with Federal and state environmental laws and regulations. Therefore, no significant impacts would be expected from the removal of LBP or heavy metals during demolition activities in Buildings 1065, Building 5087, and the building proposed for MMRC functions.

Polychlorinated Biphenyls. No significant impacts would be expected from the removal of PCBs at NSB Kings Bay. Impacts related to PCBs would be similar to those mentioned under the NAVSTA Mayport Scenario for the placement of the facilities at NAVSTA Mayport.

Radon. According to the USEPA-established guidance for indoor radon levels, radon gas accumulations greater than 4 pCi/L are considered to represent a health risk to occupants. Camden County, Georgia, is in Radon Zone 3, which has a predicted average indoor radon level of less than 2 pCi/L (USEPA undated a, USEPA undated b). Though individual buildings in Zone 3 could have elevated levels of radon, currently, there is no evidence that radon levels have been exceeded in Buildings 1065 and 5087. Therefore no significant impacts would be expected from radon.

3.10.3.2 NAVSTA Norfolk Alternative

Hazardous Materials, Hazardous Wastes, and Petroleum Products. Construction activities would require the use of certain hazardous materials (e.g., paints, welding gases, solvents, preservatives, sealants). It is anticipated that the quantity of products containing hazardous materials used during construction activities would be minimal and their use would be of short duration. The quantity of hazardous wastes generated from renovation activities would be minor and would not be expected to exceed the capacities of existing hazardous waste disposal facilities. Construction activities at NAVSTA Norfolk would be similar to, and consistent with, other installation improvement actions. The installation, along with the Navy, has established measures and programs for the management of construction activities to ensure they are conducted in compliance with Federal and state environmental laws and regulations. Therefore, no significant impacts would be expected.

The homeporting of up to 14 LCSs would require additional volumes of hazardous materials to be delivered to the LCSs for use while the ships are in port and on deployment. NAVSTA Norfolk would also receive additional volumes of hazardous wastes, which would be generated aboard the LCSs while the ships were on deployment and in port. It is anticipated that by 2020 there would be eight fewer ships at NAVSTA Norfolk than under 2010 levels (CNO 2012, Brumley 2012). Therefore, hazardous waste generated from the ships would not be expected to exceed the capacities of on-installation storage facilities or the current classification of NAVSTA Norfolk's LQG-status. Impacts related to hazardous materials, wastes, and petroleum products are not expected to be significant.

Since the NAVSTA Norfolk alternative requires completely new construction and no demolition, no impacts from ACM, LBP, and PCBs would be expected.

Radon. According to the USEPA-established guidance for indoor radon levels, radon gas accumulations greater than 4 pCi/L are considered to represent a health risk to occupants. Norfolk, Virginia, is in Radon Zone 3, which has a predicted average indoor radon level of less than 2 pCi/L (USEPA undated a, USEPA undated b). Though individual buildings in Zone 3 could have elevated levels of radon, currently, there is no evidence that radon levels have been exceeded in buildings on the NAVSTA Norfolk installation. Therefore, no significant impacts would be expected.

Installation Restoration Program. No impacts would be expected on the IRP program as a result of the Norfolk Alternative. There are no IRP or SWMU sites in the area that is proposed for LCS facilities (see **Figure 3-5**).

3.10.3.3 MCAS Cherry Point

The operation of the Firescout at MCAS Cherry Point could require the use of hazardous materials. However, hazardous waste generation would not be expected to be significant because the total increase in aircraft would not be expected to exceed current capacities. Minor building renovations to existing facilities would occur at MCAS Cherry Point, however no modifications to existing utilities and services are proposed, impacts on hazardous wastes and materials would not be significant.

Since only minor renovations would occur at MCAS Cherry Point, no impacts from ACM, LBP, and PCBs would be expected.

Radon. According to the USEPA-established guidance for indoor radon levels, radon gas accumulations greater than 4 pCi/L are considered to represent a health risk to occupants. Craven County, North Carolina, is in Radon Zone 3, which has a predicted average indoor radon level of less than 2 pCi/L (USEPA undated a, USEPA undated b). Though individual buildings in Zone 3 could have elevated levels of radon, currently, there is no evidence that radon levels have been exceeded in buildings on the MCAS Cherry Point installation. Therefore, no significant impacts would be expected.

Installation Restoration Program. Since there would be no anticipated changes to operations on MCAS Cherry Point, there would be no significant impacts on the IRP program.

3.10.3.4 No Action Alternative

Up to 14 LCSs would not be homeported at the proposed installations on the East Coast. The Navy's capability to perform mine countermeasures, anti-submarine warfare, or surface warfare in the littoral regions would not be further enhanced. The Navy's need to homeport the LCS in a location with sufficient support facilities and infrastructure to ensure and enhance access-focused missions to littoral regions would not be met. No additional impacts, beyond what is currently being experienced, on hazardous material and waste management would be expected under the No Action Alternative.

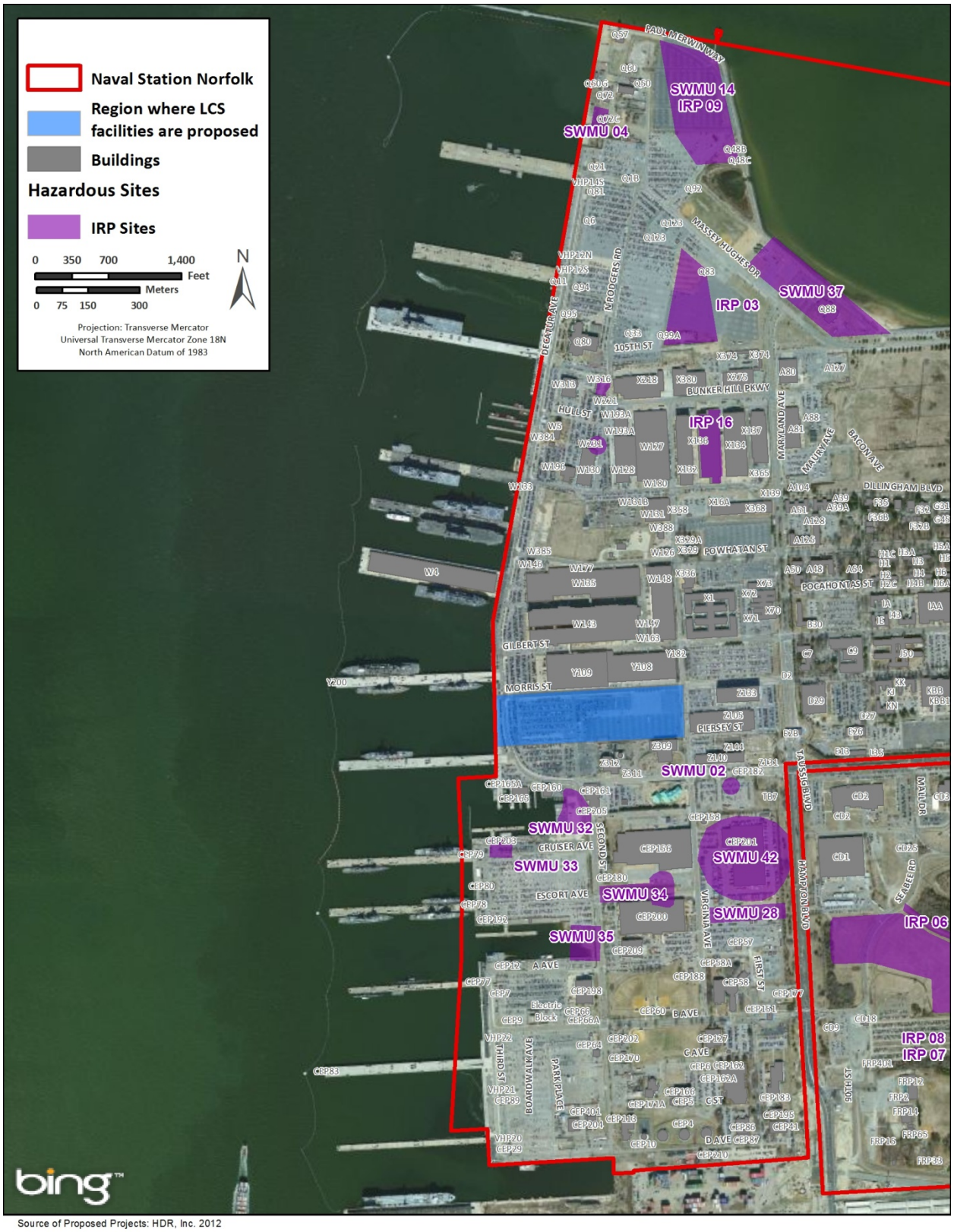

Figure 3-5. Locations of IRP Sites at NAVSTA Norfolk

3.11 Cultural Resources

3.11.1 Definition of the Resource

"Cultural resources" is an umbrella term for many heritage-related resources, including prehistoric and historic sites, buildings, structures, districts, objects, or any other physical evidence of human activity considered important to a culture, a subculture or a community. Cultural resources are protected by several Federal laws and regulations, including the National Historic Preservation Act (NHPA) (1966), the American Indian Religious Freedom Act (1978), the Archaeological Resources Protection Act (1979), and the Native American Graves Protection and Repatriation Act (1990). Cultural resources are commonly subdivided into archaeological resources (prehistoric or historic sites where human activity has left physical evidence of that activity but no structures remain standing), architectural resources (buildings or other structures or groups of structures that are of historic architectural, or other significance), and traditional cultural resources (for example, traditional gathering areas).

The NHPA defines "historic properties" as resources listed or eligible for listing in the NRHP. The NRHP is the official listing of properties significant in U.S. history, architecture, or prehistory, and includes both publicly and privately owned properties. The NRHP list is administered by the National Park Service. Historic properties might be buildings, structures, prehistoric or historic archaeological sites, districts, or objects that are generally 50 years of age or older, are historically significant, and that retain integrity that conveys this significance. More recent resources, such as Cold War-era buildings or structures, might warrant listing if they have the potential to gain significance in the future or if they meet "exceptional" significance criteria. Buildings are defined as a structure created to shelter any form of human activity and include houses, churches, barns, and other similar construction, while a structure is a functional construction that is made for purposes other than creating human shelter, such as a pier or a bridge.

Section 106 of the NHPA requires agencies, in consultation with the appropriate State Historic Preservation Officer (or Tribal Historic Preservation Officer), to take into account the effect of their undertakings on historic properties that are within the proposed project's Area of Potential Effect, which is defined as the geographic area(s) "within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist." Federally recognized Native American tribes are consulted in accordance with EO 13175, *Consultation and Coordination With Indian Tribal Governments* (9 November 2000) to develop ongoing relationships with the tribes on a government-to-government basis. Project-specific consultation with federally recognized Indian tribes is carried out pursuant to Section 106 of the NHPA, NEPA, and other authorities. The federally recognized Catawba Indian Nation has previously expressed interest in projects occurring in the Hampton Roads area and has participated in consultation with NAVSTA Norfolk. NAVSTA Mayport has consulted with the Seminole Tribe of Florida on previous projects. No federally recognized tribes have interests at MCAS Cherry Point or NSB Kings Bay.

3.11.2 Existing Conditions

3.11.2.1 NAVSTA Mayport

Scenario 1 – NAVSTA Mayport

A search of the Florida Master Site File indicates that ten cultural resource surveys of archaeological and architectural resources have been conducted at NAVSTA Mayport. These investigations have resulted in

the identification of five historic properties, which are architectural and archaeological resources that are listed in or eligible for listing in the NRHP (NAVFAC 2001, Navy 2008).

The remaining buildings at NAVSTA Mayport, including those proposed for demolition (Buildings 261, 1263, 1393, and 1394) have been determined not eligible for listing in the NRHP. Currently, no resources of traditional, religious, or cultural significance to Native American tribes have been identified within NAVSTA Mayport.

Scenario 2 – NAVSTA Mayport-NSB Kings Bay

The location of NSB Kings Bay near the St. Marys River on Cumberland Sound had a prehistoric and historic occupation similar to the location of NAVSTA Mayport. The protected location of the site proved important to the military and in 1954, the Federal government began acquiring land for a shipping terminal at Kings Bay. The military shipping terminal, with railroad access, was completed in 1958. In 1978, the Navy established Naval Submarine Support Base Kings Bay and in 1982, the installation became NSB Kings Bay.

A search of the Georgia Site File indicates that 30 cultural resource surveys have been conducted at NSB Kings Bay. There are no NRHP-listed resources at NSB Kings Bay and, as of 2006, there were no NRHP-eligible buildings. There are numerous archaeological sites on the installation, but the location of these sites is not available to the public, and because there would be no ground disturbance associated with this project, that information is not required. Currently, no resources of traditional, religious, or cultural significance to Native American tribes have been identified within NAVSTA Mayport.

3.11.2.2 NAVSTA Norfolk

NAVSTA Norfolk is located at the entrance to the James River, an area that has been important to settlement, navigation, and defense since the founding of the Jamestown settlement in 1607. Immediately after the Jamestown exposition in 1907, the site was under consideration for a naval base, and in 1917 the Federal government purchased the acreage to develop the installation. The adjacent Elizabeth River was dredged for ship traffic and the resultant fill added to the shore. In 1918, it became Naval Air Station Hampton Roads and in 1953 it became known as NAVSTA Norfolk.

The installation's Integrated Cultural Resources Management Plan (ICRMP) was consulted and a site search of NAVSTA Norfolk was conducted through the Data Sharing System of the Virginia Department of Historic Resources to identify historic properties in the area surrounding the proposed construction of LCS facilities. These efforts identified one historic district located within the vicinity of the proposed project area, the NRHP-eligible Naval Supply Depot Historic District, which is composed of four contributing resources (Sadler et. al 2012). All of these historic resources are protected under a 1999 Programmatic Agreement (revised 2010) between the Department of the Navy, the Advisory Council on Historic Preservation, and the Virginia State Historic Preservation Office (SHPO) (CNRMA 1999). The Naval Supply Depot Historic District consists of four contributing resources: Building W-143, Pier 4 (now renamed Pier 8), Building W-4, and W-306 (bulkhead). NAVSTA Norfolk has no NRHP-listed or eligible archaeological sites within the proposed project area. The nearest NRHP-eligible archaeological site (44NR0027) is located more than 1.8 miles to the east of the Proposed Action (Markell and Grandine 2002). Currently, no resources of traditional, religious, or cultural significance to Native American tribes have been identified within NAVSTA Norfolk.

3.11.2.3 MCAS Cherry Point

MCAS Cherry Point is located on the Neuse River near Pamlico Sound. The Federal government purchased land and began construction of MCAS Cherry Point in 1941 as part of the preparedness effort for World War II.

MCAS Cherry Point follows the installation's Integrated Cultural Resources Management Plan to manage both prehistoric and historic cultural resources (MCAS Cherry Point 2009b). MCAS Cherry Point has only one NRHP-eligible architectural resource (i.e., the Officer Housing Historic District, which includes Buildings 300–349, 486, 492–497) and it is not anticipated to be affected by the Proposed Action (DoN 2004). The most recent architectural survey of MCAS Cherry Point was in 1998. Therefore, any buildings constructed during or after 1948 and before 1963 would need to be re-evaluated for significance based on NRHP criteria prior to any renovations.

In consultation with the North Carolina SHPO, MCAS Cherry Point has identified all areas within the installation boundary that contain high probability of archaeologically sensitive soils. A total of 94 archaeological sites, dating from the prehistoric Middle Archaic Period to the mid-20th century, have been identified at MCAS Cherry Point and its outlying landing fields (MCAS Cherry Point 2008). Five archaeological sites have been determined eligible for listing in the NRHP and 17 require further evaluation to determine eligibility. Currently, no resources of traditional, religious, or cultural significance to Native American tribes have been identified within MCAS Cherry Point.

3.11.3 Environmental Consequences

Impacts on cultural resources include potential effects on historic properties, cultural items as defined in the Native American Graves Protection and Repatriation Act, archaeological resources as defined by the Archaeological Resources Protection Act of 1979, and archaeological artifact collections and associated records as defined by 36 CFR §79.

Potential impacts on historic properties are categorized by criteria established by Section 106 of the NHPA (36 CFR §800) and its implementing regulations. These include the following:

- "No Historic Properties Affected" is defined as no historic properties present or that there are historic properties present but the undertaking would have no effect upon them as defined in 36 CFR §800.16(i).
- "No Adverse Effect" is defined as when the undertaking's effects do not meet the criteria of 36 CFR § 800.5(a)(1) "Adverse Effect" or the undertaking is modified or conditions are imposed to avoid adverse effects. A proposed action results in a "No Adverse Effect" determination when the impacts on a historic property are minimal but do not completely alter the historic characteristics that qualify it for eligibility in the NRHP.
- "Adverse Effect" is defined as when the undertaking could alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that could have been identified subsequent to the original evaluation of the property's eligibility for the National Register (36 CFR §800.5(a)).

Inadvertent Discovery. The potential exists for the inadvertent discovery of cultural resources during ground-disturbing activities related to the proposed construction and demolition at the naval facilities

listed. In the event of inadvertent discovery of cultural resources or human remains, procedures outlined in each facility's respective *Integrated Cultural Resources Management Plan* would be followed.

3.11.3.1 NAVSTA Mayport Alternative

Scenario 1 – NAVSTA Mayport

All five historic properties at NAVSTA Mayport are located more than 0.5 miles from the proposed construction/demolition areas. In addition, it is unlikely that ground disturbance related to construction and demolition would have an effect on unknown historic properties due to the heavy disturbance already noted at the entire naval station. An overview survey by the USACE in 1989 concluded that most of the NAVSTA Mayport installation has been too disturbed or is too recent of a land surface to warrant further archaeological consideration (Navy 2008). The Navy initiated consultation with the Florida SHPO and received concurrence on 23 May 2013 (see **Appendix A**). The Florida SHPO concurs with the Navy's determination that the proposed undertakings will have no effect on historic properties and the buildings do not appear to meet the criteria for listing on the NRHP. Construction and demolition activities associated with the Proposed Action would occur in previously disturbed areas; therefore no impacts on archaeological sites would be expected.

Scenario 2 – NAVSTA Mayport-NSB Kings Bay

Impacts at NAVSTA Mayport would be the same as described under the NAVSTA Mayport Scenario. No buildings would be demolished at NSB Kings Bay. No construction or other ground-disturbing activity would occur at NSB Kings Bay.

The proposed modification of an existing facility at NSB Kings Bay for use as the MMRC is unlikely to affect historic properties because there are no known NRHP-listed or -eligible historic structures on the installation and most buildings were constructed after 1962. The Proposed Action includes the renovation of the interior of Building 5087, which is not currently listed or eligible for listing in the NRHP. Because no ground-disturbing activities are planned for this Proposed Action at NSB Kings Bay, it has no potential to affect archaeological resources. Therefore, a "No Historic Properties Affected" determination on NRHP-eligible resources would be expected, and no significant impacts on cultural resources would be expected from implementation of the NSB Kings Bay Alternative.

3.11.3.2 NAVSTA Norfolk Alternative

Implementation of the Proposed Action at NAVSTA Norfolk could have an impact on cultural resources that have been determined eligible for listing on the NRHP, but that impact is not expected to be significant. No demolition of existing buildings is proposed at NAVSTA Norfolk. The proposed construction, west of Building Z105 and north of Building Z309, would occur south and east of the boundaries of the Naval Supply Depot Historic District, which was determined eligible for listing in the NRHP. Under the 1999 Programmatic Agreement, the Naval Supply Depot Historic District was classified as Historic Preservation Priority Category 2. This classification indicates the district lacked "the high standard of integrity or significance of Category," but that it should be preserved "if doing so does not seriously impede an installation's or activity's mission or have associated costs that substantially exceed the contemporary value of the properties" (CNRMA 1999). Since the execution of the Programmatic Agreement, several contributing buildings and structures have been demolished and the boundaries of the district have been redefined, leaving four contributing resources in the district.

The 1999 Programmatic Agreement stipulates that new construction within or adjacent to Category 2 historic districts "will be designed to fully consider a district's significant characteristics, including

location, design, setting, and feeling, along with the guidance on scale, massing, setback and related critical design elements detailed for each district" (CNRMA 1999). Consultation with the Virginia SHPO during the design phase of new construction in the Naval Supply Depot Historic District is required by the 1999 Programmatic Agreement (CNRMA 1999) to minimize or eliminate any adverse effects on historic properties. The Proposed Action is not expected to have any direct effects on the Naval Supply Depot Historic District; however, indirect visual effects may result from new construction associated with the Proposed Action. Consultation with the Virginia SHPO would ensure that new facilities are compatible with the historic character and setting of the Naval Suppy Depot Historic District. In the event that the Virginia SHPO determines the Proposed Action would have an adverse effect on the Naval Supply Depot Historic District, mitigation could include avoidance of the historic district, Historic American Buildings Survey (HABS)/Historic American Engineering Record (HAER) documentation, or other alternative mitigation measures.

In addition, the 1999 Programmatic Agreement stipulates that "ground disturbing activities associated with demolition, rehabilitation, renovation, and new construction, except those undertakings identified as having no adverse effect on historic properties, shall be coordinated with the Virginia Department of Historic Resources pursuant to 36 CFR 800.4 through 36 CFR 800.6" (CNRMA 1999). The Programmatic Agreement lists standard maintenance, renovation, and repairs or buildings and piers as exempt from SHPO coordination. The new construction of buildings under the Proposed Action would require coordination with the SHPO prior to construction activities at NAVSTA Norfolk. The installation will also consult with the Catawba Indian nation and other appropriate federally recognized tribes to ensure the Proposed Action will not have any effect on resources of traditional, religious, or cultural significance to the tribes. Treatment could include Phase I archaeological testing prior to ground disturbance. Although coordination with the SHPO is required before ground-disturbing activities, it is unlikely that intact archaeological deposits exist at the site of proposed construction at NAVSTA Norfolk because of previous disturbance. Therefore, construction of the buildings under the Proposed Action could have an effect on historic properties at NAVSTA Norfolk, but that effect is not expected to be adverse. The implementation of the Proposed Action at NAVSTA Norfolk could have an impact on cultural resources that have been determined eligible for listing in the NRHP, but that impact is not expected to be significant. The new construction could alter the current views of Buildings W-4 and W-143, but those buildings are not considered unusual or individually important and the viewshed has already been compromised by the construction of additional warehouses (Y-109 and Y-106) immediately to the south of Building W-143. Therefore, the project may have an impact on the NRHP-eligible historic district, but that impact is not expected to be significant.

3.11.3.3 MCAS Cherry Point

The Firescout program would require minor modifications to existing facilities at MCAS Cherry Point. If the building renovations associated with the Proposed Action occurred in the buildings within the Officer Housing Historic District (i.e., Buildings 300–349, 486, 492–497), coordination with the North Carolina SHPO would be necessary. If the proposed renovations were found to have an adverse impact on the historic district, mitigation could include avoidance, HABS/HAER documentation, or alternative mitigation methods. If the buildings to be renovated turned 50 years old since the last architectural survey at MCAS Cherry Point in 1998 (MCAS Cherry Point 2008), a revaluation for potential significance according to National Register Criteria would be needed. There are approximately 550 buildings in this category, most of which are residential. If the buildings proposed for renovation under the Proposed Action were constructed after 1948 and before 1963, their significance would also need to be re-evaluated. This assessment should occur in consultation with the North Carolina SHPO. If any properties are determined eligible for listing in the NRHP, and it is determined that the Proposed Action would have an adverse effect on these properties, possible mitigation could include avoidance, HABS/HAER documentation, or alternative mitigation measures.

3.11.3.4 No Action Alternative

Under the No Action Alternative, no upgrades would take place at any of the naval facilities. Baseline conditions for cultural resources would therefore remain unchanged and a "No Historic Properties Affected" determination on NRHP-eligible resources would be expected. No significant impacts on cultural resources would be expected under the No Action Alternative.

3.12 Mitigation

No significant impacts as a result the Proposed Action would be expected. Therefore, no mitigation measures would be required.

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4. Cumulative and Other Impacts

4.1 Cumulative Effects

Federal regulations implementing NEPA (CEQ 40 CFR § 1500–1508) and Navy procedures for implementing NEPA (32 CFR § 775), as described in OPNAVINST 5090.1C, require that the cumulative effects of a proposed action be assessed. CEQ regulations implementing the procedural provisions of NEPA define cumulative effects as follows (40 CFR § 1508.7):

> The impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions.

A cumulative effect could be additive (i.e., the net adverse cumulative effects are strengthened by the sum of individual effects), countervailing (i.e., the net adverse cumulative effect is less as a result of the interaction between beneficial and adverse individual effects), or synergistic (i.e., the net adverse cumulative effect is greater than the sum of the individual effects). Cumulative effects could result from individually minor, but collectively significant actions that take place over time. Accordingly, a cumulative effects 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 effects are most likely to occur when there is an overlapping geographic location and a coincidental or sequential timing of events.

For the purposes of this analysis, the temporal span of Alternative 1 and Alternative 2 is considered the time during which the LCSs would be homeported (i.e., between 2016 and 2020). For most resources, the spatial area for consideration of cumulative effects is limited to the installation on which an activity would occur, which could include multiple installations (i.e., NAVSTA Mayport, NSB Kings Bay, NAVSTA Norfolk, and MCAS Cherry Point). Past actions are those actions, and their associated impacts, that occurred within the geographical extent of cumulative effects that have shaped the current environmental conditions of the project area. CEQ regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions (Connaughton 2005). The effects of past actions are now part of the existing environment and are included in the affected environment described in **Section 3**. However, recent past actions with continuing ongoing effects that are germane to cumulative impacts are discussed with present and reasonably foreseeable future actions.

4.1.1 Projects Considered for Potential Cumulative Effects

4.1.1.1 Other Projects at NAVSTA Mayport

Under the NAVSTA Mayport Scenario, all LCS homeporting activities would occur at NAVSTA Mayport. Existing military assets and new construction would provide the necessary berthing space, ship hotel services (utilities), maintenance support, drydocking facilities, fueling services, ordnance handling and storage, cargo handling and storage, and stationing for personnel and their family members. Under the NSB Kings Bay Scenario, LCS homeporting would occur at NAVSTA Mayport, but one LCS facility would be at NSB Kings Bay. This section describes other activities at NAVSTA Mayport for analysis of the cumulative effects of either scenario under Alternative 1. Other activities at NSB Kings Bay for analysis of the cumulative effects are discussed in **Section 4.1.1.2**.

Changes in Homeported Vessels and Personnel. Between 2010 and 2020, NAVSTA Mayport will undergo changes in homeported vessels and personnel. Cumulatively, it is anticipated that by 2020 there would be slightly more vessels and personnel based at NAVSTA Mayport than 2010 levels under at the NAVSTA Mayport Scenario and NSB Kings Bay Scenario (CNO 2012).

FFG class ships at NAVSTA Mayport are undergoing phased decommissioning between 2011 and 2015 (Navy 2011f). Three cruisers homeported at NAVSTA Mayport are scheduled to be decommissioned as well in the next few years. It is anticipated that FFG decommissioning will make available berthing and infrastructure (e.g., power and pier space) for other vessels to be homeported (Mabus 2011). NAVSTA Mayport is expected to experience some fluctuations in total destroyers and cruisers due to pending force structure reductions and a destroyer homeport shift to Rota, Spain. The total number of destroyers and cruisers at NAVSTA Mayport would remain relatively steady as LCSs begin arriving in 2016. NAVSTA Mayport will also be the homeport to a three-ship Amphibious Ready Group and patrol craft over the next few years. NAVSTA Mayport is also slated to receive one nuclear-powered CVN, but this is expected to occur outside the temporal span considered in this cumulative effects analysis (Vlcek 2012); a more detailed discussion of this action is included at the end of **Section 4.1.1.1**. Estimated changes in cumulative personnel and family as a result of changes in homeported vessels and the LCS homeporting by alternative scenario are summarized in **Table 4-1**.

Table 4-1. Estimated Changes in Afloat Stationed Personnel and Family Members at NAVSTA Mayport under the NAVSTA Mayport Alternative

	2010	2016	2020
Baseline Estimated Personnel Associated with Homeported Vessels			
Total Personnel	4,930	3,590	3,590
Total Family Members [1]	5,530	4,030	4,030
Total	**10,460**	**7,620**	**7,620**
NAVSTA Mayport Alternative [2]			
Total Personnel	0	425	1,700
Total Family Members [1]	0	475	1,900
Cumulative Total	**10,460**	**8,520**	**11,220**

Sources for estimates of personnel: Navy 2011f, Navy 2011g, Navy 2011h, Navy 2011i, Navy 2011j, Navy 2011k, Navy 2011l, and CNO 2012

Notes:

1. Assumes 1.12 family members per person.
2. This alternative assumes that 21 crews and their associated family members would be on the installation. The distribution of personnel and family members between 2016 and 2020 is assumed to be proportional to the number of LCS vessels for this analysis. Estimates are rounded up.

Construction and Capital Improvement Projects. **Table 4-2** summarizes existing and planned waterfront projects or road network projects at NAVSTA Mayport.

Nuclear-Powered Aircraft Carrier Homeporting. The Navy prepared NEPA documentation and signed a Record of Decision for the homeporting of one nuclear-powered CVN at NAVSTA Mayport (Navy 2008, Navy 2009c). Homeporting the CVN would be a multi-year process for developing operational, maintenance, and support facilities at NAVSTA Mayport. Necessary projects would include dredging and dredged material disposal, construction of CVN propulsion plant maintenance facilities, wharf improvements, transportation improvements, and construction of a replacement parking structure. All of these projects must be completed before the CVN can be homeported (Navy 2009c). The current estimated timeline for homeporting the CVN is after 2020, which is outside the timeframe for this cumulative impacts analysis (Vlcek 2012). Construction activities for CVN homeporting could reasonably occur within the next few years to support the homeporting, and these projects are included in **Table 4-2** and the cumulative effects analysis.

Table 4-2. Existing and Reasonably Foreseeable Waterfront Projects and Road Network Projects at NAVSTA Mayport

Project Name	Description	Project Number	Date
Wharf C Improvements	Recapitalizes and adds a second deck to Wharf C-1.	P-777	2011
Recapitalize Deep Draft Berth C-2	Recapitalizes Wharf C-2.	RM12-0509	2012
Undersea Warfare Training Range Cable Termination Facility	Constructs a 900-ft^2 building to provide the termination point for the data cable from the underwater range.	NF10-7562	2013
Massey Avenue Corridor Improvements	Adds additional lanes, improves intersections for Massey Avenue and adjacent intersections to improve traffic congestion.	P-503	2013
Indoor Small Arms Range	Constructs an indoor small arms range to replace the existing outdoor range.	P-192	2018
Jet Engine Test Cell	Constructs an indoor jet engine test facility for out-of-airframe testing of helicopter engines. This project would replace the existing outdoor facility.	P-254	UP
U.S. Fourth Fleet Command Headquarters	Constructs an administrative building. This building would replace five buildings that presently house Navy staff.	P-332	UP
Vertical Launching System Missile Magazine	Constructs a box-style, earth-covered ordnance magazine to replace the existing arch-style, earth-covered magazine.	P-421	UP
Structural/Aircraft Fire/Rescue Station	Constructs a combined structural and aircraft fire/rescue station to replace the two existing single function stations.	P-702	UP
Bravo Wharf Recapitalization	Recapitalizes Wharves B-1/B-2/B-3.	RM12-0524	UP
Broad Area Maritime Surveillance Unmanned Aircraft System MQ-4 Aircraft Maintenance Hangar	Constructs an aircraft maintenance hangar to support the Broad Area Maritime Surveillance unmanned aircraft. Hangar might be built at NAVSTA Mayport or NAS Jacksonville. Pre-decisional planning effort.	P-193	UP
New Wastewater Treatment Plant/Connection Local Utility	Construct a new wastewater treatment plant or connect wastewater system to the local wastewater utility. Alternative feasibility study is underway.	--	UP
Wharf F Improvements	Includes upgrades to utilities, minor structural improvements, and installation of heavy weather moorings to Wharf F to support maintenance berthing for a CVN. Project is part of the NAVSTA Mayport Homeporting EIS.	P-186	UP

Project Name	Description	Project Number	Date
Controlled Industrial Facility	Constructs a heavy industrial building to support the controlled maintenance for a CVN. Project is part of the NAVSTA Mayport Homeporting EIS.	P-250	UP
Ships Maintenance Facility	Constructs a heavy industrial building to support the non-controlled maintenance for a CVN. Project is part of the NAVSTA Mayport Homeporting EIS.	P-251	UP
Parking Garage	Constructs a three-story parking garage to replace the parking that would be eliminated with the construction of projects P-250/P-251. Project is part of the NAVSTA Mayport Homeporting EIS.	P-502	UP

Source: Navy undated
Key: UP = Unprogrammed

Even though the homeporting of a CVN is planned to occur outside the timeframe of this analysis, it is a major action and, therefore, it is briefly discussed in more detail here. Dredging and dredged material disposal were identified as necessary projects to accommodate a CVN at NAVSTA Mayport. Dredging activities were accomplished in 2010. Past dredging would not be expected to have cumulative effects when considered with LCS homeporting because no additional dredging is required to support the LCSs. Furthermore, impacts on the benthic community associated with dredging and disposal would be minimal and temporary (Navy 2009b), and LCS homeporting would not be expected to have any impact on the benthic recovery process.

Approximately 3,190 total personnel plus dependents would arrive at NAVSTA Mayport with the CVN (Navy 2008). In the timeframe discussed in this EA (i.e., 2010 through 2020), this represents an increase in personnel. The Homeporting EIS used a baseline of 2006 because that was the last year when the conventionally powered aircraft carrier USS John F. Kennedy (CV 67) was stationed with a full crew at NAVSTA Mayport. The Homeporting EIS concluded that the net daily population and the number of homeported ships would decrease as a result of decommissioning the USS John F. Kennedy, decommissioning of the FFGs, and downsizing of the Southeast Regional Maintenance Center (Navy 2009c). When the 2006 baseline of the Homeporting EIS is considered in the context of this EA, the cumulative personnel and number of homeported ships in 2006 would also be greater than estimated 2020 and beyond levels, assuming that the CVN arrives after 2020. Therefore, it is not anticipated that the addition of the CVN in the years after the LCS homeporting would overburden infrastructure or other services because NAVSTA Mayport supported a greater number in the recent past.

4.1.1.2 Other Projects at NSB Kings Bay

Under the NSB Kings Bay Scenario, the MMRC would be constructed at NSB Kings Bay with only minor exterior work, if any. Cumulative environmental effects at NSB Kings Bay would primarily be associated with increases in personnel.

In 2011, an EA was prepared and a FONSI signed for the establishment of Transit Protection System Facilities at NSB Kings Bay and the open ocean. This project consists of using up to 16 armed escort vessels, adding approximately 507 feet per segment by installing 250 new pilings, installing fuel lines in the pier and berthing area, and constructing a new office building to house 150 additional personnel (Navy 2012d). For consistency with this analysis and in trying to provide a conservative approach, it is

assumed that 1.12 family members would accompany the 150 additional personnel, so the total increase at NSB Kings Bay from this project is estimated at approximately 320 people.

For the purposes of the NSB Kings Bay Scenario, it is assumed that 30 personnel would be needed to support the LCS homeporting at NSB Kings Bay. If an additional 1.12 family members per personnel are assumed (i.e., approximately 34 family members), then the NSB Kings Bay Scenario would contribute approximately 64 additional people at NSB Kings Bay by 2020.

Cumulatively, when also considering the additional personnel for the Transit Protection System Facilities, personnel at NSB Kings Bay would be expected to increase by approximately 384 people.

4.1.1.3 Other Projects at NAVSTA Norfolk

Under the NAVSTA Norfolk Alternative, all LCS homeporting activities would occur at NAVSTA Norfolk. Existing military assets and new construction would provide the necessary berthing space, ship hotel services (utilities), maintenance support, drydocking facilities, fueling services, ordnance handling and storage, cargo handling and storage, and stationing for personnel and their family members.

Changes in Homeported Vessels and Personnel. Between 2010 and 2020, NAVSTA Norfolk will undergo changes in homeported vessels and personnel. The Navy plans to decommission some vessels, such as FFGs and others, and will also strategically shift vessels over the coming years (CNO 2012). NAVSTA Norfolk has the largest supported population of any naval installation (Navy 2011n). **Table 4-3** summarizes estimated changes in personnel and family members, including the proposed LCS homeporting, at NAVSTA Norfolk under the NAVSTA Norfolk Alternative. Cumulatively, it is anticipated that by 2020, there would be approximately the same number of vessels and slightly fewer personnel based at NAVSTA Norfolk than 2010 levels under the NAVSTA Norfolk Alternative (CNO 2012).

Table 4-3. Estimated Changes in Stationed Personnel and Family Members at NAVSTA Norfolk under the NAVSTA Norfolk Alternative

	2010	2016	2020
Baseline Estimated Personnel Associated with Homeported Vessels			
Total Personnel	41,500	38,080	39,620
Total Family Members [1]	46,480	42,650	44,380
Total	**87,980**	**80,730**	**84,000**
NAVSTA Norfolk Alternative [2]			
Total Personnel	0	425	1,700
Total Family Members [1]	0	475	1,900
Cumulative Total	**87,980**	**81,630**	**87,600**

Sources for estimates of personnel: Navy 2011k, Navy 2011h, Navy 2012e, Navy 2011g, Navy 2011f, Navy 2011l, Navy 2011j, Navy 2011m, Navy 2012f, and CNO 2012

Notes:

1. Assumes 1.12 family members per person.
2. This assumes that 21 crews and their associated family members would be on the installation. The distribution of personnel and family members between 2016 and 2020 is assumed to be proportional to the number of LCS vessels for this analysis. Estimates are rounded up.

NAVSTA Norfolk Waterfront Recapitalization. Key initiatives within NAVSTA Norfolk's Waterfront District include moving functions that are currently non-compliant with accident potential zones, consolidating training and administrative uses into concentrated centers, integrating support services in higher density centers with improved pedestrian connections, mitigating storm water runoff and heat island effects of parking areas along waterfront, consolidating warehousing, continuing development of Sailor Ashore housing, and reusing former warehouse facilities for operations. The area where the proposed LCS facilities would be located on NAVSTA Norfolk is targeted as a future higher density mixed-use development with support service (the eastern portion) and a recreation and open space expansion area (the western portion) (NAVFAC 2011a).

4.1.1.4 Other Projects at MCAS Cherry Point

Under either alternative, MCAS Cherry Point would be used for Firescout storage and maintenance. This would result in approximately 360 test flights per year within local MCAS Cherry Point airspace. Helicopters and UAVs already operate at MCAS Cherry Point, so the storage and maintenance of the Firescout, including test flights, is similar to the existing conditions. No new training or military operations would be associated with storing and maintaining the Firescout for the LCS mission. No new airspace would be required for test flights. Approximately 30 personnel would be added, and it is also assumed that approximately 34 family members would accompany personnel. No facility construction would be required to accommodate Firescouts or personnel. Cumulative environmental effects at MCAS Cherry Point would primarily be associated with increases in flight operations and personnel.

There are 145 assigned aircraft, including the AV-8B Harrier II, EA-6B Prowler, and C-130 Hercules, that are operated and maintained at MCAS Cherry Point; and other aircraft, including UAVs. There are an estimated 116,000 to 120,000 annual flight operations at MCAS Cherry Point (MCAS Cherry Point 2011b, MCAS Cherry Point 2002). The U.S. Marine Corps recently prepared an EA addressing range operations at MCAS Cherry Point (MCAS Cherry Point 2009b). It is anticipated over the next 5 years that the types of training activities conducted at MCAS Cherry Point would remain essentially the same, but helicopter operations would increase to provide more training.

As a result of the recently passed U.S. Marine Corps Grow the Force Initiative, the eastern region of North Carolina has undergone unprecedented military growth in the vicinity of Marine Corps Base Camp Lejeune, MCAS New River, and MCAS Cherry Point. Including new military personnel, civilians, family members, and induced growth, approximately 40,000 new residents were expected between 2006 and 2011, a 60 percent regional increase. At MCAS Cherry Point, growth was a 10.8 percent increase (1,485 active-duty military and civilians). The U.S. Marine Corps partnered with local communities to plan for and address growth challenges associated with traffic congestion, shortages of health care professionals, and the strain on emergency responders and courts (DOD OEA 2009). The total population at MCAS Cherry Point is estimated at 30,000 (MCAS Cherry Point 2011b).

4.1.2 Cumulative Effects on Resource Areas

The following analysis examines the impact on the environment that would result from the incremental impact of the NAVSTA Mayport Scenario (Scenarios 1 and 2), the NAVSTA Norfolk Alternative, and at MCAS Cherry Point, in addition to other past, present, and reasonably foreseeable future actions. Cumulative effects can result from individually minor, but collectively significant, actions taking place over a period of time. This analysis assesses the potential for an overlap of impacts with respect to project schedules or affected areas. This section presents a qualitative analysis of the cumulative effects, based on considerable activities anticipated for each project (e.g., changes in homeported vessels and stationed personnel).

The Navy has evaluated the alternatives in conjunction with other past, present, and reasonably foreseeable future actions to determine whether cumulative effects on the human environment would occur. No significant cumulative effects were identified at NAVSTA Mayport, NSB Kings Bay, NAVSTA Norfolk, or MCAS Cherry Point in the cumulative effects analysis.

None of the Proposed Action alternatives or the component would have an effect on land use and coastal zone management and, thus, would not contribute to cumulative effects on these resources. Therefore, these resources are not included in this cumulative effects analysis.

Under the No Action Alternative, there would be no change in the baseline conditions for any resources areas. Therefore, the No Action Alternative would not contribute to cumulative effects.

4.1.2.1 Noise

NAVSTA Mayport Alternative

NAVSTA Mayport Scenario. This alternative scenario would not result in significant effects on the noise environment. Construction activities occurring at the same time and in the same vicinity could have cumulative effects; however they would not be significant. Overall, construction-related activities at and within NAVSTA Mayport (see **Table 4-2**) could collectively increase noise levels in the area temporarily, but variations in the timing of cumulative projects, and the relatively short duration of project effects, would distribute impacts over space and time.

Between 2010 and 2020, the cumulative number of homeported vessels is expected to increase from 19 to 20 vessels. The types of noises and the noise levels generated by port services would be similar to those that have historically occurred at NAVSTA Mayport. The cumulative number of personnel and family members is anticipated to increase by approximately 760 people between 2010 and 2020, which could slightly increase automobile traffic associated noise at NAVSTA Mayport. This alternative scenario would not result in significant cumulative effects on the noise environment.

NAVSTA Mayport-NSB Kings Bay Scenario. This alternative scenario would not result in significant effects on the noise environment. Renovation and construction activities occurring at the same time and in the same vicinity could have cumulative effects. Overall, construction-related activities at and within NSB Kings Bay could collectively increase noise levels in the area temporarily, but variations in the timing of cumulative projects, and the relatively short duration of project effects, would distribute impacts over space and time.

The cumulative number of personnel and family members is anticipated to increase at NSB Kings Bay by approximately 384 people, as discussed in **Section 4.1.1.2**. This would result in minor increases in automobile traffic and associated noise. Vehicles used by the family members of military personnel would be driven to the installation occasionally. In addition, with varying work schedules, deployments, mass transit options, and carpooling, the additional vehicle trips would be intermittent. Given that the additional vehicles would be intermittent, it is not anticipated that this increase would result in significant cumulative effects on the noise environment at NSB Kings Bay.

Cumulative effects at NAVSTA Mayport under the NSB Kings Bay Scenario would be essentially the same as those described under the NAVSTA Mayport Scenario. The number of homeported vessels would cumulatively increase by one and the population would increase by an estimated 760 people between 2010 and 2020. No significant cumulative effects on the noise environment at NAVSTA Mayport would be expected.

NAVSTA Norfolk Alternative

This alternative would not result in significant effects on the noise environment. Construction activities occurring at the same time and in the same vicinity could have cumulative effects. Overall, construction-related activities at and within NAVSTA Norfolk could collectively increase noise levels in the area temporarily, but variations in the timing of cumulative projects, and the relatively short duration of project effects, would distribute impacts over space and time.

Between 2010 and 2020, the cumulative number of homeported vessels is expected to remain approximately the same. The types of noises generated and the noise levels would be similar to those that have historically occurred at NAVSTA Norfolk.

The cumulative number of personnel and family members is anticipated to decrease slightly between 2010 and 2020, which could slightly decrease automobile traffic and associated noise at NAVSTA Norfolk. Noise from aircraft operations at Chambers Field and vessel and cargo movements along the waterfront would remain the dominant noise sources. At this time there are no known projects that would result in an increase in personnel. This alternative would not result in significant cumulative effects on the noise environment.

MCAS Cherry Point

The Firescout program would not result in significant effects on the noise environment. Maintenance and test flights of the Firescout would generate noise at MCAS Cherry Point. Increased helicopter training could also increase noise levels. Cumulatively, noise levels would continue to be dominated by fixed-wing aircraft, and it is anticipated that noise from the Firescout operations would contribute negligibly. No significant cumulative effects would be expected.

4.1.2.2 Air Quality

NAVSTA Mayport Alternative

NAVSTA Mayport Scenario. This alternative scenario would not result in significant effects on air quality. Construction activities occurring at the same time and in the same vicinity could have cumulative effects. Overall, construction-related activities at and within NAVSTA Mayport (see **Table 4-2**) could collectively increase emissions of criteria air pollutants in the area temporarily, but variations in the timing of cumulative projects, and the relatively short duration of project effects, would distribute impacts over space and time.

Between 2010 and 2020, the cumulative number of homeported vessels is expected to increase from 19 to 20 vessels. The cumulative number of personnel and family members is anticipated to increase slightly between 2010 and 2020, which would increase air emissions from automobiles locally at NAVSTA Mayport. Given that the Jacksonville-Brunswick Interstate AQCR is in attainment for all criteria pollutants, none of these cumulative activities would be expected to result in a violation of any national or state ambient air quality standards. Nor would cumulative activities be expected to expose sensitive receptors to substantially increased pollutant concentrations. This alternative scenario would not result in significant cumulative effects on air quality.

GHG emissions that would be associated with this alternative scenario are not required to be included in the GHG reduction goals within EO 13514. As per Section 19(h) of EO 13514, emissions from any vehicle, vessel, aircraft, or non-road equipment owned or operated by the DOD that are used in combat support, combat service support, tactical or relief operations, or training for such operations, are excluded

from DOD reduction targets. Although currently there is no regulatory mechanism at the facility level for requiring GHG reductions from the affected operations, the Navy recognizes there are opportunities for GHG reductions from such operations, such as implementing alternative fuels and other renewable energy sources where possible. The Navy has established several goals for reducing GHG emissions, including the following:

- Mandate that energy use, efficiency, life-cycle costs, and other such factors be part of the Navy's decision when acquiring new equipment systems, and a part of vendor's efficiency or energy policies.
- By 2015, cut petroleum use by half in the Navy's fleet of commercial vehicles by phasing in new hybrid trucks to replace older ones.
- By 2020, procure half the power at Navy shore installations from alternative energy sources, and where possible, supply power back to the grid.
- By 2020, reach the goal that half of the Navy's total energy consumption for ships, aircraft, tanks, vehicles, and shore installations comes from alternative energy sources.

While this alternative scenario would slightly increase GHG emissions locally, on a national level there would be a slight increase in GHG emissions, less than 0.0002 percent of the nationwide inventory. Therefore, cumulative effects from GHG emissions at NAVSTA Mayport would not be significant. In addition, attainment of the goals described would more than offset the GHG emissions increases from this alternative scenario.

NAVSTA Mayport-NSB Kings Bay Scenario. This alternative scenario would not result in significant effects on air quality. Renovation and construction activities occurring at the same time and in the same vicinity could have cumulative effects. Overall, construction-related activities at and within NSB Kings Bay could collectively increase emissions of criteria air pollutants in the area temporarily, but variations in the timing of cumulative projects, and the relatively short duration of project effects, would distribute impacts over space and time.

The cumulative number of personnel and family members is anticipated to increase at NSB Kings Bay, which could slightly increase air emissions from automobiles locally. NAVSTA Mayport and NSB Kings Bay are both within the Jacksonville-Brunswick Interstate ACQR, so, cumulatively, all changes in air emissions would be within the same regional airshed. The Jacksonville-Brunswick Interstate AQCR is in attainment for all criteria pollutants. None of these cumulative activities would be expected to result in a violation of any national or state ambient air quality standards, nor would cumulative activities be expected to expose sensitive receptors to substantially increased pollutant concentrations. When added to the effects from other activities, this alternative scenario would not result in significant cumulative effects on air quality at NSB Kings Bay.

Cumulative effects at NAVSTA Mayport under the NSB Kings Bay Scenario would not be significant. No significant cumulative effects on air quality at NAVSTA Mayport would be expected.

Cumulative effects from GHG emissions at NAVSTA Mayport and NSB Kings Bay would not be significant. See discussion under the NAVSTA Mayport Scenario.

NAVSTA Norfolk Alternative

This alternative would not result in significant effects on air quality. Overall, construction-related activities at and within NAVSTA Norfolk could collectively increase air emissions of criteria air

pollutants in the area temporarily, but variations in the timing of cumulative projects, and the relatively short duration of project effects, would distribute impacts over space and time. Between 2010 and 2020, the cumulative number of homeported vessels is expected to remain the same. The cumulative number of personnel and family members is anticipated to slightly decrease between 2010 and 2020, which would slightly decrease air emissions from automobiles locally at NAVSTA Norfolk. The Hampton Roads Interstate AQCR is a maintenance area for ozone and in attainment for all other criteria pollutants. None of these cumulative activities would be expected to result in a violation of any national or state ambient air quality standards, nor would cumulative activities be expected to expose sensitive receptors to substantially increased pollutant concentrations. In the long-term, cumulative air emissions could decrease; this would be a beneficial effect. When added to the effects from other activities, this alternative would not result in significant cumulative effects on air quality.

Cumulative effects from GHG emissions at NAVSTA Norfolk would not be significant. See discussion under the NAVSTA Mayport Scenario.

MCAS Cherry Point

The Firescout program would not result in significant effects on air quality. Maintenance activities, test flights, and vehicle emissions from increased commuters would result in criteria pollutant and GHG emissions from fuel combustion. Increased helicopter training activities would also increase air emissions. Given that the Southern Coastal Plain Intrastate AQCR is in attainment for all criteria pollutants, none of these cumulative activities would be expected to result in a violation of any national or state ambient air quality standards, nor would cumulative activities be expected to expose sensitive receptors to substantially increased pollutant concentrations. Cumulative GHG emissions would represent a slight contribution to statewide and national GHG inventories. No significant cumulative effects would be expected.

4.1.2.3 Human Health and Safety

NAVSTA Mayport Alternative

NAVSTA Mayport Scenario. This alternative scenario would not result in significant effects on health and safety. All construction-related activities, including identification and removal of ACM, LBP, 8-RCRA metals, and PCBs, would comply with Federal and state regulations and applicable NAVSTA Mayport management plans. The removal of ACM, LBP, and PCB during demolition activities would result in cumulative effects by reducing potential exposure to personnel accessing facilities containing these materials, though these effects would not be significant.

Cumulatively, NAVSTA Mayport is expected to experience an increase in homeported vessels, which would also result in slight increase in ordnance and sources of electromagnetic radiation. Types of ordnance and storage, handling, and loading areas and practices would be similar to the existing conditions, and so these effects would not be significant. New electromagnetic sources would be minimal and similar to civilian navigational aids and radars at local airports and television weather stations throughout the United States. When added to the effects from other activities, this alternative scenario would not result in significant cumulative effects on human health and safety.

NAVSTA Mayport-NSB Kings Bay Scenario. This alternative scenario would not result in significant effects on health and safety. All construction-related activities, including identification and removal of ACM, LBP, and PCB, would comply with Federal and state regulations and applicable NAVSTA Mayport and NSB Kings Bay management plans. The removal of ACM, LBP, 8-RCRA metals, and PCBs during renovation activities at NSB Kings Bay would result in cumulative effects by reducing

potential exposure to personnel accessing facilities containing these materials. When added to the effects from other activities, this alternative scenario would not result in significant cumulative effects on human health and safety at NSB Kings Bay.

Cumulative effects at NAVSTA Mayport under the NSB Kings Bay Scenario would be essentially the same as those described under the NAVSTA Mayport Scenario. No significant cumulative effects on human health and safety at NAVSTA Mayport would be expected.

NAVSTA Norfolk Alternative

This alternative would not result in significant effects on health and safety. All construction-related activities, including identification and removal of ACM, LBP, and PCBs, would comply with Federal and state regulations and applicable NAVSTA Norfolk management plans. The removal of ACM, LBP, and PCBs during demolition activities at NAVSTA Norfolk would result in cumulative effects by reducing potential exposure to personnel accessing facilities containing these materials. Cumulatively, the number of homeported vessels at NAVSTA Norfolk is expected to remain the same, so no effects from electromagnetic radiation or ordnance handling would be expected. When added to the effects from other activities, this alternative would not result in significant cumulative effects on human health and safety.

MCAS Cherry Point

The Firescout program would be expected to have no significant effects on flight safety at MCAS Cherry Point. Approximately 360 Firescout test flights would occur each year at MCAS Cherry Point. In the context of total flight operations, which is more than 100,000 annually, this represents a minor increase in annual aircraft operations. It is not anticipated that the cumulative increased flight operations would increase bird/wildlife aircraft strikes or risks of other mishaps. No significant cumulative effects on flight safety and human health and safety would be expected.

4.1.2.4 Geological Resources

NAVSTA Mayport Alternative

NAVSTA Mayport Scenario. Soils have been previously disturbed at NAVSTA Mayport due to past development activities. Construction activities occurring in the same time and in the same vicinity could have cumulative effects on soil resources from disturbance and a potential increase in erosion. This alternative scenario would not result in significant, cumulative effects on geological resources.

NAVSTA Mayport-NSB Kings Bay Scenario. This alternative scenario would have no effect on geological resources at NAVSTA Mayport or NSB Kings Bay, and, therefore, would not contribute to cumulative effects on geological resources. No significant cumulative effects would be expected.

NAVSTA Norfolk Alternative

This alternative would not result in significant effects on geological resources. Construction activities occurring in the same time and in the same vicinity could have cumulative effects on soil resources from disturbance and a potential increase in erosion. However, soils have been previously disturbed at NAVSTA Norfolk due to past development activities. This alternative would not result in significant cumulative effects on geological resources.

MCAS Cherry Point

The Firescout program would have no effect on geological resources at MCAS Cherry Point, and, therefore, would not contribute to cumulative effects on geological resources. No significant cumulative effects would be expected.

4.1.2.5 Biological Resources

NAVSTA Mayport Alternative

NAVSTA Mayport Scenario. This alternative scenario would not result in significant effects on biological resources. Construction activities occurring in the same time and in the same vicinity could have cumulative effects on vegetation and wildlife resources from habitat removal and noise disturbances. However, there is minimal habitat available due to the developed and urban environment at NAVSTA Mayport, and most species present are adapted to noisy environs. Between 2010 and 2020, the cumulative number of homeported vessels is expected to slightly increase. However, the nearshore vessel movements would not be expected to pose new risks or dramatically increase nearshore vessel traffic. Cumulatively, planned construction activities, vessel movements, and cargo handling could slightly increase noise levels and result in some habitat disturbances. However, none of these activities would be significant. As discussed in **Section 3.6.3.1**, construction activities, portside cargo and mission module movements, and vessel movements would be expected to have negligible effects on terrestrial protected species, and migratory birds due the high levels of existing noise and pierside and in-water activities. Cumulatively, significant effects on protected and sensitive species would not be expected. When added to the effects from other activities, this alternative scenario would not result in significant cumulative effects on biological resources.

NAVSTA Mayport-NSB Kings Bay Scenario. This alternative scenario would not result in significant effects on biological resources. Renovation and construction activities occurring in the same time and in the same vicinity could have cumulative effects on wildlife resources from noise disturbances. Negligible ground disturbance would occur from this alternative scenario, so it would have little potential to have any cumulative contributions to vegetation removal. There is minimal habitat due to the developed and urban environment at NSB Kings Bay, and most species present are adapted to noisy environs. Cumulatively, adverse effects on vegetation, wildlife, and protected and sensitive species would not be expected. When added to the effects from other activities, this alternative scenario would not result in significant cumulative effects on biological resources at NSB Kings Bay.

Cumulative effects at NAVSTA Mayport under the NSB Kings Bay Scenario would be essentially the same as those described under the NAVSTA Mayport Scenario. No significant cumulative effects on biological resources at NAVSTA Mayport would be expected.

NAVSTA Norfolk Alternative

This alternative would not result in significant effects on biological resources. Construction activities occurring in the same time and in the same vicinity could have cumulative effects on vegetation and wildlife resources from habitat removal and noise disturbances. However, there is minimal habitat available due to the developed and urban environment at NAVSTA Norfolk, and most species present are adapted to noisy environs. Between 2010 and 2020, the cumulative number of homeported vessels is expected to remain approximately the same with minor fluctuations; nearshore vessel movements would not be expected to pose new risks or increase nearshore vessel traffic. Cumulatively, planned construction activities, vessel movements, and cargo handling could slightly increase noise levels and result in some habitat disturbances. However, none of these activities would be significant. As discussed

in **Section 3.6.3.2**, construction activities, portside cargo and mission module movements, and vessel movements would be expected to have negligible effects on terrestrial protected species, and migratory birds due the high levels of existing noise and pierside and in-water activities. Cumulatively, significant effects on protected and sensitive species would not be expected. When added to the effects from other activities, this alternative would not result in significant cumulative effects on biological resources.

MCAS Cherry Point

The Firescout program would have no significant effects on biological resources at MCAS Cherry Point. Firescout operations at MCAS Cherry Point would not be expected to increase noise levels noticeably or increase the risk of bird/wildlife-aircraft strikes. Given the current levels of air traffic at MCAS Cherry Point, protected and sensitive species using nearby habitat would be expected to have become habituated to aircraft noise. No significant cumulative effects would be expected.

4.1.2.6 Water Resources

NAVSTA Mayport Alternative

NAVSTA Mayport Scenario. This alternative scenario would not result in significant effects on water resources. Implementation of the NAVSTA Mayport Scenario and other construction projects would result in a minor increase in impervious surfaces and storm water runoff. Use of BMPs and implementation of an Erosion-and-Sediment-Control Plan and SWPPP during construction activities would minimize cumulative effects on water resources. When added to the effects from other activities, this alternative scenario would not result in significant cumulative effects on water resources.

NAVSTA Mayport-NSB Kings Bay Scenario. This alternative scenario would have no effect on water resources at NAVSTA Mayport and NSB Kings Bay, and, therefore, would not contribute to cumulative effects on water resources. No significant cumulative effects would be expected.

NAVSTA Norfolk Alternative

This alternative would not result in significant effects on water resources. Implementation of the NAVSTA Norfolk Scenario and other construction projects in the NAVSTA Norfolk waterfront area would result in a minor increase in impervious surfaces and storm water runoff. Use of BMPs and implementation of an Erosion-and-Sediment-Control Plan and SWPPP during construction activities would minimize cumulative effects on water resources. When added to the effects from other activities, this alternative would not result in significant cumulative effects on water resources.

MCAS Cherry Point

The Firescout program would have no effect on water resources at MCAS Cherry Point, and, therefore, would not contribute to cumulative effects on water resources. No significant cumulative effects would be expected.

4.1.2.7 Socioeconomics and Environmental Justice

NAVSTA Mayport Alternative

NAVSTA Mayport Scenario. This alternative scenario would not result in significant effects on socioeconomic resources or environmental justice. Cumulatively, short- and long-term effects on the installation and the local economy would be expected as a result of construction expenditures associated

with multiple projects and the increase in homeported vessels and stationed personnel. The increase in school-aged children would represent approximately 1.5 percent of the current public school enrollment for the Duval County School System. At this time, there are no other known projects that would contribute to the school populations. This alternative scenario would not result in significant cumulative effects on socioeconomic resources. Adverse environmental effects associated with this alternative scenario would not be expected to affect off-installation populations, so no significant cumulative effects on environmental justice would be expected.

NAVSTA Mayport-NSB Kings Bay Scenario. This alternative scenario would not result in significant effects on socioeconomic resources or environmental justice. Cumulatively, short- and long-term effects on the installation and the local economy would be expected as a result of construction expenditures associated with multiple projects and the increase in homeported vessels. At NAVSTA Mayport, there would be a slight cumulative increase in stationed personnel by 2020, which would be similar to effects described for the NAVSTA Mayport Scenario. At NSB Kings Bay, there would be a slightly cumulative increase in stationed personnel. This alternative scenario would not result in significant cumulative effects on socioeconomic resources. Adverse environmental effects associated with this alternative scenario would not be expected to affect off-installation populations, so no significant cumulative effects on environmental justice would be expected.

NAVSTA Norfolk Alternative

This alternative would not result in significant effects on socioeconomic resources or environmental justice. Cumulatively, short-term effects on the installation and the local economy would be expected as a result of construction expenditures associated with multiple projects. Cumulatively, the number of homeported vessels under the NAVSTA Norfolk Alternative would be the same in 2020 as in 2010, though the interim years could see various changes in the number and types of homeported vessels as some are decommissioned and others are shifted to and from other installations. The number of stationed personnel and their family members would be expected to decrease in 2020 from 2010 levels. The Norfolk Metropolitan Statistical Area is heavily populated; the decrease in population at NAVSTA Norfolk between 2010 and 2020 would be approximately a 0.06 percent change. When added to the effects from other activities, this alternative would not result in significant cumulative effects on socioeconomic resources. Environmental impacts associated with this alternative scenario would not be expected to affect off-installation populations, so no significant cumulative effects on environmental justice would be expected.

MCAS Cherry Point

The Firescout program would not result in significant effects on socioeconomic resources at MCAS Cherry Point. The number of stationed personnel and their family members would increase to support the Firescout program. This region has recently undergone tremendous military growth as a result of the Grow the Force Initiative. As part of the military influx, local and regional improvements were made to accommodate the increased growth. The increase of 30 personnel and 34 dependents at MCAS Cherry Point would be a slight increase within the New Bern Metropolitan Statistical Area, particularly when considered with recent past regional military increases as a result of the Grow the Force Initiative. No significant cumulative effects would be expected from the Firescout program.

4.1.2.8 Utilities, Infrastructure, and Transportation

NAVSTA Mayport Alternative

NAVSTA Mayport Scenario. This alternative scenario would not result in significant effects on utilities, infrastructure, or transportation systems. Cumulatively, all construction-related activities could result in increased use of infrastructure or possibly brief periods when services are interrupted for utility interconnections. These cumulative effects would not be significant. Beneficial, cumulative effects would be expected as utility, infrastructure, and transportation systems are upgraded and modernized for new facilities and to accommodate new vessels. By 2020, NAVSTA Mayport is expected to experience an increase in homeported vessels and in stationed personnel, when referenced against 2010 levels. Increases in homeported vessels and stationed personnel could result in increased demand on some infrastructure systems, such as liquid fuel, potable water, electricity, and the transportation network. During the interim years, effects on utilities and infrastructure systems, particularly transportation systems, could seem more noticeable as the total, cumulative population (including dependents) at NAVSTA Mayport fluctuates by several thousand people. Utilities and infrastructure have adequate capacity for growth. When added to the effects from other activities, this alternative scenario would not result in significant cumulative effects on utilities, infrastructure, or transportation systems.

NAVSTA Mayport-NSB Kings Bay Scenario. This alternative scenario would not result in significant effects on utilities, infrastructure, or transportation systems. No new facilities would be constructed at NSB Kings Bay. Cumulatively, the daily population at NSB Kings Bay would increase, which would increase use of utilities and roadways. Utilities and infrastructure at both installations have adequate capacity for growth. When added to the effects from other activities, this alternative scenario would not result in significant cumulative effects on utilities, infrastructure, or transportation systems at NSB Kings Bay.

Cumulative effects at NAVSTA Mayport under the NSB Kings Bay Scenario would be essentially the same as those described under the NAVSTA Mayport Scenario. No significant cumulative effects on utilities, infrastructure, or transportation systems at NAVSTA Mayport would be expected.

NAVSTA Norfolk Alternative

This alternative would not result in significant effects on utilities, infrastructure, or transportation systems. NAVSTA Norfolk has the largest supported population of any naval installation, and current waterfront facilities are at capacity (Navy 2011n). If the NAVSTA Norfolk Alternative is implemented, then the number of vessels homeported in 2020 would be approximately the same as 2010 levels. Cumulatively, other decreases in homeported vessels as a result of decommissionings and strategic shifts could lessen the effects that homeporting LCSs would have at NAVSTA Norfolk, though effects on transportation systems, parking, and berthing could still occur because those systems are currently heavily used. By 2020, NAVSTA Norfolk is expected to experience a decrease in stationed personnel, when referenced against 2010 levels (see **Table 4-3**). Decreases in personnel could also decrease demand on infrastructure systems, such as the transportation network. When added to the effects from other activities, this alternative would not result in significant cumulative effects on utilities, infrastructure, or transportation systems.

MCAS Cherry Point

The Firescout program would be expected to have no effect on electrical supply, water supply, natural gas supply, the sanitary sewer, wastewater system, storm water drainage, liquid fuel supply, transportation and solid waste management at MCAS Cherry Point. The increase of 30 personnel, plus dependents,

would represent a slight increase in utility, infrastructure, and transportation systems and, therefore, would not contribute to cumulative effects. No significant cumulative effects would be expected.

4.1.2.9 Hazardous Materials and Wastes

NAVSTA Mayport Alternative

NAVSTA Mayport Scenario. This alternative scenario would not result in significant effects on hazardous materials and wastes. Construction-related activities would cumulatively result in increased use of hazardous materials and petroleum products and increased generation of hazardous wastes. However, these cumulative effects would not be significant. The removal of ACM, LBP, 8-RCRA metals, and PCBs during demolition activities would cumulatively reduce potential exposure to these materials. Cumulatively, NAVSTA Mayport is expected to experience an increase in homeported vessels, which would also increase hazardous materials and wastes associated with ships that are in port and on deployment. The additional volumes of hazardous materials and wastes generated would be minor and would not be expected to exceed the capacities of existing hazardous waste disposal facilities or management procedures. When added to the effects from other activities, this alternative scenario would not result in significant cumulative effects on hazardous materials and wastes.

NAVSTA Mayport-NSB Kings Bay Scenario. This alternative scenario would not result in significant effects on health and safety. Construction-related activities would cumulatively result in increased use of hazardous materials and petroleum products and increased generation of hazardous wastes. However, these cumulative effects would not be significant at NSB Kings Bay since only minor interior renovations would be expected. When added to the effects from other activities, this alternative scenario would not result in significant cumulative effects on hazardous materials and wastes at NSB Kings Bay.

Cumulative effects at NAVSTA Mayport under the NSB Kings Bay Scenario would be essentially the same as those described under the NAVSTA Mayport Scenario. No significant cumulative effects on hazardous materials and wastes at NAVSTA Mayport would be expected.

NAVSTA Norfolk Alternative

This alternative would not result in significant effects on hazardous materials and wastes. Construction-related activities would cumulatively result in increased use of hazardous materials and petroleum products and increased generation of hazardous wastes. However, these cumulative effects would not be significant. The removal of ACM, LBP, and PCBs during demolition activities would cumulatively reduce potential exposure to these materials. Cumulatively, the number of homeported vessels in 2020 is expected to be the same as 2010 levels, though the interim years could experience fluctuations. Changes in the volume of hazardous materials and wastes would be minor. When added to the effects from other activities, this alternative would not result in significant cumulative effects on hazardous materials and wastes.

MCAS Cherry Point

The Firescout program would require minimal quantities of certain hazardous materials during testing flights and maintenance. Additional helicopter training would also increase hazardous materials storage, use, and disposal. The types and quantities of hazardous materials used would be similar to what is already used for assigned aircraft and easily accommodated by existing management plans. No significant cumulative effects would be expected.

4.1.2.10 Cultural Resources

NAVSTA Mayport Alternative

NAVSTA Mayport Scenario. This alternative scenario would be expected to have no effect on archaeological or historical resources at NAVSTA Mayport, and, therefore, would not contribute to cumulative effects on cultural resources. No significant cumulative effects would be expected.

NAVSTA Mayport-NSB Kings Bay Scenario. This alternative scenario would be expected to have no effect on archaeological or historical resources at NAVSTA Mayport or NSB Kings Bay, and, therefore, would not contribute to cumulative effects on cultural resources. No significant cumulative effects would be expected.

NAVSTA Norfolk Alternative

This alternative would not result in significant effects on historic and cultural resources at NAVSTA Norfolk. The Proposed Action is located to the south of the NRHP-eligible Naval Supply Depot Historic District at NAVSTA Norfolk and will largely be obscured from view by existing non-historic warehouses. Consultation with the SHPO would be undertaken prior to construction activities to minimize potential indirect visual effects. When added to the effects from other activities, this alternative would not be expected to result in significant cumulative effects on cultural resources.

MCAS Cherry Point

The Firescout program would be expected to have no effect on archaeological or historical resources at MCAS Cherry Point, and, therefore, would not contribute to cumulative effects on cultural resources. No significant cumulative effects would be expected.

4.2 Compatibility of Alternatives with the Objectives of Federal, Regional, State, and Local Land Use Plans, Policies, and Controls

No potential conflicts are anticipated between the NAVSTA Mayport Alternatives or the NAVSTA Norfolk Alternative and any of the installation master plans, policies, or controls that address and guide uses within NAVSTA Mayport, NSB Kings Bay, NAVTSA Norfolk, and MCAS Cherry Point. The NAVSTA Mayport Alternatives and NAVSTA Norfolk Alternative would occur on Federal property. Since ownership and management would remain under the authority of the Federal government under either alternative, county- or city-level plans or policies are not applicable. No off-installation land uses would be affected by implementation of the NAVSTA Mayport Alternatives or the NAVSTA Norfolk Alternative.

4.3 Relationship Between Short-Term Uses of Man's Environment and Maintenance and Enhancement of Long-Term Productivity

NEPA requires consideration of the relationship between short-term use of the environment and the impacts that such use could have on the maintenance and enhancement of long-term productivity of the affected environment. Impacts that narrow the range of beneficial uses of the environment are of particular concern. Such impacts include the possibility that choosing one alternative could reduce future flexibility to pursue other alternatives, or that choosing a certain use could eliminate the possibility of other uses at the site. Short-term uses of the biophysical components of the human environment include

direct impacts, usually related to construction activities, which occur over a period of less than 5 years. Long-term uses of the human environment include those impacts that occur over a period of more than 5 years, including permanent resource loss.

Since minimal construction activity would occur, the NAVSTA Mayport Alternatives or the NAVSTA Norfolk Alternative would be expected to result in short-term effects; however, these effects would not be considered significant. Implementation of either alternative would result in considerable long-term military productivity by allowing the Navy to provide safety, security, and defense against foreign threats in littoral regions.

4.4 Irreversible and Irretrievable Commitment of Resources

NEPA (42 U.S.C. 4332 Section 102[2][C][v]) as implemented by CEQ regulation 40 CFR 1502.16 requires an analysis of significant, irreversible effects resulting from implementation of a proposed action. An irreversible or irretrievable commitment of resources refers to impacts on or losses to resources that cannot be reversed or recovered, even after an activity has ended. Resources that are irreversibly or irretrievably committed to a project are those that are typically used on a long-term or permanent basis; however, those used on a short-term basis that cannot be recovered (e.g., non-renewable resources such as metal, wood, fuel, paper, and other natural or cultural resources) also are irretrievable. Human labor is also considered an irretrievable resource. All such resources are irretrievable in that they are used for a project and, thus, become unavailable for other purposes.

An impact that falls under the category of the irreversible or irretrievable commitment of resources is the destruction of natural resources that could limit the range of potential uses of that resource. Implementation of the NAVSTA Mayport Alternatives or the NAVSTA Norfolk Alternative would result in an irreversible commitment of building materials; vehicles and equipment used during construction, renovation, or demolition activities; and human labor and other resources. Energy (i.e., electricity and natural gas), water, and fuel consumption; and demand for services would not increase significantly as a result of the implementation of either alternative. Operation of LCSs at NAVSTA Mayport or NAVSTA Norfolk would use energy resources by burning fossil fuels. Overall, consumption of energy resources would not place a significant demand on their availability in the region. The commitment of these resources is undertaken in a regular and authorized manner and does not represent a significant impact.

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APPENDIX A

PUBLIC AND AGENCY INVOLVEMENT MATERIALS

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Page 1 of 2

Affidavit of Publication
New Bern Sun Journal
New Bern, NC

Personally appeared before me, a Notary Public of the County of Craven State of North Carolina, on this the 3rd day of March, 2013

of The Sun Journal, who being duly sworn, states that the advertisement entitled **NOTICE OF AVAILABILITY OF A DRAFT ENVIRONMENTAL ASSESSMENT FOR THE HOMEPORTING OF THE LITTORAL COMBAT SHIP ON THE EAST COAST OF THE UNITED STATES The Department of the Navy (Navy) gives notice, per the National Environmental Policy Act of 1969, Cou** a true copy of which is printed herewith, appeared in The Sun Journal, a newspaper published in the City of New Bern, NC, County of Craven, State of North Carolina, 3 day a week for 1 weeks on the following dates:

March 1, 2013
March 2, 2013
March 3, 2013

NORTH CAROLINA
CRAVEN COUNTY

NOTICE OF AVAILABILITY OF A
DRAFT ENVIRONMENTAL ASSESSMENT
FOR THE HOMEPORTING OF THE LITTORAL COMBAT SHIP
ON THE EAST COAST OF THE UNITED STATES

The Department of the Navy (Navy) gives notice, per the National Environmental Policy Act of 1969, Council on Environmental Quality Regulations in 40 Code of Federal Regulations (CFR) Parts 1500-1508, and Navy NEPA regulations 32 CFR Part 775, that a Draft Environmental Assessment (EA) has been prepared for the proposed homeporting of the Littoral Combat Ship (LCS) on the East Coast of the United States. This Draft EA will be available for public review and comment for 30 days closing on March 29, 2013.

The EA evaluates the potential environmental effects of homeporting 14 LCSs at eitherNaval Station Norfolk, VA, or 14 LCSs at Naval Station Mayport, FL. Although no final decision has yet been made, the Navy's preferred alternative is to homeport the initial East Coast Littoral Combat Ships at Naval Station Mayport. The Draft EA includes an evaluation of the environmental effects of construction of support facilities at the chosen location and accommodating the required crews and unmanned aerial systems for the LCS. For example, MQ?8B Fire Scouts are proposed to be stored and flight tested at Marine Corps Air Station Cherry Point, NC.

The Draft EA is available for public review and comment at the following website:
https://portal.navfac.navy.mil/portal/page/portal/navfac/navfac_ww_pp/navfac_navfacmidlant_pp/midlant_ps/environmental_norfolk/tab3987837

Paper copies of the Draft EA are available for review at the following libraries:
òBeaches Branch Library, 600 3rd St., Neptune Beach, FL 32266
òJacksonville Main Library, 303 N Laura St. Jacksonville, FL 32202
òSt. Marys Public Library, 100 Herb Bauer Drive, St. Marys GA 31558
òHavelock-Craven County Public Library, 301 Cunningham Blvd., Havelock, NC 28532
òMary D. Pretlow Anchor Library, 111 W. Ocean View Ave., Norfolk VA 23503
òMeyera Oberndorf Central Library, 4100 Virginia Beach Blvd., Virginia Beach, VA 23452

Affidavit of Publication
New Bern Sun Journal
New Bern, NC

Comments may be submitted in writing to: LCS Homeporting EA Project Manager; Naval Facilities Engineering Command Atlantic; Attn: Code EV21/SS 6506 Hampton Blvd. Norfolk, VA 23508 or via e-mail using the following address: navfaclantpao@navy.mil. Comments must be postmarked no later than March 29, 2012. Comments should be as specific as possible.

March 1, 2, 3, 2013 (adv)

Subscribed and sworn to this 3rd day of March, 2013

X Tisha Williams
Notary Public

TISHA WILLIAMS
Notary Public
Onslow County
My Commission Expires
08/05/2017
NORTH CAROLINA

THE FLORIDA TIMES-UNION
Jacksonville, FL
Affidavit of Publication

Florida Times-Union

HDR ENVIRONMENTAL OPERATIONS
2600 PARK TOWER DR. STE 100
VIENNA VA 22180

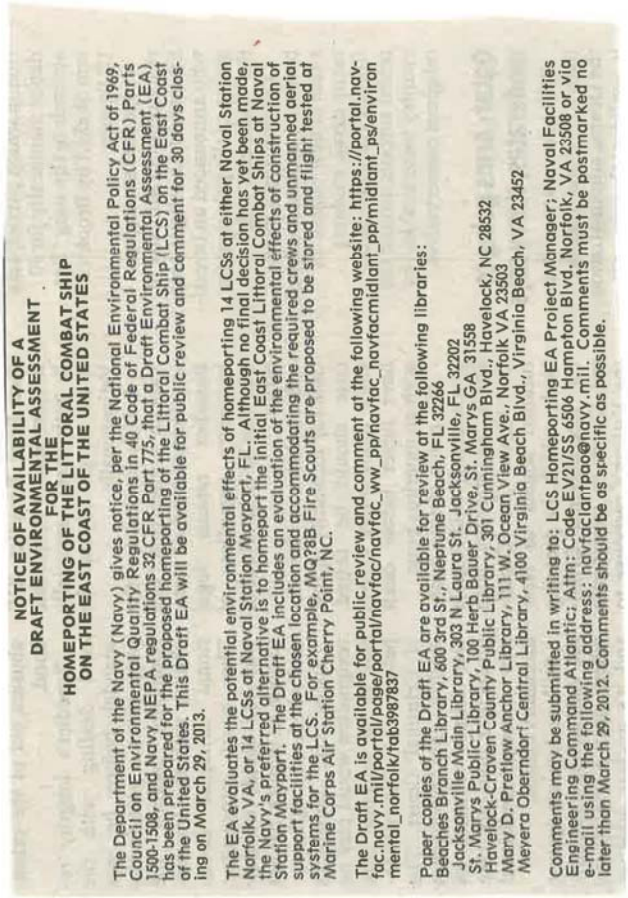
Reference: 1000628880
Ad Number: C14796105

State of Florida
County of Duval

Before the undersigned authority personally appeared Sharon Walker who on oath says he/she is a Legal Advertising Representative of The Florida Times-Union, a daily newspaper published in Duval County, Florida; that the attached copy of advertisement is a legal ad published in The Florida Times-Union. Affiant further says that The Florida Times-Union is a newspaper published in Duval County, Florida, and that the newspaper has heretofore been continuously published in Duval County, Florida each day, has been entered as second class mail matter at the post office in Jacksonville, in Duval County, Florida for a period of one year preceding the first publication of the attached copy of advertisement; and affiant further says that he/she has neither paid nor promised any person, firm or corporation any discount, rebate, commission, or refund for the purpose of securing this advertisement for publication in said newspaper.

PUBLISHED ON: 03/06/2013
03/07/2013
03/08/2013
03/10/2013

FILED ON: 03/06/2013



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Meyera Oberndorf Central Library, 4100 Virginia Beach Blvd., Virginia Beach, VA 23452

Comments may be submitted in writing to: LCS Homeporting EA Project Manager; Naval Facilities Engineering Command Atlantic; Attn: Code EV21/SS 6506 Hampton Blvd. Norfolk, VA 23508 or via e-mail using the following address: navfaclantpao@navy.mil. Comments must be postmarked no later than March 29, 2012. Comments should be as specific as possible.

Name: Sharon Walker Title: Legal Advertising Representative
In testimony whereof, I have hereunto set my hand and affixed my official Seal, the day and year aforesaid.

NOTARY: Sally W. Willis

SALLY W. WILLIS
Commission # DD 934386
Expires January 30, 2014
Bonded Thru Troy Fain Insurance 800-385-7019

MORE NEWS, 12A

NOTICE OF AVAILABILITY OF A DRAFT ENVIRONMENTAL ASSESSMENT FOR THE HOMEPORTING OF THE LITTORAL COMBAT SHIP ON THE EAST COAST OF THE UNITED STATES

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The NOA was published in the Brunswick News on Friday, March 1, 2013; Saturday, March 2, 2013; and Monday, March 4, 2013.

THE VIRGINIAN-PILOT
NORFOLK, VIRGINIA
AFFIDAVIT OF PUBLICATION

The Virginian-Pilot

HDR EOC
9563 SOUTH KINGSTON CT
SUITE 200, DIANN KEA
ENGLEWOOD CO 80112

REFERENCE: AA413776
23473323 LITTORAL COMBAT SHIP

State of Virginia
City of Norfolk

This day, Jacqueline Whitfield appeared before me and, after being duly sworn, made oath that: 1) she is affidavit clerk of the Virginian-Pilot, a newspaper published by The Virginian-Pilot Media Companies, LLC, in the cities of Norfolk, Portsmouth, Chesapeake, Suffolk, and Virginia Beach, Commonwealth of Virginia and in the state of North Carolina 2.) That the advertisement hereto annexed has been published in said newspaper on the dates stated

PUBLISHED ON: 03/01 03/02 03/03

TOTAL COST: 4,812.75 AD SPACE: 207 LINE
FILED ON: 03/08/13

Legal Affiant Jacqueline Whitfield

Subscribed and sworn to before me in my city and state on the day and year aforesaid this 12 of March in the year of 2013. (NRN:7145124)

Notary: [signature] My commission expires October 31, 2015.

NOTICE OF AVAILABILITY OF A DRAFT ENVIRONMENTAL ASSESSMENT FOR THE HOMEPORTING OF THE LITTORAL COMBAT SHIP ON THE EAST COAST OF THE UNITED STATES

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VP March 1, 2 & 3, 2013 23473323

Comment Response Matrix *Public Draft Environmental Assessment Addressing the Homeporting of the Littoral Combat Ship on the East Coast of the U.S.*						
#	Location			Comment	Reviewer	Response
	Page	Line	Section			
1	2-5	22	2.2	Alternatives are not ways to implement a Proposed Action; more correctly, they are ways of implementing a Proposal. According to 40 CFR 1500.2(e), the NEPA process is "to identify and assess the reasonable alternatives to proposed actions that will avoid or minimize the adverse effects of these actions..." What you call the Proposed Action is really the Proposal - the goal, or idea (40 CFR 1508.23). The Proposed action is more appropriately described as a fully developed plan of action to implement the Proposal, and is to be included with the alternatives in a comparative analysis. In other words, the comparative analysis is between the proposed action and the alternatives to that action. The individual alternatives should be developed to specifically avoid or minimize any adverse impacts described in the proposed action. In addition, throughout the CFR regs are cites that alternatives are "to the proposed action" (see 1500.2 above for one example); nowhere do you find a cite stating alternatives are "of the proposed action". Alternatives are not subsets of the proposed action, but are in opposition to it. What you (and most other agencies) commonly do is develop different operational alternatives as subsets of the proposed action and compare the impacts that way. Your focus is wrong. While any alternative must meet the stated P&N, alternative development should be driven first by resource impacts, then by operational concerns. If an alternative that reduces impacts does not meet the P&N, then it is not a reasonable one and can be discarded (though there are exceptions as not every alternative needs to meet every objective of the P&N). However, if it does meet the P&N, it should at least be considered for evaluation in the EA (or EIS). By running alternatives through resource impacts first, and operational concerns second, you are focusing more on doing an environmental analysis vice an operational one, which is the case when alternatives are first based on operations. This change in focus also helps avoid the development of ghost alternatives, a common problem in many NEPA actions. And it helps one to stay away from appearing pre-decisional, which often occurs when alternatives are developed based on operational decision making criteria, not environmental analysis criteria. This does not imply an EA/EIS shouldn't have alternatives that predominantly compare different operational programs (carrier vs. cruiser group at Mayport a few years ago), but let the operational alternatives be real and not just made up for the sake of NEPA just to show people you looked at different alternatives that have different resource impacts. How realistic are your different scenarios for each location under consideration? To be honest, they do look a little made-up, possibly just for the benefit of NEPA?	BR	Alternatives to the Proposed Action must meet the Purpose and Need and therefore, of necessity, are based on operational decision making criteria. Two alternatives (NAVSTA Mayport Alternative [Alternative 1] and NAVSTA Norfolk Alternative [Alternative 2]) were considered reasonable alternatives and are carried forward for detailed analysis in the EA because they were based on homeporting criteria (including operational and facility criteria). Therefore, no changes are required in the document.

Comment Response Matrix *Public Draft Environmental Assessment Addressing the Homeporting of the Littoral Combat Ship on the East Coast of the U.S.*						
#	Location			Comment	Reviewer	Response
	Page	Line	Section			
2			3.6	Another point is in regard to analysis of T&E species. You seem to just wash away any impacts on manatees essentially saying there wouldn't be any, yet you provide no comparison of frequency or timing of new missions compared to existing. I would think an increase in the amount of movements, if there is any, would create more likelihood of incidents with manatees, and could have a profound effect on cumulative impacts, which analysis is also missing. The same for other marine mammals and endangered species, such as whales and sea turtles, but there is no mention of any of this. Why not? You throw out a bunch of data but seem to do little real comparison, but that may be hard to do when you start looking out towards 2020 and beyond. Do the documents cited in Section 3.6.3 cover number and timing of LCS missions (these docs are not available to me)?	BR	LCS training and transits in and out of port are addressed in the *Atlantic Fleet Training and Testing EIS*. Therefore, no changes are required.
3			3.8	15+ pages of stuff on Socioecon and no real reason for that much detail. The EO only says to analyze EJ if there would be substantial impacts. I fail to see why that couldn't have been written off like a lot of the T&E stuff, "no substantial impact and won't be analyzed". Info in Sections 3.8.1 and 3.8.3 should be all that's needed, get rid of all that other data as it doesn't really pertain to any decisions being made.	BR	Socioeconomics was discussed in detail because of the increase in personnel and family members associated with the Proposed Action. Therefore, no changes are required.
4			4	Throughout the EA, you state there will be no significant impacts on a given resource, but I've seen no quantitative data stating just what a significant impact is. How do you know you've breached that level if you haven't defined it with some sort of number?	BR	Significance and impacts were evaluated for both context and intensity in accordance with 40CFR 1508.27. Therefore, no changes are required.

Comment Response Matrix *Public Draft Environmental Assessment Addressing the Homeporting of the Littoral Combat Ship on the East Coast of the U.S.*						
#	Location			Comment	Reviewer	Response
	Page	Line	Section			
5			General	Last, as a friendly note, it would be nice if the Navy would make their e-copies available with a hyperlinked Table of Contents, and even hyperlink references to various sections within the doc. This is typically done through special formatting in MS Word, which then carries over as Bookmarks (in outline format) and internal hyperlinks when converted to PDF. This dramatically facilitates an e-review, making it much easier and quicker to do - this system was used in the past with some EAs and EISs the Navy did, but was never very widespread for whatever reason. It does take a little extra effort to set up, but is well worth it once done.	BR	The Final EA will include bookmarks in the electronic (.pdf) version that is made available to the public.
6				The Environmental Assessment of the impacts of Homeporting 14 Navy LCS ships in Norfolk or Mayport is of great interest to the citizens of Norfolk area, as well as local governments and environmental groups. It is requested that a well-publicized presentation and hearing on this Draft EA be held in the Norfolk area at the earliest possible date. Please reply to this letter and indicate your intentions about a presentation/hearing on this matter.	RD	Public Outreach is described in Section 1.4. Because there is no substantial environmental controversy concerning the Proposed Action and no request by another agency with jurisdiction over the action, no public hearings will be conducted., per 40 CFR 1506.6.

Reviewers:

- *BR – Bob Riley*
- *RD – Robert F. Deegan*

Robert F. Deegan
301 Brooke Avenue
Apt. 204
Norfolk, VA 23510

3-6-2013

To: LCS Homeporting EA Project Manager

Subject: Draft EA

The Environmental Assessment of the impacts of homeporting 14 Navy LCS ships in Norfolk or Mayport is of great interest to the citizens of the Norfolk area, as well as local governments and environmental groups.

It is requested that a well-publicized presentation and hearing on this Draft EA be held in the Norfolk area at the earliest feasible date.

Please reply to this letter and indicate your intentions about a presentation/hearing on this matter.

Yours respectfully,
Robert F. Deegan

Robert F. Deegan
301 Brooke Avenue
Apt. 204
Norfolk, VA 23510

-----Original Message-----
From: Bob Riley [mailto:rileyrl99@yahoo.com]
Sent: Monday, March 18, 2013 2:49 PM
To: Brantley, James E CIV NAVFAC LANT, PAO
Subject: Re: Draft EA for Homeporting the Littoral Combat Ship on the East Coast

Thanks, got it. As a friendly note, after a quick look-see, it would be nice if the Navy would make their e-copies available with a hyperlinked Table of Contents, and even hyperlink references to various sections within the doc. This is typically done through special formatting in MS Word, which then carries over as Bookmarks (in outline format) and internal hyperlinks when converted to PDF. This dramatically facilitates an e-review, making it much easier and quicker to do - this system was used in the past with some EAs and EISs the Navy did, but was never very widespread for whatever reason (it does take a little extra effort to set up, but is well worth it once done).

Hope to have some pertinent comments by the end of the month.

Bob Riley

From: "Brantley, James E CIV NAVFAC LANT, PAO" <james.brantley@navy.mil>
To: Bob Riley <rileyrl99@yahoo.com>
Sent: Thursday, March 14, 2013 2:16 PM
Subject: RE: Draft EA for Homeporting the Littoral Combat Ship on the East Coast

Mr. Riley,

Attached is the document you requested; The Draft Environmental Assessment Addressing the Homeporting of the Littoral Combat Ship on the East Coast of the United States. Thank you for your interest.

LCS EA Project Manager

From: Bob Riley [mailto:rileyrl99@yahoo.com]
Posted At: Wednesday, March 13, 2013 3:16 PM
Posted To: PAO COMMENTS
Conversation: Draft EA for Homeporting the Littoral Combat Ship on the East Coast
Subject: Draft EA for Homeporting the Littoral Combat Ship on the East Coast

Hello - I saw the notice in the local newspaper here in Jacksonville, FL but was unable to access the website provided. It has a very long URL with a security https to boot. I use the computer at my local library as I don't have one at home and for some reason it won't allow me to access your website. Since the nearest library with a copy is in downtown Jax, which is about a 1-hour drive for me, can you simply email me a pdf of the DEA and appendices?

Thanks,
Bob Riley

-----Original Message-----
From: Bob Riley [mailto:rileyrl99@yahoo.com]
Sent: Friday, March 29, 2013 3:45 PM
To: Brantley, James E CIV NAVFAC LANT, PAO
Subject: Re: Draft EA for Homeporting the Littoral Combat Ship on the East Coast

Hello - This letter is in response to the DEA for homeporting the LCS on the east coast. My comments are few and pertain more to general NEPA issues.

1) Page 2-5, Line 22

Alternatives are not ways to implement a Proposed Action; more correctly, they are ways of implementing a Proposal. According to 40 CFR 1500.2(e), the NEPA process is "to identify and assess the reasonable alternatives to proposed actions that will avoid or minimize the adverse effects of these actions...". What you call the Proposed Action is really the Proposal - the goal, or idea (40 CFR 1508.23). The Proposed action is more appropriately described as a fully developed plan of action to implement the Proposal, and is to be included with the alternatives in a comparative analysis. In other words, the comparative analysis is between the proposed action and the alternatives to that action. The individual alternatives should be developed to specifically avoid or minimize any adverse impacts described in the proposed action. In addition, throughout the CFR regs are cites that alternatives are "to the proposed action" (see 1500.2 above for one example); nowhere do you fin
d a cite stating alternatives are "of the proposed action". Alternatives are not subsets of the proposed action, but are in opposition to it.

What you (and most other agencies) commonly do is develop different operational alternatives as subsets of the proposed action and compare the impacts that way. Your focus is wrong. While any alternative must meet the stated P&N, alternative development should be driven first by resource impacts, then by operational concerns. If an alternative that reduces impacts does not meet the P&N, then it is not a reasonable one and can be discarded (though

there are exeptions as not every alternative needs to meet every objective of the P&N). However, if it does meet the P&N, it should at least be considered for evaluation in the EA (or EIS). By running alternatives through resource impacts first, and operational concerns second, you are focusing more on doing an environmental analysis vice an operational one, which is the case when alternatives are first based on operations. This change in focus also helps avoid the development of ghost alternatives, a common problem in many NEP
A actions. And it helps one to stay away from appearing pre-decisional, which often occurs when alternatives are developed based on operational decision making criteria, not environmental analysis criteria. This does not imply an EA/EIS shouldn't have alternatives that predominantly compare different operational programs (carrier vs. cruiser group at Mayport a few years ago), but let the operational alternatives be real and not just made up for the sake of NEPA just to show people you looked at different alternatives that have different resource impacts. How realistic are your different scenarios for each location under consideration? To be honest, they do look a little made-up, possibly just for the benefit of NEPA?

2) Section 3.6

Another point is in regard to analysis of T&E species. You seem to just wash away any impacts on manatees essentially saying there wouldn't be any, yet you provide no comparison of frequency or timing of new missions compared to existing. I would think an increase in the amount of movements, if there is any, would create more likelihood of incidents with manatees, and could have a profound effect on cumulative impacts, which analysis is also missing. The same for other marine mammals and endangered species, such as whales and sea turtles, but there is no mention of any of this. Why not? You throw out a bunch of data but seem to do little real comparison, but that may be hard to do when you start looking out towards 2020 and beyond. Do the documents cited in Section 3.6.3 cover number and timing of LCS missions (these docs are not available to me)?

3) Section 3.8

15+ pages of stuff on Socioecon and no real reason for that much detail. The EO only says to analyze EJ if there would be substantial impacts. I fail to see why that couldn't have been written off like a lot of the T&E stuff, "no substantial impact and won't be analyzed". Info in Sections 3.8.1 and 3.8.3 should be all that's needed, get rid of all that other data as it doesn't really pertain to any decisions being made.

4) Environ. Conseq.

Throughout the EA, you state there will be no significant impacts on a given resource, but I've seen no quantitative data stating just what a significant impact is. How do you know you've breached that level if you haven't defined it with some sort of number?

5) Misc.
Last, as a friendly note, it would be nice if the Navy would make their e-copies available with a hyperlinked Table of Contents, and even hyperlink references to various sections within the doc. This is typically done through special formatting in MS Word, which then carries over as Bookmarks (in outline format) and internal hyperlinks when converted to PDF. This dramatically facilitates an e-review, making it much easier and quicker to do - this system was used in the past with some EAs and EISs the Navy did, but was never very widespread for whatever reason. It does take a little extra effort to set up, but is well worth it once done.

My 2 cents worth. Thanks for the opportunity to respond.

Bob Riley

APPENDIX B

AIR EMISSIONS CALCULATIONS

Summary	Summarizes total emissions by calendar year for Construction of the LCS Support Facility at NAVSTA Mayport
Combustion	Estimates emissions from non-road equipment exhaust.
Fugitive	Estimates particulate emissions from construction and demolition activities including earthmoving, vehicle traffic, and windblown dust.
Grading	Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions.
Haul Truck On-Road	Estimates emissions from haul trucks hauling fill materials to the job site.
Construction Commuter	Estimates emissions for construction workers commuting to the site.
Emergency Generator	Estimates emissions from the operation of emergency generators.
AQCR Tier Report	Summarizes total emissions for the Jackson-Brunswick Interstate Air Quality Control Region Tier report for 2008, to be used to compare construction of the LCS Support Facility at NAVSTA Mayport to regional emissions.

Jacksonville-Brunswick Interstate Air Quality Control Region

			All Emission Sources					
Row #	State	County	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC
1	FL	Alachua, Baker, Bradford, Clay, Columbia, Dixie, Duval, Flagler, Franklin, Gadsden, Gilchrist, Hamilton, Jefferson, Lafayette, Leon, Liberty, Madison, Marion, Nassau, Putnam, St. Johns, Suwannee, Taylor, Union, Wakulla	554,530	139,775	101,595	41,336	61,777	533,283
2	GA	Appling, Atkinson, Bacon, Brantley, Camden, Charlton, Cling, Coffee, Glynn, Long, McIntosh, Pierce, Ware, Wayne	115,275	20,546	41,949	9,861	2,054	197,739
Grand Total			669,805	160,320	143,545	51,197	63,831	731,022

SOURCE:
http://neibrowser.epa.gov/eis-public-web/home.html

Air Emissions for Construction of the LCS Support Facility at NAVSTA Mayport

	NO_x (ton)	VOC (ton)	CO (ton)	SO_2 (ton)	PM_{10} (ton)	$PM_{2.5}$ (ton)	CO_2 (ton)
Combustion	5.075	0.609	2.227	0.403	0.362	0.351	577.683
Fugitive Dust	-	-	-	-	7.177	0.718	-
Haul Truck On-Road	0.774	0.560	2.275	0.061	0.921	0.239	196.024
Commuter	0.099	0.099	0.892	0.001	0.009	0.006	118.334
TOTAL	***5.949***	***1.267***	***5.395***	***0.465***	***8.469***	***1.314***	***892.041***

Note: Total $PM_{10}/_{2.5}$ fugitive dust emissions are assuming USEPA 50% control efficiencies.

CO_2 emissions converted to metric tons =	***809.081***	***metric tons***	
State of Florida's CO_2 emissions =	***227,000,000***	***metric tons***	*(U.S. DOE/EIA 2011)*
Percent of Florida's CO_2 emissions =	***0.00036%***		
United States' CO_2 emissions =	***5,425,600,000***	***metric tons***	*(U.S. DOE/EIA 2011)*
Percent of USA's CO_2 emissions =	***0.000015%***		

Source: U.S. Department of Energy, Energy Information Administration (U.S. DOE/EIA). 2012. *Table 1. State Emissions by Year (Million Metric Tons of Carbon Dioxide).* Available online <http://www.eia.gov/environment/emissions/state/state_emissions.cfm>. Data released October 2011. Data accessed 30 July 2012.

Since future year budgets were not readily available, actual 2008 air emissions inventories for the counties were used as an approximation of the regional inventory. Because Mayport Construction Activities (Scenario 1) is several orders of magnitude below significance, the conclusion would be the same, regardless of whether future year budget data set were used.

Jackson-Brunswick Interstate Air Quality Control Region

	Point and Area Sources Combined					
Year	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
2008	160,320	731,022	669,805	63,831	143,545	51,197

Source: USEPA National Emissions Inventory (NEI) (http://neibrowser.epa.gov/eis-public-web/home.html). Site visited on 30 July 2012

Air Emissions from Construction of the LCS Support Facility at NAVSTA Mayport

	Point and Area Sources Combined					
	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Regional Emissions	160,320	731,022	669,805	63,831	143,545	51,197
Emissions	5.949	1.267	5.395	0.465	8.469	1.314
% of Regional	**0.004%**	**0.0002%**	**0.001%**	**0.001%**	**0.006%**	**0.003%**

Combustion Emissions

Combustion Emissions of VOC, NO_x, SO_2, CO, $PM_{2.5}$, $PM_{10,}$ and CO_2 due to Construction and Demolition

	General Construction and Demolition Activities	Area Disturbed
1.)	Construct LCS Support Facility @ NAVSTA Mayport	67,075 ft²
2.)	Construct Parking for LCS Support Facility @ NAVSTA Mayport	93,712 ft²

Total Construction Area:	67,075	ft²	Line 1
	1.54	acres	
Total Demolition Area:	0	ft²	
	0.00	acres	
Total Pavement Area:	93,712	ft²	Line 2
	2.15	acres	
Total Disturbed Area:	160,787	ft²	Line 1 and Line 2
	3.69	acres	
Construction Duration:	12	months	
Annual Construction Activity:	240	days	Assume 4 weeks per month, 5 days per week.

Emission Factors Used for Construction Equipment

References: Guide to Air Quality Assessment, SMAQMD, 2004; and U.S. EPA NONROAD Emissions Model, Version 2005.0.0
Emission factors are taken from the NONROAD model and were provided to e²M by Larry Landman of the Air Quality and Modeling Center (Landman.Larry@epamail.epa.gov) on 12/14/07. Factors provided are for the weighted average US fleet for CY2007.
Assumptions regarding the type and number of equipment are from SMAQMD Table 3-1 unless otherwise noted.

Grading

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Bulldozer	1	13.60	0.96	5.50	1.02	0.89	0.87	1456.90
Motor Grader	1	9.69	0.73	3.20	0.80	0.66	0.64	1141.65
Water Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Total per 10 acres of activity	3	41.64	2.58	15.71	3.45	2.55	2.47	4941.53

Paving

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Paver	1	3.83	0.37	2.06	0.28	0.35	0.34	401.93
Roller	1	4.82	0.44	2.51	0.37	0.43	0.42	536.07
Truck	2	36.71	1.79	14.01	3.27	1.99	1.93	4685.95
Total per 10 acres of activity	4	45.37	2.61	18.58	3.93	2.78	2.69	5623.96

Demolition

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Loader	1	13.45	0.99	5.58	0.95	0.93	0.90	1360.10
Haul Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Total per 10 acres of activity	2	31.81	1.89	12.58	2.58	1.92	1.87	3703.07

Building Construction

Equipment[d]	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Stationary								
Generator Set	1	2.38	0.32	1.18	0.15	0.23	0.22	213.06
Industrial Saw	1	2.62	0.32	1.97	0.20	0.32	0.31	291.92
Welder	1	1.12	0.38	1.50	0.08	0.23	0.22	112.39
Mobile (non-road)								
Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Forklift	1	5.34	0.56	3.33	0.40	0.55	0.54	572.24
Crane	1	9.57	0.66	2.39	0.65	0.50	0.49	931.93
Total per 10 acres of activity	6	39.40	3.13	17.38	3.12	2.83	2.74	4464.51

Note: Footnotes for tables are on following page

Architectural Coatings

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Air Compressor	1	3.57	0.37	1.57	0.25	0.31	0.30	359.77
Total per 10 acres of activity	1	3.57	0.37	1.57	0.25	0.31	0.30	359.77

a) The SMAQMD 2004 guidance suggests a default equipment fleet for each activity, assuming 10 acres of that activity, (e.g., 10 acres of grading, 10 acres of paving, etc.). The default equipment fleet is increased for each 10 acre increment in the size of the construction project. That is, a 26 acre project would round to 30 acres and the fleet size would be three times the default fleet for a 10 acre project.

b) The SMAQMD 2004 reference lists emission factors for reactive organic gas (ROG). For the purposes of this worksheet ROG = VOC. The NONROAD model contains emissions factors for total HC and for VOC. The factors used here are the VOC factors.

c) The NONROAD emission factors assume that the average fuel burned in nonroad trucks is 1100 ppm sulfur. Trucks that would be used for the Proposed Actions will all be fueled by highway grade diesel fuel which cannot exceed 500 ppm sulfur. These estimates therefore over-estimate SO2 emissions by more than a factor of two.

d) Typical equipment fleet for building construction was not itemized in SMAQMD 2004 guidance. The equipment list above was assumed based on SMAQMD 1994 guidance.

PROJECT-SPECIFIC EMISSION FACTOR SUMMARY

Source	Equipment Multiplier*	Project-Specific Emission Factors (lb/day)						
		NO_x	VOC	CO	SO_2**	PM_{10}	$PM_{2.5}$	CO_2
Grading Equipment	1	41.641	2.577	15.710	3.449	2.546	2.469	4941.526
Paving Equipment	1	45.367	2.606	18.578	3.926	2.776	2.693	5623.957
Demolition Equipment	1	31.808	1.886	12.584	2.585	1.923	1.865	3703.074
Building Construction	1	39.396	3.130	17.382	3.116	2.829	2.744	4464.512
Air Compressor for Architectural Coating	1	3.574	0.373	1.565	0.251	0.309	0.300	359.773
Architectural Coating**			21.108					

*The equipment multiplier is an integer that represents units of 10 acres for purposes of estimating the number of equipment required for the project.

**Emission factor is from the evaporation of solvents during painting, per "Air Quality Thresholds of Significance", SMAQMD, 1994

Example: SMAQMD Emission Factor for Grading Equipment NOx = (Total Grading NOx per 10 acre)*(Equipment Multiplier)

Summary of Input Parameters

	Total Area (ft^2)	Total Area (acres)	Total Days	
Grading:	160,787	3.69	3	(from "Grading" worksheet)
Paving:	93,712	2.15	11	
Demolition:	0	0.00	0	
Building Construction:	67,075	1.54	240	
Architectural Coating	67,075	1.54	20	(per SMAQMD "Air Quality of Thresholds of Significance", 1994)

NOTE: The 'Total Days' estimate for paving is calculated by dividing the total number of acres by 0.21 acres/day, which is a factor derived from the 2005 MEANS Heavy Construction Cost Data, 19th Edition, for 'Asphaltic Concrete Pavement, Lots and Driveways - 6" stone base', which provides an estimate of square feet paved per day. There is also an estimate for 'Plain Cement Concrete Pavement', however the estimate for asphalt is used because it is more conservative. The 'Total 'Days' estimate for demolition is calculated by dividing the total number of acres by 0.02 acres/day, which is a factor also derived from the 2005 MEANS reference. This is calculated by averaging the demolition estimates from 'Building Demolition - Small Buildings, Concrete', assuming a height of 30 feet for a two-story building; from 'Building Footings and Foundations Demolition - 6" Thick, Plain Concrete'; and from 'Demolish, Remove Pavement and Curb - Concrete to 6" thick, rod reinforced'. Paving is double-weighted since projects typically involve more paving demolition. The 'Total Days' estimate for building construction is assumed to be 230 days, unless project-specific data is known.

Total Project Emissions by Activity (lbs)

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Grading Equipment	124.92	7.73	47.13	10.35	7.64	7.41	14,825
Paving	499.04	28.66	204.36	43.18	30.54	29.62	61,864
Demolition	-	-	-	-	-	-	0
Building Construction	9,455.12	751.15	4,171.75	747.92	678.97	658.60	1,071,483
Architectural Coatings	71.48	429.61	31.31	5.02	6.19	6.00	7,195
Total Emissions (lbs):	**10,150.56**	**1,217.16**	**4,454.56**	**806.48**	**723.33**	**701.63**	**1,155,366**

Results: Total Project Annual Emission Rates

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Total Project Emissions (lbs)	10,150.56	1,217.16	4,454.56	806.48	723.33	701.63	1,155,366
Total Project Emissions (tons)	5.075	0.609	2.227	0.403	0.362	0.351	577.683

Construction Fugitive Dust Emissions

Construction Fugitive Dust Emission Factors

	Emission Factor	Units	Source
Construction and Demolition Activities	0.19	ton PM_{10}/acre-month	MRI 1996; EPA 2001; EPA 2006
New Road Construction	0.42	ton PM_{10}/acre-month	MRI 1996; EPA 2001; EPA 2006

$PM_{2.5}$ Emissions

$PM_{2.5}$ Multiplier	0.10	(10% of PM_{10} emissions assumed to be $PM_{2.5}$)	EPA 2001; EPA 2006
Control Efficiency	0.50	(assume 50% control efficiency for PM_{10} and $PM_{2.5}$ emissions)	EPA 2001; EPA 2006

Project Assumptions

New Roadway Construction (0.42 ton PM_{10}/acre-month)

Duration of Construction Project	12	months
Area	2.15	acres

General Construction and Demolition Activities (0.19 ton PM_{10}/acre-month)

Duration of Project	12	months
Area	1.54	acres

	Project Emissions (tons/year)			
	PM_{10} uncontrolled	**PM_{10} controlled**	**$PM_{2.5}$ uncontrolled**	**$PM_{2.5}$ controlled**
New Roadway Construction	10.843	5.421	1.084	0.542
General Construction Activities	3.511	1.755	0.351	0.176
Total	**14.354**	**7.177**	**1.435**	**0.718**

Construction Fugitive Dust Emission Factors

General Construction Activities Emission Factor

0.19 ton PM_{10}/acre-month Source: MRI 1996; EPA 2001; EPA 2006

The area-based emission factor for construction activities is based on a study completed by the Midwest Research Institute (MRI) Improvement of Specific Emission Factors (BACM Project No. 1), March 29, 1996. The MRI study evaluated seven construction projects in Nevada and California (Las Vegas, Coachella Valley, South Coast Air Basin, and the San Joaquin Valley). The study determined an average emission factor of 0.11 ton PM_{10}/acre-month for sites without large-scale cut/fill operations. A worst-case emission factor of 0.42 ton PM_{10}/acre-month was calculated for sites with active large-scale earth moving operations. The monthly emission factors are based on 168 work-hours per month (MRI 1996). A subsequent MRI Report in 1999, Estimating Particulate Matter Emissions From Construction Operations, calculated the 0.19 ton PM_{10}/acre-month emission factor by applying 25% of the large-scale earthmoving emission factor (0.42 ton PM_{10}/acre-month) and 75% of the average emission factor (0.11 ton PM_{10}/acre-month). The 0.19 ton PM_{10}/acre-month emission factor is referenced by the EPA for non-residential construction activities in recent procedures documents for the National Emission Inventory (EPA 2001; EPA 2006). The 0.19 ton PM_{10}/acre-month emission factor represents a refinement of EPA's original AP-42 area-based total suspended particulate (TSP) emission factor in Section 13.2.3 Heavy Construction Operations. In addition to the EPA, this methodology is also supported by the South Coast Air Quality Management District as well as the Western Regional Air Partnership (WRAP) which is funded by the EPA and is administered jointly by the Western Governor's Association and the National Tribal Environmental Council. The emission factor is assumed to encompass a variety of non-residential construction activities including building construction (commercial, industrial, institutional, governmental), public works, and travel on unpaved roads. The EPA National Emission Inventory documentation assumes that the emission factors are uncontrolled and recommends a control efficiency of 50% for PM_{10} and $PM_{2.5}$ in PM nonattainment areas.

New Road Construction Emission Factor

0.42 ton PM_{10}/acre-month Source: MRI 1996; EPA 2001; EPA 2006

The emission factor for new road construction is based on the worst-case conditions emission factor from the MRI 1996 study described above (0.42 tons PM_{10}/acre-month). It is assumed that road construction involves extensive earthmoving and heavy construction vehicle travel resulting in emissions that are higher than other general construction projects. The 0.42 ton PM10/acre-month emission factor for road construction is referenced in recent procedures documents for the EPA National Emission Inventory (EPA 2001; EPA 2006).

$PM_{2.5}$ Multiplier **0.10**

$PM_{2.5}$ emissions are estimated by applying a particle size multiplier of 0.10 to PM_{10} emissions. This methodology is consistent with the procedures documents for the National Emission Inventory (EPA 2006).

Control Efficiency for PM_{10} and $PM_{2.5}$ **0.50**

The EPA National Emission Inventory documentation recommends a control efficiency of 50% for PM_{10} and $PM_{2.5}$ in PM nonattainment areas (EPA 2006). Wetting controls will be applied during project construction.

References:

EPA 2001. *Procedures Document for National Emissions Inventory, Criteria Air Pollutants, 1985-1999.* EPA-454/R-01-006. Office of Air Quality Planning and Standards, United States Environmental Protection Agency. March 2001.

EPA 2006. *Documentation for the Final 2002 Nonpoint Sector (Feb 06 version) National Emission Inventory for Criteria and Hazardous Air Pollutants.* Prepared for: Emissions Inventory and Analysis Group (C339-02) Air Quality Assessment Division Office of Air Quality Planning and Standards, United States Environmental Protection Agency. July 2006.

MRI 1996. *Improvement of Specific Emission Factors (BACM Project No. 1).* Midwest Research Institute (MRI). Prepared for the California South Coast Air Quality Management District, March 29, 1996.

Grading Schedule

Estimate of time required to grade a specified area.

Input Parameters

Construction area: 3.69 acres/yr (from Combustion Worksheet)

Qty Equipment: 3.00 (calculated based on 3 pieces of equipment for every 10 acres)

Assumptions.

Terrain is mostly flat.

An average of 6" soil is excavated from one half of the site and backfilled to the other half of the site; no soil is hauled off-site or borrowed.

200 hp bulldozers are used for site clearing.

300 hp bulldozers are used for stripping, excavation, and backfill.

Vibratory drum rollers are used for compacting.

Stripping, Excavation, Backfill and Compaction require an average of two passes each.

Excavation and Backfill are assumed to involve only half of the site.

Calculation of days required for one piece of equipment to grade the specified area.

Reference: Means Heavy Construction Cost Data, 19th Ed., R. S. Means, 2005.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day)	equip-days per acre	Acres/yr (project-specific)	Equip-days per year
2230 200 0550	Site Clearing	Dozer & rake, medium brush	8	acre/day	8	0.13	3.69	0.46
2230 500 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	3.69	1.80
2315 432 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.99	1.01	1.85	1.86
2315 120 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	1.85	0.76
2315 310 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	2,300	cu. yd/day	2.85	0.35	3.69	1.29
TOTAL								6.18

Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 6.18

Qty Equipment: 3.00

Grading days/yr: 2.06

Haul Truck Emissions

Emissions from hauling excavation material and construction supplies are estimated in this spreadsheet.
Emission Estimation Method: United States Air Force (USAF) Institute for Environment, Safety and Occupational Health Risk Analysis (IERA) Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations (Revised December 2003).

Assumptions:

Haul trucks carry 20 cubic yards of material per trip.
The average distance from the project site to the materials source is 15 miles; therefore, a haul truck will travel 30 miles round trip.
Estimated number of trips required by haul trucks = total amount of material/20 cubic yards per truck

Amount of Building Materials (Above Ground) =	29,811	cubic yards	Assumes 4 feet of building material are needed
Amount of Building Materials (Below Ground) =	12,421	cubic yards	Assumes 5 feet of material are needed for the below ground portion of the facility
Amount of Excavation Material =	29,811	cubic yards	Assumes 12 feet of material would need to be excavated on average
Number of trucks required =	3602	heavy duty diesel haul truck trips	
Miles per trip =	30	miles	

Heavy Duty Diesel Vehicle (HDDV) Average Emission Factors (grams/mile)

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
HDDV	**6.5**	**4.7**	**19.1**	**0.512**	**7.73**	**2.01**	**1645.605**

Notes:

Emission factors for all pollutants except CO_2 are from USAF IERA 2003.

Emission factors for PM, PM_{10}, SO_x are from HDDV in Table 4-50 (USAF IERA 2003).

Emission factors for VOC, CO, and NO_x are from Tables 4-41 through 4-43 for the 2010 calendar year, 2000 model year (USAF IERA 2003).

Diesel fuel produces 22.384 pounds of CO2 per gallon.

It is assumed that the average HDDV has a fuel economy of 6.17 miles per gallon, Table 4-51 (USAF IERA 2003)

CO_2 emission factor = 22.384 lbs CO_2/gallon diesel * gallon diesel/6.17 miles * 453.6 g/lb

HDDV Haul Truck Emissions

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
lbs	**1548.554**	**1119.724**	**4550.368**	**121.978**	**1841.589**	**478.861**	**392047.517**
tons	**0.774**	**0.560**	**2.275**	**0.061**	**0.921**	**0.239**	**196.024**

Example Calculation: NO_x emissions (lbs) = 30 miles per trip * 369 trips * NO_x emission factor (g/mile) * lb/453.6 g

Construction Commuter Emissions

Emissions from construction workers commuting to the job site are estimated in this spreadsheet.

Emission Estimation Method: Emission factors from the South Coast Air Quality Management District (SCAQMD) EMFAC 2007 (v 2.3) Model (on-road) were used. These emission factors are available online at http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.

Assumptions:
Passenger vehicle emission factors for scenario year 2010 are used.

The average roundtrip commute for a construction worker =	30	miles
Number of construction days =	240	days
Number of construction workers (daily) =	30	people

Passenger Vehicle Emission Factors for Year 2010 (lbs/mile)

NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
0.00091814	0.00091399	0.00826276	0.00001077	0.00008698	0.00005478	1.09568235

Source: South Coast Air Quality Management District. EMFAC 2007 (ver 2.3) On-Road Emissions Factors. Last updated April 24, 2008. Available online: <http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html>. Accessed 27 May 2009.
Notes:
The SMAQMD 2007 reference lists emission factors for reactive organic gas (ROG). For purposes of this worksheet ROG = VOC.

Construction Commuter Emissions

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
lbs	**198.318**	**197.421**	**1784.755**	**2.327**	**18.787**	**11.833**	**236667.387**
tons	**0.099**	**0.099**	**0.892**	**0.001**	**0.009**	**0.006**	**118.334**

Example Calculation: NO_x emissions (lbs) = 60 miles/day * NO_x emission factor (lb/mile) * number of construction days * number of workers

Summary	Summarizes total emissions by calendar year for Construction of the LCS Training Facility at NAVSTA Mayport
Combustion	Estimates emissions from non-road equipment exhaust.
Fugitive	Estimates particulate emissions from construction and demolition activities including earthmoving, vehicle traffic, and windblown dust.
Grading	Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions.
Haul Truck On-Road	Estimates emissions from haul trucks hauling fill materials to the job site.
Construction Commuter	Estimates emissions for construction workers commuting to the site.
Emergency Generator	Estimates emissions from the operation of emergency generators.
AQCR Tier Report	Summarizes total emissions for the Jackson-Brunswick Interstate Air Quality Control Region Tier report for 2008, to be used to compare construction of the LCS Training Facility at NAVSTA Mayport to regional emissions.

Jacksonville-Brunswick Interstate Air Quality Control Region

			All Emission Sources					
Row #	State	County	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC
1	FL	Alachua, Baker, Bradford, Clay, Columbia, Dixie, Duval, Flagler, Franklin, Gadsden, Gilchrist, Hamilton, Jefferson, Lafayette, Leon, Liberty, Madison, Marion, Nassau, Putnam, St. Johns, Suwannee, Taylor, Union, Wakulla	554,530	139,775	101,595	41,336	61,777	533,283
2	GA	Appling, Atkinson, Bacon, Brantley, Camden, Charlton, Cling, Coffee, Glynn, Long, McIntosh, Pierce, Ware, Wayne	115,275	20,546	41,949	9,861	2,054	197,739
Grand Total			669,805	160,320	143,545	51,197	63,831	731,022

SOURCE:
http://neibrowser.epa.gov/eis-public-web/home.html
USEPA National Emissions Inventory (NEI)
Emissions in tons per year for 2008

Air Emissions for Construction of the LCS Training Facility at NAVSTA Mayport

	NO_x (ton)	VOC (ton)	CO (ton)	SO_2 (ton)	PM_{10} (ton)	$PM_{2.5}$ (ton)	CO_2 (ton)
Combustion	4.805	0.647	2.117	0.380	0.345	0.335	544.281
Fugitive Dust	-	-	-	-	2.774	0.277	-
Haul Truck On-Road	1.224	0.885	3.596	0.096	1.455	0.378	309.780
Commuter	0.099	0.099	0.892	0.001	0.009	0.006	118.334
TOTAL	***6.128***	***1.631***	***6.605***	***0.477***	***4.584***	***0.996***	***972.395***

Note: Total $PM_{10}/_{2.5}$ fugitive dust emissions are assuming USEPA 50% control efficiencies.

CO_2 emissions converted to metric tons =	***881.962***	***metric tons***	
State of Florida's CO_2 emissions =	***227,000,000***	***metric tons***	*(U.S. DOE/EIA 2011)*
Percent of Florida's CO_2 emissions =	***0.00039%***		
United States' CO_2 emissions =	***5,425,600,000***	***metric tons***	*(U.S. DOE/EIA 2011)*
Percent of USA's CO_2 emissions =	***0.000016%***		

Source: U.S. Department of Energy, Energy Information Administration (U.S. DOE/EIA). 2012. *Table 1. State Emissions by Year (Million Metric Tons of Carbon Dioxide).* Available online <http://www.eia.gov/environment/emissions/state/state_emissions.cfm>. Data released October 2011. Data accessed 30 July 2012.

Since future year budgets were not readily available, actual 2008 air emissions inventories for the counties were used as an approximation of the regional inventory. Because Mayport Construction Activities (Scenario 1) is several orders of magnitude below significance, the conclusion would be the same, regardless of whether future year budget data set were used.

Jackson-Brunswick Interstate Air Quality Control Region

	Point and Area Sources Combined					
Year	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
2008	160,320	731,022	669,805	63,831	143,545	51,197

Source: USEPA National Emissions Inventory (NEI) (http://neibrowser.epa.gov/eis-public-web/home.html). Site visited on 30 July 2012

Air Emissions from Construction of the LCS Training Facility at NAVSTA Mayport

	Point and Area Sources Combined					
	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Regional Emissions	160,320	731,022	669,805	63,831	143,545	51,197
Emissions	6.128	1.631	6.605	0.477	4.584	0.996
% of Regional	**0.004%**	**0.0002%**	**0.001%**	**0.001%**	**0.003%**	**0.002%**

Combustion Emissions

Combustion Emissions of VOC, NO_x, SO_2, CO, $PM_{2.5}$, $PM_{10,}$ and CO_2 due to Construction and Demolition

	General Construction and Demolition Activities	**Area Disturbed**
1.)	Construct LCS Training Facility @ NAVSTA Mayport	106,000 ft²

Total Construction Area:	106,000	ft²	Line 1
	2.43	acres	
Total Demolition Area:	0	ft²	
	0.00	acres	
Total Pavement Area:	0	ft²	Line 2
	0.00	acres	
Total Disturbed Area:	106,000	ft²	Line 1 and Line 2
	2.43	acres	
Construction Duration:	12	months	
Annual Construction Activity:	240	days	Assume 4 weeks per month, 5 days per week.

Emission Factors Used for Construction Equipment

References: Guide to Air Quality Assessment, SMAQMD, 2004; and U.S. EPA NONROAD Emissions Model, Version 2005.0.0
Emission factors are taken from the NONROAD model and were provided to e²M by Larry Landman of the Air Quality and Modeling Center (Landman.Larry@epamail.epa.gov) on 12/14/07. Factors provided are for the weighted average US fleet for CY2007.
Assumptions regarding the type and number of equipment are from SMAQMD Table 3-1 unless otherwise noted.

Grading

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Bulldozer	1	13.60	0.96	5.50	1.02	0.89	0.87	1456.90
Motor Grader	1	9.69	0.73	3.20	0.80	0.66	0.64	1141.65
Water Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Total per 10 acres of activity	3	41.64	2.58	15.71	3.45	2.55	2.47	4941.53

Paving

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Paver	1	3.83	0.37	2.06	0.28	0.35	0.34	401.93
Roller	1	4.82	0.44	2.51	0.37	0.43	0.42	536.07
Truck	2	36.71	1.79	14.01	3.27	1.99	1.93	4685.95
Total per 10 acres of activity	4	45.37	2.61	18.58	3.93	2.78	2.69	5623.96

Demolition

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Loader	1	13.45	0.99	5.58	0.95	0.93	0.90	1360.10
Haul Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Total per 10 acres of activity	2	31.81	1.89	12.58	2.58	1.92	1.87	3703.07

Building Construction

Equipment[d]	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Stationary								
Generator Set	1	2.38	0.32	1.18	0.15	0.23	0.22	213.06
Industrial Saw	1	2.62	0.32	1.97	0.20	0.32	0.31	291.92
Welder	1	1.12	0.38	1.50	0.08	0.23	0.22	112.39
Mobile (non-road)								
Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Forklift	1	5.34	0.56	3.33	0.40	0.55	0.54	572.24
Crane	1	9.57	0.66	2.39	0.65	0.50	0.49	931.93
Total per 10 acres of activity	6	39.40	3.13	17.38	3.12	2.83	2.74	4464.51

Note: Footnotes for tables are on following page

Architectural Coatings

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Air Compressor	1	3.57	0.37	1.57	0.25	0.31	0.30	359.77
Total per 10 acres of activity	1	3.57	0.37	1.57	0.25	0.31	0.30	359.77

a) The SMAQMD 2004 guidance suggests a default equipment fleet for each activity, assuming 10 acres of that activity, (e.g., 10 acres of grading, 10 acres of paving, etc.). The default equipment fleet is increased for each 10 acre increment in the size of the construction project. That is, a 26 acre project would round to 30 acres and the fleet size would be three times the default fleet for a 10 acre project.

b) The SMAQMD 2004 reference lists emission factors for reactive organic gas (ROG). For the purposes of this worksheet ROG = VOC. The NONROAD model contains emissions factors for total HC and for VOC. The factors used here are the VOC factors.

c) The NONROAD emission factors assume that the average fuel burned in nonroad trucks is 1100 ppm sulfur. Trucks that would be used for the Proposed Actions will all be fueled by highway grade diesel fuel which cannot exceed 500 ppm sulfur. These estimates therefore over-estimate SO2 emissions by more than a factor of two.

d) Typical equipment fleet for building construction was not itemized in SMAQMD 2004 guidance. The equipment list above was assumed based on SMAQMD 1994 guidance.

PROJECT-SPECIFIC EMISSION FACTOR SUMMARY

Source	Equipment Multiplier*	Project-Specific Emission Factors (lb/day)						
		NO_x	VOC	CO	SO_2**	PM_{10}	$PM_{2.5}$	CO_2
Grading Equipment	1	41.641	2.577	15.710	3.449	2.546	2.469	4941.526
Paving Equipment	1	45.367	2.606	18.578	3.926	2.776	2.693	5623.957
Demolition Equipment	1	31.808	1.886	12.584	2.585	1.923	1.865	3703.074
Building Construction	1	39.396	3.130	17.382	3.116	2.829	2.744	4464.512
Air Compressor for Architectural Coating	1	3.574	0.373	1.565	0.251	0.309	0.300	359.773
Architectural Coating**			26.534					

*The equipment multiplier is an integer that represents units of 10 acres for purposes of estimating the number of equipment required for the project.

**Emission factor is from the evaporation of solvents during painting, per "Air Quality Thresholds of Significance", SMAQMD, 1994

Example: SMAQMD Emission Factor for Grading Equipment NOx = (Total Grading NOx per 10 acre)*(Equipment Multiplier)

Summary of Input Parameters

	Total Area (ft^2)	Total Area (acres)	Total Days	
Grading:	106,000	2.43	2	(from "Grading" worksheet)
Paving:	0	0.00	0	
Demolition:	0	0.00	0	
Building Construction:	106,000	2.43	240	
Architectural Coating	106,000	2.43	20	(per SMAQMD "Air Quality of Thresholds of Significance", 1994)

NOTE: The 'Total Days' estimate for paving is calculated by dividing the total number of acres by 0.21 acres/day, which is a factor derived from the 2005 MEANS Heavy Construction Cost Data, 19th Edition, for 'Asphaltic Concrete Pavement, Lots and Driveways - 6" stone base', which provides an estimate of square feet paved per day. There is also an estimate for 'Plain Cement Concrete Pavement', however the estimate for asphalt is used because it is more conservative. The 'Total 'Days' estimate for demolition is calculated by dividing the total number of acres by 0.02 acres/day, which is a factor also derived from the 2005 MEANS reference. This is calculated by averaging the demolition estimates from 'Building Demolition - Small Buildings, Concrete', assuming a height of 30 feet for a two-story building; from 'Building Footings and Foundations Demolition - 6" Thick, Plain Concrete'; and from 'Demolish, Remove Pavement and Curb - Concrete to 6" thick, rod reinforced'. Paving is double-weighted since projects typically involve more paving demolition. The 'Total Days' estimate for building construction is assumed to be 230 days, unless project-specific data is known.

Total Project Emissions by Activity (lbs)

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Grading Equipment	83.28	5.15	31.42	6.90	5.09	4.94	9,883
Paving	-	-	-	-	-	-	0
Demolition	-	-	-	-	-	-	0
Building Construction	9,455.12	751.15	4,171.75	747.92	678.97	658.60	1,071,483
Architectural Coatings	71.48	538.15	31.31	5.02	6.19	6.00	7,195
Total Emissions (lbs):	**9,609.88**	**1,294.46**	**4,234.48**	**759.85**	**690.25**	**669.54**	**1,088,561**

Results: Total Project Annual Emission Rates

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Total Project Emissions (lbs)	9,609.88	1,294.46	4,234.48	759.85	690.25	669.54	1,088,561
Total Project Emissions (tons)	4.805	0.647	2.117	0.380	0.345	0.335	544.281

Construction Fugitive Dust Emissions

Construction Fugitive Dust Emission Factors

	Emission Factor	Units	Source
Construction and Demolition Activities	0.19	ton PM_{10}/acre-month	MRI 1996; EPA 2001; EPA 2006
New Road Construction	0.42	ton PM_{10}/acre-month	MRI 1996; EPA 2001; EPA 2006

$PM_{2.5}$ Emissions

$PM_{2.5}$ Multiplier	0.10	(10% of PM_{10} emissions assumed to be $PM_{2.5}$)	EPA 2001; EPA 2006
Control Efficiency	0.50	(assume 50% control efficiency for PM_{10} and $PM_{2.5}$ emissions)	EPA 2001; EPA 2006

Project Assumptions

New Roadway Construction (0.42 ton PM_{10}/acre-month)

Duration of Construction Project	12	months
Area	0.00	acres

General Construction and Demolition Activities (0.19 ton PM_{10}/acre-month)

Duration of Project	12	months
Area	2.43	acres

	Project Emissions (tons/year)			
	PM_{10} uncontrolled	**PM_{10} controlled**	**$PM_{2.5}$ uncontrolled**	**$PM_{2.5}$ controlled**
New Roadway Construction	0.000	0.000	0.000	0.000
General Construction Activities	5.548	2.774	0.555	0.277
Total	**5.548**	**2.774**	**0.555**	**0.277**

Construction Fugitive Dust Emission Factors

General Construction Activities Emission Factor

0.19 ton PM_{10}/acre-month Source: MRI 1996; EPA 2001; EPA 2006

The area-based emission factor for construction activities is based on a study completed by the Midwest Research Institute (MRI) Improvement of Specific Emission Factors (BACM Project No. 1), March 29, 1996. The MRI study evaluated seven construction projects in Nevada and California (Las Vegas, Coachella Valley, South Coast Air Basin, and the San Joaquin Valley). The study determined an average emission factor of 0.11 ton PM_{10}/acre-month for sites without large-scale cut/fill operations. A worst-case emission factor of 0.42 ton PM_{10}/acre-month was calculated for sites with active large-scale earth moving operations. The monthly emission factors are based on 168 work-hours per month (MRI 1996). A subsequent MRI Report in 1999, Estimating Particulate Matter Emissions From Construction Operations, calculated the 0.19 ton PM_{10}/acre-month emission factor by applying 25% of the large-scale earthmoving emission factor (0.42 ton PM_{10}/acre-month) and 75% of the average emission factor (0.11 ton PM_{10}/acre-month). The 0.19 ton PM_{10}/acre-month emission factor is referenced by the EPA for non-residential construction activities in recent procedures documents for the National Emission Inventory (EPA 2001; EPA 2006). The 0.19 ton PM_{10}/acre-month emission factor represents a refinement of EPA's original AP-42 area-based total suspended particulate (TSP) emission factor in Section 13.2.3 Heavy Construction Operations. In addition to the EPA, this methodology is also supported by the South Coast Air Quality Management District as well as the Western Regional Air Partnership (WRAP) which is funded by the EPA and is administered jointly by the Western Governor's Association and the National Tribal Environmental Council. The emission factor is assumed to encompass a variety of non-residential construction activities including building construction (commercial, industrial, institutional, governmental), public works, and travel on unpaved roads. The EPA National Emission Inventory documentation assumes that the emission factors are uncontrolled and recommends a control efficiency of 50% for PM_{10} and $PM_{2.5}$ in PM nonattainment areas.

New Road Construction Emission Factor

0.42 ton PM_{10}/acre-month Source: MRI 1996; EPA 2001; EPA 2006

The emission factor for new road construction is based on the worst-case conditions emission factor from the MRI 1996 study described above (0.42 tons PM_{10}/acre-month). It is assumed that road construction involves extensive earthmoving and heavy construction vehicle travel resulting in emissions that are higher than other general construction projects. The 0.42 ton PM10/acre-month emission factor for road construction is referenced in recent procedures documents for the EPA National Emission Inventory (EPA 2001; EPA 2006).

$PM_{2.5}$ Multiplier **0.10**

$PM_{2.5}$ emissions are estimated by applying a particle size multiplier of 0.10 to PM_{10} emissions. This methodology is consistent with the procedures documents for the National Emission Inventory (EPA 2006).

Control Efficiency for PM_{10} and $PM_{2.5}$ **0.50**

The EPA National Emission Inventory documentation recommends a control efficiency of 50% for PM_{10} and $PM_{2.5}$ in PM nonattainment areas (EPA 2006). Wetting controls will be applied during project construction.

References:

EPA 2001. *Procedures Document for National Emissions Inventory, Criteria Air Pollutants, 1985-1999.* EPA-454/R-01-006. Office of Air Quality Planning and Standards, United States Environmental Protection Agency. March 2001.

EPA 2006. *Documentation for the Final 2002 Nonpoint Sector (Feb 06 version) National Emission Inventory for Criteria and Hazardous Air Pollutants.* Prepared for: Emissions Inventory and Analysis Group (C339-02) Air Quality Assessment Division Office of Air Quality Planning and Standards, United States Environmental Protection Agency. July 2006.

MRI 1996. *Improvement of Specific Emission Factors (BACM Project No. 1).* Midwest Research Institute (MRI). Prepared for the California South Coast Air Quality Management District, March 29, 1996.

Grading Schedule

Estimate of time required to grade a specified area.

Input Parameters

Construction area: 2.43 acres/yr (from Combustion Worksheet)

Qty Equipment: 3.00 (calculated based on 3 pieces of equipment for every 10 acres)

Assumptions.

Terrain is mostly flat.

An average of 6" soil is excavated from one half of the site and backfilled to the other half of the site; no soil is hauled off-site or borrowed.

200 hp bulldozers are used for site clearing.

300 hp bulldozers are used for stripping, excavation, and backfill.

Vibratory drum rollers are used for compacting.

Stripping, Excavation, Backfill and Compaction require an average of two passes each.

Excavation and Backfill are assumed to involve only half of the site.

Calculation of days required for one piece of equipment to grade the specified area.

Reference: Means Heavy Construction Cost Data, 19th Ed., R. S. Means, 2005.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day)	equip-days per acre	Acres/yr (project-specific)	Equip-days per year
2230 200 0550	Site Clearing	Dozer & rake, medium brush	8	acre/day	8	0.13	2.43	0.30
2230 500 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	2.43	1.19
2315 432 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.99	1.01	1.22	1.23
2315 120 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	1.22	0.50
2315 310 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	2,300	cu. yd/day	2.85	0.35	2.43	0.85
TOTAL								4.08

Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 4.08

Qty Equipment: 3.00

Grading days/yr: 1.36

Haul Truck Emissions

Emissions from hauling excavation material and construction supplies are estimated in this spreadsheet.
Emission Estimation Method: United States Air Force (USAF) Institute for Environment, Safety and Occupational Health Risk Analysis (IERA) Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations (Revised December 2003).

Assumptions:
Haul trucks carry 20 cubic yards of material per trip.
The average distance from the project site to the materials source is 15 miles; therefore, a haul truck will travel 30 miles round trip.
Estimated number of trips required by haul trucks = total amount of material/20 cubic yards per truck

Amount of Building Materials (Above Ground) =	47,111	cubic yards	Assumes 4 feet of building material are needed
Amount of Building Materials (Below Ground) =	19,630	cubic yards	Assumes 5 feet of material are needed for the below ground portion of the facility
Amount of Excavation Material =	47,111	cubic yards	Assumes 12 feet of material would need to be excavated on average
Number of trucks required =	5693	heavy duty diesel haul truck trips	
Miles per trip =	30	miles	

Heavy Duty Diesel Vehicle (HDDV) Average Emission Factors (grams/mile)

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
HDDV	**6.5**	**4.7**	**19.1**	**0.512**	**7.73**	**2.01**	**1645.605**

Notes:

Emission factors for all pollutants except CO_2 are from USAF IERA 2003.

Emission factors for PM, PM_{10}, SO_x are from HDDV in Table 4-50 (USAF IERA 2003).

Emission factors for VOC, CO, and NO_x are from Tables 4-41 through 4-43 for the 2010 calendar year, 2000 model year (USAF IERA 2003).

Diesel fuel produces 22.384 pounds of CO2 per gallon.

It is assumed that the average HDDV has a fuel economy of 6.17 miles per gallon, Table 4-51 (USAF IERA 2003)

CO_2 emission factor = 22.384 lbs CO_2/gallon diesel * gallon diesel/6.17 miles * 453.6 g/lb

HDDV Haul Truck Emissions

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
lbs	**2447.212**	**1769.523**	**7191.040**	**192.765**	**2910.300**	**756.753**	**619560.742**
tons	**1.224**	**0.885**	**3.596**	**0.096**	**1.455**	**0.378**	**309.780**

Example Calculation: NO_x emissions (lbs) = 30 miles per trip * 369 trips * NO_x emission factor (g/mile) * lb/453.6 g

Construction Commuter Emissions

Emissions from construction workers commuting to the job site are estimated in this spreadsheet.

Emission Estimation Method: Emission factors from the South Coast Air Quality Management District (SCAQMD) EMFAC 2007 (v 2.3) Model (on-road) were used. These emission factors are available online at http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.

Assumptions:
Passenger vehicle emission factors for scenario year 2010 are used.

The average roundtrip commute for a construction worker =	30	miles
Number of construction days =	240	days
Number of construction workers (daily) =	30	people

Passenger Vehicle Emission Factors for Year 2010 (lbs/mile)

NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
0.00091814	0.00091399	0.00826276	0.00001077	0.00008698	0.00005478	1.09568235

Source: South Coast Air Quality Management District. EMFAC 2007 (ver 2.3) On-Road Emissions Factors. Last updated April 24, 2008. Available online: <http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html>. Accessed 27 May 2009.
Notes:
The SMAQMD 2007 reference lists emission factors for reactive organic gas (ROG). For purposes of this worksheet ROG = VOC.

Construction Commuter Emissions

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
lbs	**198.318**	**197.421**	**1784.755**	**2.327**	**18.787**	**11.833**	**236667.387**
tons	**0.099**	**0.099**	**0.892**	**0.001**	**0.009**	**0.006**	**118.334**

Example Calculation: NO_x emissions (lbs) = 60 miles/day * NO_x emission factor (lb/mile) * number of construction days * number of workers

Summary	Summarizes total emissions by calendar year for Construction of the Mission Package Support Facility at NAVSTA Mayport
Combustion	Estimates emissions from non-road equipment exhaust.
Fugitive	Estimates particulate emissions from construction and demolition activities including earthmoving, vehicle traffic, and windblown dust.
Grading	Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions.
Haul Truck On-Road	Estimates emissions from haul trucks hauling fill materials to the job site.
Construction Commuter	Estimates emissions for construction workers commuting to the site.
Emergency Generator	Estimates emissions from the operation of emergency generators.
AQCR Tier Report	Summarizes total emissions for the Jackson-Brunswick Interstate Air Quality Control Region Tier report for 2008, to be used to compare construction of the Mission Package Support Facility at NAVSTA Mayport to regional emissions.

Jacksonville-Brunswick Interstate Air Quality Control Region

			All Emission Sources					
Row #	State	County	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC
1	FL	Alachua, Baker, Bradford, Clay, Columbia, Dixie, Duval, Flagler, Franklin, Gadsden, Gilchrist, Hamilton, Jefferson, Lafayette, Leon, Liberty, Madison, Marion, Nassau, Putnam, St. Johns, Suwannee, Taylor, Union, Wakulla	554,530	139,775	101,595	41,336	61,777	533,283
2	GA	Appling, Atkinson, Bacon, Brantley, Camden, Charlton, Cling, Coffee, Glynn, Long, McIntosh, Pierce, Ware, Wayne	115,275	20,546	41,949	9,861	2,054	197,739
Grand Total			669,805	160,320	143,545	51,197	63,831	731,022

SOURCE:
http://neibrowser.epa.gov/eis-public-web/home.html
USEPA National Emissions Inventory (NEI)
Emissions in tons per year for 2008

Air Emissions for Construction of the Mission Package Support Facility at NAVSTA Mayport

	NO_x (ton)	VOC (ton)	CO (ton)	SO_2 (ton)	PM_{10} (ton)	$PM_{2.5}$ (ton)	CO_2 (ton)
Combustion	2.420	0.349	1.066	0.191	0.174	0.169	273.939
Fugitive Dust	-	-	-	-	0.483	0.048	-
Haul Truck On-Road	0.205	0.148	0.601	0.016	0.243	0.063	51.788
Commuter	0.050	0.049	0.446	0.001	0.005	0.003	59.167
TOTAL	***2.674***	***0.547***	***2.114***	***0.208***	***0.905***	***0.283***	***384.894***

Note: Total $PM_{10}/_{2.5}$ fugitive dust emissions are assuming USEPA 50% control efficiencies.

CO_2 emissions converted to metric tons =	***349.099***	***metric tons***	
State of Florida's CO_2 emissions =	***227,000,000***	***metric tons***	*(U.S. DOE/EIA 2011)*
Percent of Florida's CO_2 emissions =	***0.00015%***		
United States' CO_2 emissions =	***5,425,600,000***	***metric tons***	*(U.S. DOE/EIA 2011)*
Percent of USA's CO_2 emissions =	***0.000006%***		

Source: U.S. Department of Energy, Energy Information Administration (U.S. DOE/EIA). 2012. *Table 1. State Emissions by Year (Million Metric Tons of Carbon Dioxide).* Available online <http://www.eia.gov/environment/emissions/state/state_emissions.cfm>. Data released October 2011. Data accessed 30 July 2012.

Since future year budgets were not readily available, actual 2008 air emissions inventories for the counties were used as an approximation of the regional inventory. Because Mayport Construction Activities (Scenario 1) is several orders of magnitude below significance, the conclusion would be the same, regardless of whether future year budget data set were used.

Jackson-Brunswick Interstate Air Quality Control Region

	Point and Area Sources Combined					
Year	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
2008	160,320	731,022	669,805	63,831	143,545	51,197

Source: USEPA National Emissions Inventory (NEI) (http://neibrowser.epa.gov/eis-public-web/home.html). Site visited on 30 July 2012

Air Emissions from Construction of the Mission Package Support Facility at NAVSTA Mayport

	Point and Area Sources Combined					
	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Regional Emissions	160,320	731,022	669,805	63,831	143,545	51,197
Emissions	2.674	0.547	2.114	0.208	0.905	0.283
% of Regional	**0.002%**	**0.0001%**	**0.000%**	**0.000%**	**0.001%**	**0.001%**

Combustion Emissions

Combustion Emissions of VOC, NO_x, SO_2, CO, $PM_{2.5}$, $PM_{10,}$ and CO_2 due to Construction and Demolition

	General Construction and Demolition Activities	**Area Disturbed**	
1.)	Construct Missions Package Support Facility @ NAVSTA Mayport	10,800	ft²
2.)	Construct Exterior Covered Space @ Missions Package Support Facility	26,100	ft²

Total Construction Area:	36,900	ft²	Line 1
	0.85	acres	
Total Demolition Area:	0	ft²	
	0.00	acres	
Total Pavement Area:		ft²	Line 2
	0.00	acres	
Total Disturbed Area:	36,900	ft²	Line 1 and Line 2
	0.85	acres	
Construction Duration:	6	months	
Annual Construction Activity:	120	days	Assume 4 weeks per month, 5 days per week.

Emission Factors Used for Construction Equipment

References: Guide to Air Quality Assessment, SMAQMD, 2004; and U.S. EPA NONROAD Emissions Model, Version 2005.0.0
Emission factors are taken from the NONROAD model and were provided to e²M by Larry Landman of the Air Quality and Modeling Center (Landman.Larry@epamail.epa.gov) on 12/14/07. Factors provided are for the weighted average US fleet for CY2007.
Assumptions regarding the type and number of equipment are from SMAQMD Table 3-1 unless otherwise noted.

Grading

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Bulldozer	1	13.60	0.96	5.50	1.02	0.89	0.87	1456.90
Motor Grader	1	9.69	0.73	3.20	0.80	0.66	0.64	1141.65
Water Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Total per 10 acres of activity	3	41.64	2.58	15.71	3.45	2.55	2.47	4941.53

Paving

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Paver	1	3.83	0.37	2.06	0.28	0.35	0.34	401.93
Roller	1	4.82	0.44	2.51	0.37	0.43	0.42	536.07
Truck	2	36.71	1.79	14.01	3.27	1.99	1.93	4685.95
Total per 10 acres of activity	4	45.37	2.61	18.58	3.93	2.78	2.69	5623.96

Demolition

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Loader	1	13.45	0.99	5.58	0.95	0.93	0.90	1360.10
Haul Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Total per 10 acres of activity	2	31.81	1.89	12.58	2.58	1.92	1.87	3703.07

Building Construction

Equipment[d]	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Stationary								
Generator Set	1	2.38	0.32	1.18	0.15	0.23	0.22	213.06
Industrial Saw	1	2.62	0.32	1.97	0.20	0.32	0.31	291.92
Welder	1	1.12	0.38	1.50	0.08	0.23	0.22	112.39
Mobile (non-road)								
Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Forklift	1	5.34	0.56	3.33	0.40	0.55	0.54	572.24
Crane	1	9.57	0.66	2.39	0.65	0.50	0.49	931.93
Total per 10 acres of activity	6	39.40	3.13	17.38	3.12	2.83	2.74	4464.51

Note: Footnotes for tables are on following page

Architectural Coatings

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Air Compressor	1	3.57	0.37	1.57	0.25	0.31	0.30	359.77
Total per 10 acres of activity	1	3.57	0.37	1.57	0.25	0.31	0.30	359.77

a) The SMAQMD 2004 guidance suggests a default equipment fleet for each activity, assuming 10 acres of that activity, (e.g., 10 acres of grading, 10 acres of paving, etc.). The default equipment fleet is increased for each 10 acre increment in the size of the construction project. That is, a 26 acre project would round to 30 acres and the fleet size would be three times the default fleet for a 10 acre project.

b) The SMAQMD 2004 reference lists emission factors for reactive organic gas (ROG). For the purposes of this worksheet ROG = VOC. The NONROAD model contains emissions factors for total HC and for VOC. The factors used here are the VOC factors.

c) The NONROAD emission factors assume that the average fuel burned in nonroad trucks is 1100 ppm sulfur. Trucks that would be used for the Proposed Actions will all be fueled by highway grade diesel fuel which cannot exceed 500 ppm sulfur. These estimates therefore over-estimate SO2 emissions by more than a factor of two.

d) Typical equipment fleet for building construction was not itemized in SMAQMD 2004 guidance. The equipment list above was assumed based on SMAQMD 1994 guidance.

PROJECT-SPECIFIC EMISSION FACTOR SUMMARY

Source	Equipment Multiplier*	Project-Specific Emission Factors (lb/day)						
		NO_x	VOC	CO	SO_2**	PM_{10}	$PM_{2.5}$	CO_2
Grading Equipment	1	41.641	2.577	15.710	3.449	2.546	2.469	4941.526
Paving Equipment	1	45.367	2.606	18.578	3.926	2.776	2.693	5623.957
Demolition Equipment	1	31.808	1.886	12.584	2.585	1.923	1.865	3703.074
Building Construction	1	39.396	3.130	17.382	3.116	2.829	2.744	4464.512
Air Compressor for Architectural Coating	1	3.574	0.373	1.565	0.251	0.309	0.300	359.773
Architectural Coating**			15.656					

*The equipment multiplier is an integer that represents units of 10 acres for purposes of estimating the number of equipment required for the project.

**Emission factor is from the evaporation of solvents during painting, per "Air Quality Thresholds of Significance", SMAQMD, 1994

Example: SMAQMD Emission Factor for Grading Equipment NOx = (Total Grading NOx per 10 acre)*(Equipment Multiplier)

Summary of Input Parameters

	Total Area (ft^2)	Total Area (acres)	Total Days	
Grading:	36,900	0.85	1	(from "Grading" worksheet)
Paving:	0	0.00	0	
Demolition:	0	0.00	0	
Building Construction:	36,900	0.85	120	
Architectural Coating	36,900	0.85	20	(per SMAQMD "Air Quality of Thresholds of Significance", 1994)

NOTE: The 'Total Days' estimate for paving is calculated by dividing the total number of acres by 0.21 acres/day, which is a factor derived from the 2005 MEANS Heavy Construction Cost Data, 19th Edition, for 'Asphaltic Concrete Pavement, Lots and Driveways - 6" stone base', which provides an estimate of square feet paved per day. There is also an estimate for 'Plain Cement Concrete Pavement', however the estimate for asphalt is used because it is more conservative. The 'Total 'Days' estimate for demolition is calculated by dividing the total number of acres by 0.02 acres/day, which is a factor also derived from the 2005 MEANS reference. This is calculated by averaging the demolition estimates from 'Building Demolition - Small Buildings, Concrete', assuming a height of 30 feet for a two-story building; from 'Building Footings and Foundations Demolition - 6" Thick, Plain Concrete'; and from 'Demolish, Remove Pavement and Curb - Concrete to 6" thick, rod reinforced'. Paving is double-weighted since projects typically involve more paving demolition. The 'Total Days' estimate for building construction is assumed to be 230 days, unless project-specific data is known.

Total Project Emissions by Activity (lbs)

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Grading Equipment	41.64	2.58	15.71	3.45	2.55	2.47	4,942
Paving	-	-	-	-	-	-	0
Demolition	-	-	-	-	-	-	0
Building Construction	4,727.56	375.58	2,085.88	373.96	339.49	329.30	535,741
Architectural Coatings	71.48	320.58	31.31	5.02	6.19	6.00	7,195
Total Emissions (lbs):	**4,840.68**	**698.73**	**2,132.90**	**382.43**	**348.22**	**337.77**	**547,878**

Results: Total Project Annual Emission Rates

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Total Project Emissions (lbs)	4,840.68	698.73	2,132.90	382.43	348.22	337.77	547,878
Total Project Emissions (tons)	2.420	0.349	1.066	0.191	0.174	0.169	273.939

Construction Fugitive Dust Emissions

Construction Fugitive Dust Emission Factors

	Emission Factor	Units	Source
Construction and Demolition Activities	0.19	ton PM_{10}/acre-month	MRI 1996; EPA 2001; EPA 2006
New Road Construction	0.42	ton PM_{10}/acre-month	MRI 1996; EPA 2001; EPA 2006

$PM_{2.5}$ Emissions

$PM_{2.5}$ Multiplier	0.10	(10% of PM_{10} emissions assumed to be $PM_{2.5}$)	EPA 2001; EPA 2006
Control Efficiency	0.50	(assume 50% control efficiency for PM_{10} and $PM_{2.5}$ emissions)	EPA 2001; EPA 2006

Project Assumptions

New Roadway Construction (0.42 ton PM_{10}/acre-month)

Duration of Construction Project	6	months
Area	0.00	acres

General Construction and Demolition Activities (0.19 ton PM_{10}/acre-month)

Duration of Project	6	months
Area	0.85	acres

	Project Emissions (tons/year)			
	PM_{10} uncontrolled	**PM_{10} controlled**	**$PM_{2.5}$ uncontrolled**	**$PM_{2.5}$ controlled**
New Roadway Construction	0.000	0.000	0.000	0.000
General Construction Activities	0.966	0.483	0.097	0.048
Total	**0.966**	**0.483**	**0.097**	**0.048**

Construction Fugitive Dust Emission Factors

General Construction Activities Emission Factor

0.19 ton PM_{10}/acre-month Source: MRI 1996; EPA 2001; EPA 2006

The area-based emission factor for construction activities is based on a study completed by the Midwest Research Institute (MRI) Improvement of Specific Emission Factors (BACM Project No. 1), March 29, 1996. The MRI study evaluated seven construction projects in Nevada and California (Las Vegas, Coachella Valley, South Coast Air Basin, and the San Joaquin Valley). The study determined an average emission factor of 0.11 ton PM_{10}/acre-month for sites without large-scale cut/fill operations. A worst-case emission factor of 0.42 ton PM_{10}/acre-month was calculated for sites with active large-scale earth moving operations. The monthly emission factors are based on 168 work-hours per month (MRI 1996). A subsequent MRI Report in 1999, Estimating Particulate Matter Emissions From Construction Operations, calculated the 0.19 ton PM_{10}/acre-month emission factor by applying 25% of the large-scale earthmoving emission factor (0.42 ton PM_{10}/acre-month) and 75% of the average emission factor (0.11 ton PM_{10}/acre-month). The 0.19 ton PM_{10}/acre-month emission factor is referenced by the EPA for non-residential construction activities in recent procedures documents for the National Emission Inventory (EPA 2001; EPA 2006). The 0.19 ton PM_{10}/acre-month emission factor represents a refinement of EPA's original AP-42 area-based total suspended particulate (TSP) emission factor in Section 13.2.3 Heavy Construction Operations. In addition to the EPA, this methodology is also supported by the South Coast Air Quality Management District as well as the Western Regional Air Partnership (WRAP) which is funded by the EPA and is administered jointly by the Western Governor's Association and the National Tribal Environmental Council. The emission factor is assumed to encompass a variety of non-residential construction activities including building construction (commercial, industrial, institutional, governmental), public works, and travel on unpaved roads. The EPA National Emission Inventory documentation assumes that the emission factors are uncontrolled and recommends a control efficiency of 50% for PM_{10} and $PM_{2.5}$ in PM nonattainment areas.

New Road Construction Emission Factor

0.42 ton PM_{10}/acre-month Source: MRI 1996; EPA 2001; EPA 2006

The emission factor for new road construction is based on the worst-case conditions emission factor from the MRI 1996 study described above (0.42 tons PM_{10}/acre-month). It is assumed that road construction involves extensive earthmoving and heavy construction vehicle travel resulting in emissions that are higher than other general construction projects. The 0.42 ton PM10/acre-month emission factor for road construction is referenced in recent procedures documents for the EPA National Emission Inventory (EPA 2001; EPA 2006).

$PM_{2.5}$ Multiplier **0.10**

$PM_{2.5}$ emissions are estimated by applying a particle size multiplier of 0.10 to PM_{10} emissions. This methodology is consistent with the procedures documents for the National Emission Inventory (EPA 2006).

Control Efficiency for PM_{10} and $PM_{2.5}$ **0.50**

The EPA National Emission Inventory documentation recommends a control efficiency of 50% for PM_{10} and $PM_{2.5}$ in PM nonattainment areas (EPA 2006). Wetting controls will be applied during project construction.

References:

EPA 2001. *Procedures Document for National Emissions Inventory, Criteria Air Pollutants, 1985-1999.* EPA-454/R-01-006. Office of Air Quality Planning and Standards, United States Environmental Protection Agency. March 2001.

EPA 2006. *Documentation for the Final 2002 Nonpoint Sector (Feb 06 version) National Emission Inventory for Criteria and Hazardous Air Pollutants.* Prepared for: Emissions Inventory and Analysis Group (C339-02) Air Quality Assessment Division Office of Air Quality Planning and Standards, United States Environmental Protection Agency. July 2006.

MRI 1996. *Improvement of Specific Emission Factors (BACM Project No. 1).* Midwest Research Institute (MRI). Prepared for the California South Coast Air Quality Management District, March 29, 1996.

Grading Schedule

Estimate of time required to grade a specified area.

Input Parameters

Construction area: 0.85 acres/yr (from Combustion Worksheet)

Qty Equipment: 3.00 (calculated based on 3 pieces of equipment for every 10 acres)

Assumptions.

Terrain is mostly flat.

An average of 6" soil is excavated from one half of the site and backfilled to the other half of the site; no soil is hauled off-site or borrowed.

200 hp bulldozers are used for site clearing.

300 hp bulldozers are used for stripping, excavation, and backfill.

Vibratory drum rollers are used for compacting.

Stripping, Excavation, Backfill and Compaction require an average of two passes each.

Excavation and Backfill are assumed to involve only half of the site.

Calculation of days required for one piece of equipment to grade the specified area.

Reference: Means Heavy Construction Cost Data, 19th Ed., R. S. Means, 2005.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day)	equip-days per acre	Acres/yr (project-specific)	Equip-days per year
2230 200 0550	Site Clearing	Dozer & rake, medium brush	8	acre/day	8	0.13	0.85	0.11
2230 500 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	0.85	0.41
2315 432 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.99	1.01	0.42	0.43
2315 120 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	0.42	0.18
2315 310 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	2,300	cu. yd/day	2.85	0.35	0.85	0.30
TOTAL								1.42

Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 1.42

Qty Equipment: 3.00

Grading days/yr: 0.47

Haul Truck Emissions

Emissions from hauling excavation material and construction supplies are estimated in this spreadsheet.
Emission Estimation Method: United States Air Force (USAF) Institute for Environment, Safety and Occupational Health Risk Analysis (IERA) Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations (Revised December 2003).

Assumptions:
Haul trucks carry 20 cubic yards of material per trip.
The average distance from the project site to a materials source is 15 miles; therefore, a haul truck will travel 30 miles round trip.
Estimated number of trips required by haul trucks = total amount of material/20 cubic yards per truck

Amount of Building Materials (Above Ground) =	3,533	cubic yards	Assumes 4 feet of building material are needed for the building and 2 feet of building material are needed for exterior covered space
Amount of Building Materials (Below Ground) =	4,900	cubic yards	Assumes 5 feet of material are needed for the below ground portion of the facility and 3 feet of material are needed for exterior covered space
Amount of Excavation Material =	10,600	cubic yards	Assumes 12 feet of material would need to be excavated on average for the building and 6 feet of material would need to be excavated on average for the exterior covered space
Number of trucks required =	952	heavy duty diesel haul truck trips	
Miles per trip =	30	miles	

Heavy Duty Diesel Vehicle (HDDV) Average Emission Factors (grams/mile)

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
HDDV	**6.5**	**4.7**	**19.1**	**0.512**	**7.73**	**2.01**	**1645.605**

Notes:
Emission factors for all pollutants except CO_2 are from USAF IERA 2003.
Emission factors for PM, PM_{10}, SO_x are from HDDV in Table 4-50 (USAF IERA 2003).
Emission factors for VOC, CO, and NO_x are from Tables 4-41 through 4-43 for the 2010 calendar year, 2000 model year (USAF IERA 2003).
Diesel fuel produces 22.384 pounds of CO2 per gallon.
It is assumed that the average HDDV has a fuel economy of 6.17 miles per gallon, Table 4-51 (USAF IERA 2003)
CO_2 emission factor = 22.384 lbs CO_2/gallon diesel * gallon diesel/6.17 miles * 453.6 g/lb

HDDV Haul Truck Emissions

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
lbs	**409.116**	**295.822**	**1202.172**	**32.226**	**486.533**	**126.511**	**103575.883**
tons	**0.205**	**0.148**	**0.601**	**0.016**	**0.243**	**0.063**	**51.788**

Example Calculation: NO_x emissions (lbs) = 30 miles per trip * 369 trips * NO_x emission factor (g/mile) * lb/453.6 g

Construction Commuter Emissions

Emissions from construction workers commuting to the job site are estimated in this spreadsheet.

Emission Estimation Method: Emission factors from the South Coast Air Quality Management District (SCAQMD) EMFAC 2007 (v 2.3) Model (on-road) were used. These emission factors are available online at http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.

Assumptions:
Passenger vehicle emission factors for scenario year 2010 are used.

The average roundtrip commute for a construction worker =	30	miles
Number of construction days =	120	days
Number of construction workers (daily) =	30	people

Passenger Vehicle Emission Factors for Year 2010 (lbs/mile)

NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
0.00091814	0.00091399	0.00826276	0.00001077	0.00008698	0.00005478	1.09568235

Source: South Coast Air Quality Management District. EMFAC 2007 (ver 2.3) On-Road Emissions Factors. Last updated April 24, 2008. Available online: <http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html>. Accessed 27 May 2009.
Notes:
The SMAQMD 2007 reference lists emission factors for reactive organic gas (ROG). For purposes of this worksheet ROG = VOC.

Construction Commuter Emissions

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
lbs	**99.159**	**98.711**	**892.378**	**1.164**	**9.394**	**5.916**	**118333.694**
tons	**0.050**	**0.049**	**0.446**	**0.001**	**0.005**	**0.003**	**59.167**

Example Calculation: NO_x emissions (lbs) = 60 miles/day * NO_x emission factor (lb/mile) * number of construction days * number of workers

Jacksonville-Brunswick Interstate Air Quality Control Region

			All Emission Sources					
Row #	State	County	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC
1	FL	Alachua, Baker, Bradford, Clay, Columbia, Dixie, Duval, Flagler, Franklin, Gadsden, Gilchrist, Hamilton, Jefferson, Lafayette, Leon, Liberty, Madison, Marion, Nassau, Putnam, St. Johns, Suwannee, Taylor, Union, Wakulla	554,530	139,775	101,595	41,336	61,777	533,283
2	GA	Appling, Atkinson, Bacon, Brantley, Camden, Charlton, Cling, Coffee, Glynn, Long, McIntosh, Pierce, Ware, Wayne	115,275	20,546	41,949	9,861	2,054	197,739
Grand Total			669,805	160,320	143,545	51,197	63,831	731,022

SOURCE:
http://neibrowser.epa.gov/eis-public-web/home.html
USEPA National Emissions Inventory (NEI)
Emissions in tons per year for 2008

Littoral Combat Ship (LCS) Mission Support Personnel Commuter Emissions

Emissions from LCS mission support personnel commuting to NAVSTA Mayport or NAVSTA Norfolk are estimated in this spreadsheet.

For the purposes of this EA, it is assumed that up to 21 crews (1,050 ship company crew personnel and up to 399 mission package crew personnel) would be stationed at NAVSTA Mayport or NAVSTA Norfolk. In addition, 242 on-installation LCS support personnel would be stationed at the homeport location. This would equate to a total increase of approximately 1,700 personnel for all 14 LCS. Also included were approximately 900 additional vehicles for family members, for a total of approximately 2,600 commuting people.

Emission Estimation Method: Emission factors from the South Coast Air Quality Management District (SCAQMD) EMFAC 2007 (v 2.3) Model (on-road) were used. These emission factors are available online at http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.

Assumptions:

Passenger vehicle emission factors for scenario year 2013 are used

The average roundtrip commute for LCS mission support personnel =	25	miles
Number of LCS mission days =	250	days
Number of LCS mission support personnel (daily) =	2,600	people

Passenger Vehicle Emission Factors for Year 2013 (lbs/mile)

NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
0.00071158	0.00074567	0.00709228	0.00001072	0.00009067	0.00005834	1.10087435

Source: South Coast Air Quality Management District. EMFAC 2007 (ver 2.3) On-Road Emissions Factors. Last updated 24 April 2008. Available online: <http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html>. Accessed 7 June 2010.
Notes:
The SMAQMD 2007 reference lists emission factors for reactive organic gas (ROG). For purposes of this worksheet ROG = VOC

LCS Mission Support Personnel Commuter Emissions Per Year

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
lbs	**11,563.12**	**12,117.08**	**115,249.60**	**174.18**	**1,473.33**	**948.11**	**17,889,208.12**
tons	**5.78**	**6.06**	**57.62**	**0.09**	**0.74**	**0.47**	**8,944.60**

Example Calculation: NO_x emissions (lbs) = 60 miles/day * NO_x emission factor (lb/mile) * number of construction days * number of personnel.

Littoral Combat Ship (LCS) Mission Support Personnel Commuter Emissions

Emissions from LCS mission support personnel commuting to NSB Kings Bay are estimated in this spreadsheet.

For the purposes of this EA, it is assumed that up to 21 crews (1,050 ship company crew personnel and up to 399 mission package crew personnel) would be stationed at NAVSTA Mayport. In addition, 242 on-installation LCS support personnel would be stationed at the homeport location. This would equate to a total increase of approximately 1,700 for all 14 LCS.

For the purposes of this analysis, it is assumed that 30 personnel would be assigned to NSB Kings Bay under Scenario 2.

Emission Estimation Method: Emission factors from the South Coast Air Quality Management District (SCAQMD) EMFAC 2007 (v 2.3) Model (on-road) were used. These emission factors are available online at http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.

Assumptions:

Passenger vehicle emission factors for scenario year 2013 are used

The average roundtrip commute for LCS mission support personnel =	30	miles
Number of LCS mission days =	250	days
Number of LCS mission support personnel (daily) =	30	people

Passenger Vehicle Emission Factors for Year 2013 (lbs/mile)

NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
0.00071158	0.00074567	0.00709228	0.00001072	0.00009067	0.00005834	1.10087435

Source: South Coast Air Quality Management District. EMFAC 2007 (ver 2.3) On-Road Emissions Factors. Last updated 24 April 2008. Available online: <http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html>. Accessed 7 June 2010.
Notes:
The SMAQMD 2007 reference lists emission factors for reactive organic gas (ROG). For purposes of this worksheet ROG = VOC

LCS Mission Support Personnel Commuter Emissions Per Year

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
lbs	**160.10**	**167.77**	**1,595.76**	**2.41**	**20.40**	**13.13**	**247,696.73**
tons	**0.08**	**0.08**	**0.80**	**0.00**	**0.01**	**0.01**	**123.85**

Example Calculation: NO_x emissions (lbs) = 60 miles/day * NO_x emission factor (lb/mile) * number of construction days * number of personnel.

Summary	Summarizes total emissions by calendar year for Construction of the LCS Support Facility at NAVSTA Norfolk
Combustion	Estimates emissions from non-road equipment exhaust.
Fugitive	Estimates particulate emissions from construction and demolition activities including earthmoving, vehicle traffic, and windblown dust.
Grading	Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions.
Haul Truck On-Road	Estimates emissions from haul trucks hauling fill materials to the job site.
Construction Commuter	Estimates emissions for construction workers commuting to the site.
Emergency Generator	Estimates emissions from the operation of emergency generators.
AQCR Tier Report	Summarizes total emissions for the Jackson-Brunswick Interstate Air Quality Control Region Tier report for 2008, to be used to compare construction of the LCS Support Facility at NAVSTA Norfolk to regional emissions.

Air Emissions for Construction of the LCS Support Facility at NAVSTA Norfolk

	NO_x (ton)	VOC (ton)	CO (ton)	SO_2 (ton)	PM_{10} (ton)	$PM_{2.5}$ (ton)	CO_2 (ton)
Combustion	5.075	0.609	2.227	0.403	0.362	0.351	577.683
Fugitive Dust	-	-	-	-	7.177	0.718	-
Haul Truck On-Road	0.774	0.560	2.275	0.061	0.921	0.239	196.024
Commuter	0.099	0.099	0.892	0.001	0.009	0.006	118.334
TOTAL	***5.949***	***1.267***	***5.395***	***0.465***	***8.469***	***1.314***	***892.041***

Note: Total $PM_{10}/_{2.5}$ fugitive dust emissions are assuming USEPA 50% control efficiencies.

CO_2 emissions converted to metric tons =	***809.081***	***metric tons***	
State of Virginia's CO_2 emissions =	***106,000,000***	***metric tons***	*(U.S. DOE/EIA 2011)*
Percent of Virginia's CO_2 emissions =	***0.00076%***		
United States' CO_2 emissions =	***5,425,600,000***	***metric tons***	*(U.S. DOE/EIA 2011)*
Percent of USA's CO_2 emissions =	***0.000015%***		

Source: U.S. Department of Energy, Energy Information Administration (U.S. DOE/EIA). 2012. *Table 1. State Emissions by Year (Million Metric Tons of Carbon Dioxide).* Available online <http://www.eia.gov/environment/emissions/state/state_emissions.cfm>. Data released October 2011. Data accessed 30 July 2012.

Since future year budgets were not readily available, actual 2008 air emissions inventories for the counties were used as an approximation of the regional inventory. Because Norfolk Construction Activities (Scenario 1) is several orders of magnitude below significance, the conclusion would be the same, regardless of whether future year budget data set were used.

Hampton Roads Interstate Air Quality Control Region

	Point and Area Sources Combined					
Year	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
2008	54,400	64,663	150,912	56,209	18,946	8,429

Source: USEPA National Emissions Inventory (NEI) (http://neibrowser.epa.gov/eis-public-web/home.html). Site visited on 30 July 2012

Air Emissions from Construction of the LCS Support Facility at NAVSTA Norfolk

	Point and Area Sources Combined					
	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Regional Emissions	54,400	64,663	150,912	56,209	18,946	8,429
Emissions	5.949	1.267	5.395	0.465	8.469	1.314
% of Regional	**0.011%**	**0.0020%**	**0.004%**	**0.001%**	**0.045%**	**0.016%**

Combustion Emissions

Combustion Emissions of VOC, NO_x, SO_2, CO, $PM_{2.5}$, $PM_{10,}$ and CO_2 due to Construction and Demolition

	General Construction and Demolition Activities	**Area Disturbed**
1.)	Construct LCS Support Facility @ NAVSTA Norfolk	67,075 ft²
2.)	Construct Parking for LCS Support Facility @ NAVSTA Norfolk	93,712 ft²

Total Construction Area:	67,075	ft²	Line 1
	1.54	acres	
Total Demolition Area:	0	ft²	
	0.00	acres	
Total Pavement Area:	93,712	ft²	Line 2
	2.15	acres	
Total Disturbed Area:	160,787	ft²	Line 1 and Line 2
	3.69	acres	
Construction Duration:	12	months	
Annual Construction Activity:	240	days	Assume 4 weeks per month, 5 days per week.

Emission Factors Used for Construction Equipment

References: Guide to Air Quality Assessment, SMAQMD, 2004; and U.S. EPA NONROAD Emissions Model, Version 2005.0.0
Emission factors are taken from the NONROAD model and were provided to e²M by Larry Landman of the Air Quality and Modeling Center (Landman.Larry@epamail.epa.gov) on 12/14/07. Factors provided are for the weighted average US fleet for CY2007.
Assumptions regarding the type and number of equipment are from SMAQMD Table 3-1 unless otherwise noted.

Grading

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Bulldozer	1	13.60	0.96	5.50	1.02	0.89	0.87	1456.90
Motor Grader	1	9.69	0.73	3.20	0.80	0.66	0.64	1141.65
Water Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Total per 10 acres of activity	3	41.64	2.58	15.71	3.45	2.55	2.47	4941.53

Paving

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Paver	1	3.83	0.37	2.06	0.28	0.35	0.34	401.93
Roller	1	4.82	0.44	2.51	0.37	0.43	0.42	536.07
Truck	2	36.71	1.79	14.01	3.27	1.99	1.93	4685.95
Total per 10 acres of activity	4	45.37	2.61	18.58	3.93	2.78	2.69	5623.96

Demolition

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Loader	1	13.45	0.99	5.58	0.95	0.93	0.90	1360.10
Haul Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Total per 10 acres of activity	2	31.81	1.89	12.58	2.58	1.92	1.87	3703.07

Building Construction

Equipment[d]	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Stationary								
Generator Set	1	2.38	0.32	1.18	0.15	0.23	0.22	213.06
Industrial Saw	1	2.62	0.32	1.97	0.20	0.32	0.31	291.92
Welder	1	1.12	0.38	1.50	0.08	0.23	0.22	112.39
Mobile (non-road)								
Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Forklift	1	5.34	0.56	3.33	0.40	0.55	0.54	572.24
Crane	1	9.57	0.66	2.39	0.65	0.50	0.49	931.93
Total per 10 acres of activity	6	39.40	3.13	17.38	3.12	2.83	2.74	4464.51

Note: Footnotes for tables are on following page

Architectural Coatings

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Air Compressor	1	3.57	0.37	1.57	0.25	0.31	0.30	359.77
Total per 10 acres of activity	1	3.57	0.37	1.57	0.25	0.31	0.30	359.77

a) The SMAQMD 2004 guidance suggests a default equipment fleet for each activity, assuming 10 acres of that activity, (e.g., 10 acres of grading, 10 acres of paving, etc.). The default equipment fleet is increased for each 10 acre increment in the size of the construction project. That is, a 26 acre project would round to 30 acres and the fleet size would be three times the default fleet for a 10 acre project.

b) The SMAQMD 2004 reference lists emission factors for reactive organic gas (ROG). For the purposes of this worksheet ROG = VOC. The NONROAD model contains emissions factors for total HC and for VOC. The factors used here are the VOC factors.

c) The NONROAD emission factors assume that the average fuel burned in nonroad trucks is 1100 ppm sulfur. Trucks that would be used for the Proposed Actions will all be fueled by highway grade diesel fuel which cannot exceed 500 ppm sulfur. These estimates therefore over-estimate SO2 emissions by more than a factor of two.

d) Typical equipment fleet for building construction was not itemized in SMAQMD 2004 guidance. The equipment list above was assumed based on SMAQMD 1994 guidance.

PROJECT-SPECIFIC EMISSION FACTOR SUMMARY

Source	Equipment Multiplier*	Project-Specific Emission Factors (lb/day)						
		NO_x	VOC	CO	SO_2**	PM_{10}	$PM_{2.5}$	CO_2
Grading Equipment	1	41.641	2.577	15.710	3.449	2.546	2.469	4941.526
Paving Equipment	1	45.367	2.606	18.578	3.926	2.776	2.693	5623.957
Demolition Equipment	1	31.808	1.886	12.584	2.585	1.923	1.865	3703.074
Building Construction	1	39.396	3.130	17.382	3.116	2.829	2.744	4464.512
Air Compressor for Architectural Coating	1	3.574	0.373	1.565	0.251	0.309	0.300	359.773
Architectural Coating**			21.108					

*The equipment multiplier is an integer that represents units of 10 acres for purposes of estimating the number of equipment required for the project.

**Emission factor is from the evaporation of solvents during painting, per "Air Quality Thresholds of Significance", SMAQMD, 1994

Example: SMAQMD Emission Factor for Grading Equipment NOx = (Total Grading NOx per 10 acre)*(Equipment Multiplier)

Summary of Input Parameters

	Total Area (ft^2)	Total Area (acres)	Total Days	
Grading:	160,787	3.69	3	(from "Grading" worksheet)
Paving:	93,712	2.15	11	
Demolition:	0	0.00	0	
Building Construction:	67,075	1.54	240	
Architectural Coating	67,075	1.54	20	(per SMAQMD "Air Quality of Thresholds of Significance", 1994)

NOTE: The 'Total Days' estimate for paving is calculated by dividing the total number of acres by 0.21 acres/day, which is a factor derived from the 2005 MEANS Heavy Construction Cost Data, 19th Edition, for 'Asphaltic Concrete Pavement, Lots and Driveways - 6" stone base', which provides an estimate of square feet paved per day. There is also an estimate for 'Plain Cement Concrete Pavement', however the estimate for asphalt is used because it is more conservative. The 'Total 'Days' estimate for demolition is calculated by dividing the total number of acres by 0.02 acres/day, which is a factor also derived from the 2005 MEANS reference. This is calculated by averaging the demolition estimates from 'Building Demolition - Small Buildings, Concrete', assuming a height of 30 feet for a two-story building; from 'Building Footings and Foundations Demolition - 6" Thick, Plain Concrete'; and from 'Demolish, Remove Pavement and Curb - Concrete to 6" thick, rod reinforced'. Paving is double-weighted since projects typically involve more paving demolition. The 'Total Days' estimate for building construction is assumed to be 230 days, unless project-specific data is known.

Total Project Emissions by Activity (lbs)

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Grading Equipment	124.92	7.73	47.13	10.35	7.64	7.41	14,825
Paving	499.04	28.66	204.36	43.18	30.54	29.62	61,864
Demolition	-	-	-	-	-	-	0
Building Construction	9,455.12	751.15	4,171.75	747.92	678.97	658.60	1,071,483
Architectural Coatings	71.48	429.61	31.31	5.02	6.19	6.00	7,195
Total Emissions (lbs):	**10,150.56**	**1,217.16**	**4,454.56**	**806.48**	**723.33**	**701.63**	**1,155,366**

Results: Total Project Annual Emission Rates

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Total Project Emissions (lbs)	10,150.56	1,217.16	4,454.56	806.48	723.33	701.63	1,155,366
Total Project Emissions (tons)	5.075	0.609	2.227	0.403	0.362	0.351	577.683

Construction Fugitive Dust Emissions

Construction Fugitive Dust Emission Factors

	Emission Factor	Units	Source
Construction and Demolition Activities	0.19	ton PM_{10}/acre-month	MRI 1996; EPA 2001; EPA 2006
New Road Construction	0.42	ton PM_{10}/acre-month	MRI 1996; EPA 2001; EPA 2006

$PM_{2.5}$ Emissions

$PM_{2.5}$ Multiplier	0.10	(10% of PM_{10} emissions assumed to be $PM_{2.5}$)	EPA 2001; EPA 2006
Control Efficiency	0.50	(assume 50% control efficiency for PM_{10} and $PM_{2.5}$ emissions)	EPA 2001; EPA 2006

Project Assumptions

New Roadway Construction (0.42 ton PM_{10}/acre-month)

Duration of Construction Project	12	months
Area	2.15	acres

General Construction and Demolition Activities (0.19 ton PM_{10}/acre-month)

Duration of Project	12	months
Area	1.54	acres

	Project Emissions (tons/year)			
	PM_{10} uncontrolled	**PM_{10} controlled**	**$PM_{2.5}$ uncontrolled**	**$PM_{2.5}$ controlled**
New Roadway Construction	10.843	5.421	1.084	0.542
General Construction Activities	3.511	1.755	0.351	0.176
Total	**14.354**	**7.177**	**1.435**	**0.718**

Construction Fugitive Dust Emission Factors

General Construction Activities Emission Factor

0.19 ton PM_{10}/acre-month Source: MRI 1996; EPA 2001; EPA 2006

The area-based emission factor for construction activities is based on a study completed by the Midwest Research Institute (MRI) Improvement of Specific Emission Factors (BACM Project No. 1), March 29, 1996. The MRI study evaluated seven construction projects in Nevada and California (Las Vegas, Coachella Valley, South Coast Air Basin, and the San Joaquin Valley). The study determined an average emission factor of 0.11 ton PM_{10}/acre-month for sites without large-scale cut/fill operations. A worst-case emission factor of 0.42 ton PM_{10}/acre-month was calculated for sites with active large-scale earth moving operations. The monthly emission factors are based on 168 work-hours per month (MRI 1996). A subsequent MRI Report in 1999, Estimating Particulate Matter Emissions From Construction Operations, calculated the 0.19 ton PM_{10}/acre-month emission factor by applying 25% of the large-scale earthmoving emission factor (0.42 ton PM_{10}/acre-month) and 75% of the average emission factor (0.11 ton PM_{10}/acre-month). The 0.19 ton PM_{10}/acre-month emission factor is referenced by the EPA for non-residential construction activities in recent procedures documents for the National Emission Inventory (EPA 2001; EPA 2006). The 0.19 ton PM_{10}/acre-month emission factor represents a refinement of EPA's original AP-42 area-based total suspended particulate (TSP) emission factor in Section 13.2.3 Heavy Construction Operations. In addition to the EPA, this methodology is also supported by the South Coast Air Quality Management District as well as the Western Regional Air Partnership (WRAP) which is funded by the EPA and is administered jointly by the Western Governor's Association and the National Tribal Environmental Council. The emission factor is assumed to encompass a variety of non-residential construction activities including building construction (commercial, industrial, institutional, governmental), public works, and travel on unpaved roads. The EPA National Emission Inventory documentation assumes that the emission factors are uncontrolled and recommends a control efficiency of 50% for PM_{10} and $PM_{2.5}$ in PM nonattainment areas.

New Road Construction Emission Factor

0.42 ton PM_{10}/acre-month Source: MRI 1996; EPA 2001; EPA 2006

The emission factor for new road construction is based on the worst-case conditions emission factor from the MRI 1996 study described above (0.42 tons PM_{10}/acre-month). It is assumed that road construction involves extensive earthmoving and heavy construction vehicle travel resulting in emissions that are higher than other general construction projects. The 0.42 ton PM10/acre-month emission factor for road construction is referenced in recent procedures documents for the EPA National Emission Inventory (EPA 2001; EPA 2006).

$PM_{2.5}$ Multiplier **0.10**

$PM_{2.5}$ emissions are estimated by applying a particle size multiplier of 0.10 to PM_{10} emissions. This methodology is consistent with the procedures documents for the National Emission Inventory (EPA 2006).

Control Efficiency for PM_{10} and $PM_{2.5}$ **0.50**

The EPA National Emission Inventory documentation recommends a control efficiency of 50% for PM_{10} and $PM_{2.5}$ in PM nonattainment areas (EPA 2006). Wetting controls will be applied during project construction.

References:

EPA 2001. *Procedures Document for National Emissions Inventory, Criteria Air Pollutants, 1985-1999.* EPA-454/R-01-006. Office of Air Quality Planning and Standards, United States Environmental Protection Agency. March 2001.

EPA 2006. *Documentation for the Final 2002 Nonpoint Sector (Feb 06 version) National Emission Inventory for Criteria and Hazardous Air Pollutants.* Prepared for: Emissions Inventory and Analysis Group (C339-02) Air Quality Assessment Division Office of Air Quality Planning and Standards, United States Environmental Protection Agency. July 2006.

MRI 1996. *Improvement of Specific Emission Factors (BACM Project No. 1).* Midwest Research Institute (MRI). Prepared for the California South Coast Air Quality Management District, March 29, 1996.

Grading Schedule

Estimate of time required to grade a specified area.

Input Parameters

Construction area: 3.69 acres/yr (from Combustion Worksheet)

Qty Equipment: 3.00 (calculated based on 3 pieces of equipment for every 10 acres)

Assumptions.

Terrain is mostly flat.

An average of 6" soil is excavated from one half of the site and backfilled to the other half of the site; no soil is hauled off-site or borrowed.

200 hp bulldozers are used for site clearing.

300 hp bulldozers are used for stripping, excavation, and backfill.

Vibratory drum rollers are used for compacting.

Stripping, Excavation, Backfill and Compaction require an average of two passes each.

Excavation and Backfill are assumed to involve only half of the site.

Calculation of days required for one piece of equipment to grade the specified area.

Reference: Means Heavy Construction Cost Data, 19th Ed., R. S. Means, 2005.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day)	equip-days per acre	Acres/yr (project-specific)	Equip-days per year
2230 200 0550	Site Clearing	Dozer & rake, medium brush	8	acre/day	8	0.13	3.69	0.46
2230 500 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	3.69	1.80
2315 432 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.99	1.01	1.85	1.86
2315 120 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	1.85	0.76
2315 310 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	2,300	cu. yd/day	2.85	0.35	3.69	1.29
TOTAL								6.18

Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 6.18

Qty Equipment: 3.00

Grading days/yr: 2.06

Haul Truck Emissions

Emissions from hauling excavation material and construction supplies are estimated in this spreadsheet.
Emission Estimation Method: United States Air Force (USAF) Institute for Environment, Safety and Occupational Health Risk Analysis (IERA) Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations (Revised December 2003).

Assumptions:

Haul trucks carry 20 cubic yards of material per trip.
The average distance from the project site to the materials source is 15 miles; therefore, a haul truck will travel 30 miles round trip.
Estimated number of trips required by haul trucks = total amount of material/20 cubic yards per truck

Amount of Building Materials (Above Ground) =	29,811	cubic yards	Assumes 4 feet of building material are needed
Amount of Building Materials (Below Ground) =	12,421	cubic yards	Assumes 5 feet of material are needed for the below ground portion of the facility
Amount of Excavation Material =	29,811	cubic yards	Assumes 12 feet of material would need to be excavated on average
Number of trucks required =	3602	heavy duty diesel haul truck trips	
Miles per trip =	30	miles	

Heavy Duty Diesel Vehicle (HDDV) Average Emission Factors (grams/mile)

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
HDDV	**6.5**	**4.7**	**19.1**	**0.512**	**7.73**	**2.01**	**1645.605**

Notes:

Emission factors for all pollutants except CO_2 are from USAF IERA 2003.

Emission factors for PM, PM_{10}, SO_x are from HDDV in Table 4-50 (USAF IERA 2003).

Emission factors for VOC, CO, and NO_x are from Tables 4-41 through 4-43 for the 2010 calendar year, 2000 model year (USAF IERA 2003).

Diesel fuel produces 22.384 pounds of CO2 per gallon.

It is assumed that the average HDDV has a fuel economy of 6.17 miles per gallon, Table 4-51 (USAF IERA 2003)

CO_2 emission factor = 22.384 lbs CO_2/gallon diesel * gallon diesel/6.17 miles * 453.6 g/lb

HDDV Haul Truck Emissions

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
lbs	**1548.554**	**1119.724**	**4550.368**	**121.978**	**1841.589**	**478.861**	**392047.517**
tons	**0.774**	**0.560**	**2.275**	**0.061**	**0.921**	**0.239**	**196.024**

Example Calculation: NO_x emissions (lbs) = 30 miles per trip * 369 trips * NO_x emission factor (g/mile) * lb/453.6 g

Construction Commuter Emissions

Emissions from construction workers commuting to the job site are estimated in this spreadsheet.

Emission Estimation Method: Emission factors from the South Coast Air Quality Management District (SCAQMD) EMFAC 2007 (v 2.3) Model (on-road) were used. These emission factors are available online at http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.

Assumptions:
Passenger vehicle emission factors for scenario year 2010 are used.

The average roundtrip commute for a construction worker =	30	miles
Number of construction days =	240	days
Number of construction workers (daily) =	30	people

Passenger Vehicle Emission Factors for Year 2010 (lbs/mile)

NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
0.00091814	0.00091399	0.00826276	0.00001077	0.00008698	0.00005478	1.09568235

Source: South Coast Air Quality Management District. EMFAC 2007 (ver 2.3) On-Road Emissions Factors. Last updated April 24, 2008. Available online: <http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html>. Accessed 27 May 2009.
Notes:
The SMAQMD 2007 reference lists emission factors for reactive organic gas (ROG). For purposes of this worksheet ROG = VOC.

Construction Commuter Emissions

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
lbs	**198.318**	**197.421**	**1784.755**	**2.327**	**18.787**	**11.833**	**236667.387**
tons	**0.099**	**0.099**	**0.892**	**0.001**	**0.009**	**0.006**	**118.334**

Example Calculation: NO_x emissions (lbs) = 60 miles/day * NO_x emission factor (lb/mile) * number of construction days * number of workers

Summary	Summarizes total emissions by calendar year for Construction of the LCS Training Facility at NAVSTA Norfolk
Combustion	Estimates emissions from non-road equipment exhaust.
Fugitive	Estimates particulate emissions from construction and demolition activities including earthmoving, vehicle traffic, and windblown dust.
Grading	Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions.
Haul Truck On-Road	Estimates emissions from haul trucks hauling fill materials to the job site.
Construction Commuter	Estimates emissions for construction workers commuting to the site.
Emergency Generator	Estimates emissions from the operation of emergency generators.
AQCR Tier Report	Summarizes total emissions for the Jackson-Brunswick Interstate Air Quality Control Region Tier report for 2008, to be used to compare construction of the LCS Training Facility at NAVSTA Norfolk to regional emissions.

Hampton Roads Interstate Air Quality Control Region

			All Emission Sources					
Row #	State	County/City	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC
1	VA	Isle of Wright county	6,647	2,634	2,323	899	3,271	6,185
2	VA	James City county	5,370	1,816	1,207	336	614	3,751
3	VA	Southampton county	5,457	2,075	1,945	647	412	9,535
4	VA	York county	33,090	6,727	1,157	531	24,967	5,391
5	VA	Cheapeake city	20,753	8,737	2,860	1,352	16,609	9,476
6	VA	Franklin city	577	104	206	37	11	1,288
7	VA	Hampton city	5,977	1,732	519	307	400	1,754
8	VA	Newport News city	10,799	7,344	1,264	717	1,604	2,934
9	VA	Norfolk city	14,795	10,191	1,615	940	1,458	3,126
10	VA	Poquoson city	1,284	91	41	22	10	657
11	VA	Portsmouth city	5,829	6,271	573	376	5,789	2,501
12	VA	Suffolk city	14,202	1,885	2,452	1,172	253	9,760
13	VA	Virginia Beach city	25,092	4,662	2,723	1,069	797	7,426
14	VA	Williamsburg city	1,040	131	62	26	16	881
Grand Total			150,912	54,400	18,946	8,429	56,209	64,663

SOURCE:
http://neibrowser.epa.gov/eis-public-web/home.html
USEPA National Emissions Inventory (NEI)
Emissions in tons per year for 2008

Air Emissions for Construction of the LCS Training Facility at NAVSTA Norfolk

	NO_x (ton)	VOC (ton)	CO (ton)	SO_2 (ton)	PM_{10} (ton)	$PM_{2.5}$ (ton)	CO_2 (ton)
Combustion	4.805	0.647	2.117	0.380	0.345	0.335	544.281
Fugitive Dust	-	-	-	-	2.774	0.277	-
Haul Truck On-Road	1.224	0.885	3.596	0.096	1.455	0.378	309.780
Commuter	0.099	0.099	0.892	0.001	0.009	0.006	118.334
TOTAL	***6.128***	***1.631***	***6.605***	***0.477***	***4.584***	***0.996***	***972.395***

Note: Total $PM_{10}/_{2.5}$ fugitive dust emissions are assuming USEPA 50% control efficiencies.

CO_2 emissions converted to metric tons =	***881.962***	***metric tons***	
State of Virginia's CO_2 emissions =	***106,000,000***	***metric tons***	*(U.S. DOE/EIA 2011)*
Percent of Virginia's CO_2 emissions =	***0.00083%***		
United States' CO_2 emissions =	***5,425,600,000***	***metric tons***	*(U.S. DOE/EIA 2011)*
Percent of USA's CO_2 emissions =	***0.000016%***		

Source: U.S. Department of Energy, Energy Information Administration (U.S. DOE/EIA). 2012. *Table 1. State Emissions by Year (Million Metric Tons of Carbon Dioxide).* Available online <http://www.eia.gov/environment/emissions/state/state_emissions.cfm>. Data released October 2011. Data accessed 30 July 2012.

Since future year budgets were not readily available, actual 2008 air emissions inventories for the counties were used as an approximation of the regional inventory. Because Norfolk Construction Activities (Scenario 1) is several orders of magnitude below significance, the conclusion would be the same, regardless of whether future year budget data set were used.

Hampton Roads Interstate Air Quality Control Region

	Point and Area Sources Combined					
Year	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
2008	54,400	64,663	150,912	56,209	18,946	8,429

Source: USEPA National Emissions Inventory (NEI) (http://neibrowser.epa.gov/eis-public-web/home.html). Site visited on 30 July 2012

Air Emissions from Construction of the LCS Training Facility at NAVSTA Norfolk

	Point and Area Sources Combined					
	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Regional Emissions	54,400	64,663	150,912	56,209	18,946	8,429
Emissions	6.128	1.631	6.605	0.477	4.584	0.996
% of Regional	**0.011%**	**0.0025%**	**0.004%**	**0.001%**	**0.024%**	**0.012%**

Combustion Emissions

Combustion Emissions of VOC, NO_x, SO_2, CO, $PM_{2.5}$, $PM_{10,}$ and CO_2 due to Construction and Demolition

	General Construction and Demolition Activities	**Area Disturbed**
1.)	Construct LCS Training Facility @ NAVSTA Norfolk	106,000 ft²

Total Construction Area:	106,000	ft²	Line 1
	2.43	acres	
Total Demolition Area:	0	ft²	
	0.00	acres	
Total Pavement Area:	0	ft²	Line 2
	0.00	acres	
Total Disturbed Area:	106,000	ft²	Line 1 and Line 2
	2.43	acres	
Construction Duration:	12	months	
Annual Construction Activity:	240	days	Assume 4 weeks per month, 5 days per week.

Emission Factors Used for Construction Equipment

References: Guide to Air Quality Assessment, SMAQMD, 2004; and U.S. EPA NONROAD Emissions Model, Version 2005.0.0
Emission factors are taken from the NONROAD model and were provided to e²M by Larry Landman of the Air Quality and Modeling Center (Landman.Larry@epamail.epa.gov) on 12/14/07. Factors provided are for the weighted average US fleet for CY2007.
Assumptions regarding the type and number of equipment are from SMAQMD Table 3-1 unless otherwise noted.

Grading

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Bulldozer	1	13.60	0.96	5.50	1.02	0.89	0.87	1456.90
Motor Grader	1	9.69	0.73	3.20	0.80	0.66	0.64	1141.65
Water Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Total per 10 acres of activity	3	41.64	2.58	15.71	3.45	2.55	2.47	4941.53

Paving

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Paver	1	3.83	0.37	2.06	0.28	0.35	0.34	401.93
Roller	1	4.82	0.44	2.51	0.37	0.43	0.42	536.07
Truck	2	36.71	1.79	14.01	3.27	1.99	1.93	4685.95
Total per 10 acres of activity	4	45.37	2.61	18.58	3.93	2.78	2.69	5623.96

Demolition

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Loader	1	13.45	0.99	5.58	0.95	0.93	0.90	1360.10
Haul Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Total per 10 acres of activity	2	31.81	1.89	12.58	2.58	1.92	1.87	3703.07

Building Construction

Equipment[d]	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Stationary								
Generator Set	1	2.38	0.32	1.18	0.15	0.23	0.22	213.06
Industrial Saw	1	2.62	0.32	1.97	0.20	0.32	0.31	291.92
Welder	1	1.12	0.38	1.50	0.08	0.23	0.22	112.39
Mobile (non-road)								
Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Forklift	1	5.34	0.56	3.33	0.40	0.55	0.54	572.24
Crane	1	9.57	0.66	2.39	0.65	0.50	0.49	931.93
Total per 10 acres of activity	6	39.40	3.13	17.38	3.12	2.83	2.74	4464.51

Note: Footnotes for tables are on following page

Architectural Coatings

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Air Compressor	1	3.57	0.37	1.57	0.25	0.31	0.30	359.77
Total per 10 acres of activity	1	3.57	0.37	1.57	0.25	0.31	0.30	359.77

a) The SMAQMD 2004 guidance suggests a default equipment fleet for each activity, assuming 10 acres of that activity, (e.g., 10 acres of grading, 10 acres of paving, etc.). The default equipment fleet is increased for each 10 acre increment in the size of the construction project. That is, a 26 acre project would round to 30 acres and the fleet size would be three times the default fleet for a 10 acre project.

b) The SMAQMD 2004 reference lists emission factors for reactive organic gas (ROG). For the purposes of this worksheet ROG = VOC. The NONROAD model contains emissions factors for total HC and for VOC. The factors used here are the VOC factors.

c) The NONROAD emission factors assume that the average fuel burned in nonroad trucks is 1100 ppm sulfur. Trucks that would be used for the Proposed Actions will all be fueled by highway grade diesel fuel which cannot exceed 500 ppm sulfur. These estimates therefore over-estimate SO2 emissions by more than a factor of two.

d) Typical equipment fleet for building construction was not itemized in SMAQMD 2004 guidance. The equipment list above was assumed based on SMAQMD 1994 guidance.

PROJECT-SPECIFIC EMISSION FACTOR SUMMARY

Source	Equipment Multiplier*	Project-Specific Emission Factors (lb/day)						
		NO_x	VOC	CO	SO_2**	PM_{10}	$PM_{2.5}$	CO_2
Grading Equipment	1	41.641	2.577	15.710	3.449	2.546	2.469	4941.526
Paving Equipment	1	45.367	2.606	18.578	3.926	2.776	2.693	5623.957
Demolition Equipment	1	31.808	1.886	12.584	2.585	1.923	1.865	3703.074
Building Construction	1	39.396	3.130	17.382	3.116	2.829	2.744	4464.512
Air Compressor for Architectural Coating	1	3.574	0.373	1.565	0.251	0.309	0.300	359.773
Architectural Coating**			26.534					

*The equipment multiplier is an integer that represents units of 10 acres for purposes of estimating the number of equipment required for the project.

**Emission factor is from the evaporation of solvents during painting, per "Air Quality Thresholds of Significance", SMAQMD, 1994

Example: SMAQMD Emission Factor for Grading Equipment NOx = (Total Grading NOx per 10 acre)*(Equipment Multiplier)

Summary of Input Parameters

	Total Area (ft^2)	Total Area (acres)	Total Days	
Grading:	106,000	2.43	2	(from "Grading" worksheet)
Paving:	0	0.00	0	
Demolition:	0	0.00	0	
Building Construction:	106,000	2.43	240	
Architectural Coating	106,000	2.43	20	(per SMAQMD "Air Quality of Thresholds of Significance", 1994)

NOTE: The 'Total Days' estimate for paving is calculated by dividing the total number of acres by 0.21 acres/day, which is a factor derived from the 2005 MEANS Heavy Construction Cost Data, 19th Edition, for 'Asphaltic Concrete Pavement, Lots and Driveways - 6" stone base', which provides an estimate of square feet paved per day. There is also an estimate for 'Plain Cement Concrete Pavement', however the estimate for asphalt is used because it is more conservative. The 'Total 'Days' estimate for demolition is calculated by dividing the total number of acres by 0.02 acres/day, which is a factor also derived from the 2005 MEANS reference. This is calculated by averaging the demolition estimates from 'Building Demolition - Small Buildings, Concrete', assuming a height of 30 feet for a two-story building; from 'Building Footings and Foundations Demolition - 6" Thick, Plain Concrete'; and from 'Demolish, Remove Pavement and Curb - Concrete to 6" thick, rod reinforced'. Paving is double-weighted since projects typically involve more paving demolition. The 'Total Days' estimate for building construction is assumed to be 230 days, unless project-specific data is known.

Total Project Emissions by Activity (lbs)

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Grading Equipment	83.28	5.15	31.42	6.90	5.09	4.94	9,883
Paving	-	-	-	-	-	-	0
Demolition	-	-	-	-	-	-	0
Building Construction	9,455.12	751.15	4,171.75	747.92	678.97	658.60	1,071,483
Architectural Coatings	71.48	538.15	31.31	5.02	6.19	6.00	7,195
Total Emissions (lbs):	**9,609.88**	**1,294.46**	**4,234.48**	**759.85**	**690.25**	**669.54**	**1,088,561**

Results: Total Project Annual Emission Rates

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Total Project Emissions (lbs)	9,609.88	1,294.46	4,234.48	759.85	690.25	669.54	1,088,561
Total Project Emissions (tons)	4.805	0.647	2.117	0.380	0.345	0.335	544.281

Construction Fugitive Dust Emissions

Construction Fugitive Dust Emission Factors

	Emission Factor	Units	Source
Construction and Demolition Activities	0.19	ton PM_{10}/acre-month	MRI 1996; EPA 2001; EPA 2006
New Road Construction	0.42	ton PM_{10}/acre-month	MRI 1996; EPA 2001; EPA 2006

$PM_{2.5}$ Emissions

$PM_{2.5}$ Multiplier	0.10	(10% of PM_{10} emissions assumed to be $PM_{2.5}$)	EPA 2001; EPA 2006
Control Efficiency	0.50	(assume 50% control efficiency for PM_{10} and $PM_{2.5}$ emissions)	EPA 2001; EPA 2006

Project Assumptions

New Roadway Construction (0.42 ton PM_{10}/acre-month)

Duration of Construction Project	12	months
Area	0.00	acres

General Construction and Demolition Activities (0.19 ton PM_{10}/acre-month)

Duration of Project	12	months
Area	2.43	acres

	Project Emissions (tons/year)			
	PM_{10} uncontrolled	**PM_{10} controlled**	**$PM_{2.5}$ uncontrolled**	**$PM_{2.5}$ controlled**
New Roadway Construction	0.000	0.000	0.000	0.000
General Construction Activities	5.548	2.774	0.555	0.277
Total	**5.548**	**2.774**	**0.555**	**0.277**

Construction Fugitive Dust Emission Factors

General Construction Activities Emission Factor

0.19 ton PM_{10}/acre-month Source: MRI 1996; EPA 2001; EPA 2006

The area-based emission factor for construction activities is based on a study completed by the Midwest Research Institute (MRI) Improvement of Specific Emission Factors (BACM Project No. 1), March 29, 1996. The MRI study evaluated seven construction projects in Nevada and California (Las Vegas, Coachella Valley, South Coast Air Basin, and the San Joaquin Valley). The study determined an average emission factor of 0.11 ton PM_{10}/acre-month for sites without large-scale cut/fill operations. A worst-case emission factor of 0.42 ton PM_{10}/acre-month was calculated for sites with active large-scale earth moving operations. The monthly emission factors are based on 168 work-hours per month (MRI 1996). A subsequent MRI Report in 1999, Estimating Particulate Matter Emissions From Construction Operations, calculated the 0.19 ton PM_{10}/acre-month emission factor by applying 25% of the large-scale earthmoving emission factor (0.42 ton PM_{10}/acre-month) and 75% of the average emission factor (0.11 ton PM_{10}/acre-month). The 0.19 ton PM_{10}/acre-month emission factor is referenced by the EPA for non-residential construction activities in recent procedures documents for the National Emission Inventory (EPA 2001; EPA 2006). The 0.19 ton PM_{10}/acre-month emission factor represents a refinement of EPA's original AP-42 area-based total suspended particulate (TSP) emission factor in Section 13.2.3 Heavy Construction Operations. In addition to the EPA, this methodology is also supported by the South Coast Air Quality Management District as well as the Western Regional Air Partnership (WRAP) which is funded by the EPA and is administered jointly by the Western Governor's Association and the National Tribal Environmental Council. The emission factor is assumed to encompass a variety of non-residential construction activities including building construction (commercial, industrial, institutional, governmental), public works, and travel on unpaved roads. The EPA National Emission Inventory documentation assumes that the emission factors are uncontrolled and recommends a control efficiency of 50% for PM_{10} and $PM_{2.5}$ in PM nonattainment areas.

New Road Construction Emission Factor

0.42 ton PM_{10}/acre-month Source: MRI 1996; EPA 2001; EPA 2006

The emission factor for new road construction is based on the worst-case conditions emission factor from the MRI 1996 study described above (0.42 tons PM_{10}/acre-month). It is assumed that road construction involves extensive earthmoving and heavy construction vehicle travel resulting in emissions that are higher than other general construction projects. The 0.42 ton PM10/acre-month emission factor for road construction is referenced in recent procedures documents for the EPA National Emission Inventory (EPA 2001; EPA 2006).

$PM_{2.5}$ Multiplier **0.10**

$PM_{2.5}$ emissions are estimated by applying a particle size multiplier of 0.10 to PM_{10} emissions. This methodology is consistent with the procedures documents for the National Emission Inventory (EPA 2006).

Control Efficiency for PM_{10} and $PM_{2.5}$ **0.50**

The EPA National Emission Inventory documentation recommends a control efficiency of 50% for PM_{10} and $PM_{2.5}$ in PM nonattainment areas (EPA 2006). Wetting controls will be applied during project construction.

References:

EPA 2001. *Procedures Document for National Emissions Inventory, Criteria Air Pollutants, 1985-1999.* EPA-454/R-01-006. Office of Air Quality Planning and Standards, United States Environmental Protection Agency. March 2001.

EPA 2006. *Documentation for the Final 2002 Nonpoint Sector (Feb 06 version) National Emission Inventory for Criteria and Hazardous Air Pollutants.* Prepared for: Emissions Inventory and Analysis Group (C339-02) Air Quality Assessment Division Office of Air Quality Planning and Standards, United States Environmental Protection Agency. July 2006.

MRI 1996. *Improvement of Specific Emission Factors (BACM Project No. 1).* Midwest Research Institute (MRI). Prepared for the California South Coast Air Quality Management District, March 29, 1996.

Grading Schedule

Estimate of time required to grade a specified area.

Input Parameters

Construction area: 2.43 acres/yr (from Combustion Worksheet)

Qty Equipment: 3.00 (calculated based on 3 pieces of equipment for every 10 acres)

Assumptions.

Terrain is mostly flat.

An average of 6" soil is excavated from one half of the site and backfilled to the other half of the site; no soil is hauled off-site or borrowed.

200 hp bulldozers are used for site clearing.

300 hp bulldozers are used for stripping, excavation, and backfill.

Vibratory drum rollers are used for compacting.

Stripping, Excavation, Backfill and Compaction require an average of two passes each.

Excavation and Backfill are assumed to involve only half of the site.

Calculation of days required for one piece of equipment to grade the specified area.

Reference: Means Heavy Construction Cost Data, 19th Ed., R. S. Means, 2005.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day)	equip-days per acre	Acres/yr (project-specific)	Equip-days per year
2230 200 0550	Site Clearing	Dozer & rake, medium brush	8	acre/day	8	0.13	2.43	0.30
2230 500 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	2.43	1.19
2315 432 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.99	1.01	1.22	1.23
2315 120 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	1.22	0.50
2315 310 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	2,300	cu. yd/day	2.85	0.35	2.43	0.85
TOTAL								4.08

Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 4.08

Qty Equipment: 3.00

Grading days/yr: 1.36

Haul Truck Emissions

Emissions from hauling excavation material and construction supplies are estimated in this spreadsheet.
Emission Estimation Method: United States Air Force (USAF) Institute for Environment, Safety and Occupational Health Risk Analysis (IERA) Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations (Revised December 2003).

Assumptions:
Haul trucks carry 20 cubic yards of material per trip.
The average distance from the project site to the materials source is 15 miles; therefore, a haul truck will travel 30 miles round trip.
Estimated number of trips required by haul trucks = total amount of material/20 cubic yards per truck

Amount of Building Materials (Above Ground) =	47,111	cubic yards	Assumes 4 feet of building material are needed
Amount of Building Materials (Below Ground) =	19,630	cubic yards	Assumes 5 feet of material are needed for the below ground portion of the facility
Amount of Excavation Material =	47,111	cubic yards	Assumes 12 feet of material would need to be excavated on average
Number of trucks required =	5693	heavy duty diesel haul truck trips	
Miles per trip =	30	miles	

Heavy Duty Diesel Vehicle (HDDV) Average Emission Factors (grams/mile)

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
HDDV	**6.5**	**4.7**	**19.1**	**0.512**	**7.73**	**2.01**	**1645.605**

Notes:

Emission factors for all pollutants except CO_2 are from USAF IERA 2003.

Emission factors for PM, PM_{10}, SO_x are from HDDV in Table 4-50 (USAF IERA 2003).

Emission factors for VOC, CO, and NO_x are from Tables 4-41 through 4-43 for the 2010 calendar year, 2000 model year (USAF IERA 2003).

Diesel fuel produces 22.384 pounds of CO2 per gallon.

It is assumed that the average HDDV has a fuel economy of 6.17 miles per gallon, Table 4-51 (USAF IERA 2003)

CO_2 emission factor = 22.384 lbs CO_2/gallon diesel * gallon diesel/6.17 miles * 453.6 g/lb

HDDV Haul Truck Emissions

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
lbs	**2447.212**	**1769.523**	**7191.040**	**192.765**	**2910.300**	**756.753**	**619560.742**
tons	**1.224**	**0.885**	**3.596**	**0.096**	**1.455**	**0.378**	**309.780**

Example Calculation: NO_x emissions (lbs) = 30 miles per trip * 369 trips * NO_x emission factor (g/mile) * lb/453.6 g

Construction Commuter Emissions

Emissions from construction workers commuting to the job site are estimated in this spreadsheet.

Emission Estimation Method: Emission factors from the South Coast Air Quality Management District (SCAQMD) EMFAC 2007 (v 2.3) Model (on-road) were used. These emission factors are available online at http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.

Assumptions:
Passenger vehicle emission factors for scenario year 2010 are used.

The average roundtrip commute for a construction worker =	30	miles
Number of construction days =	240	days
Number of construction workers (daily) =	30	people

Passenger Vehicle Emission Factors for Year 2010 (lbs/mile)

NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
0.00091814	0.00091399	0.00826276	0.00001077	0.00008698	0.00005478	1.09568235

Source: South Coast Air Quality Management District. EMFAC 2007 (ver 2.3) On-Road Emissions Factors. Last updated April 24, 2008. Available online: <http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html>. Accessed 27 May 2009.
Notes:
The SMAQMD 2007 reference lists emission factors for reactive organic gas (ROG). For purposes of this worksheet ROG = VOC.

Construction Commuter Emissions

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
lbs	**198.318**	**197.421**	**1784.755**	**2.327**	**18.787**	**11.833**	**236667.387**
tons	**0.099**	**0.099**	**0.892**	**0.001**	**0.009**	**0.006**	**118.334**

Example Calculation: NO_x emissions (lbs) = 60 miles/day * NO_x emission factor (lb/mile) * number of construction days * number of workers

Summary	Summarizes total emissions by calendar year for Construction of the Mission Package Support Facility at NAVSTA Norfolk
Combustion	Estimates emissions from non-road equipment exhaust.
Fugitive	Estimates particulate emissions from construction and demolition activities including earthmoving, vehicle traffic, and windblown dust.
Grading	Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions.
Haul Truck On-Road	Estimates emissions from haul trucks hauling fill materials to the job site.
Construction Commuter	Estimates emissions for construction workers commuting to the site.
Emergency Generator	Estimates emissions from the operation of emergency generators.
AQCR Tier Report	Summarizes total emissions for the Jackson-Brunswick Interstate Air Quality Control Region Tier report for 2008, to be used to compare construction of the Mission Package Support Facility at NAVSTA Norfolk to regional emissions.

Hampton Roads Interstate Air Quality Control Region

			All Emission Sources					
Row #	State	County/City	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC
1	VA	Isle of Wright county	6,647	2,634	2,323	899	3,271	6,185
2	VA	James City county	5,370	1,816	1,207	336	614	3,751
3	VA	Southampton county	5,457	2,075	1,945	647	412	9,535
4	VA	York county	33,090	6,727	1,157	531	24,967	5,391
5	VA	Cheapeake city	20,753	8,737	2,860	1,352	16,609	9,476
6	VA	Franklin city	577	104	206	37	11	1,288
7	VA	Hampton city	5,977	1,732	519	307	400	1,754
8	VA	Newport News city	10,799	7,344	1,264	717	1,604	2,934
9	VA	Norfolk city	14,795	10,191	1,615	940	1,458	3,126
10	VA	Poquoson city	1,284	91	41	22	10	657
11	VA	Portsmouth city	5,829	6,271	573	376	5,789	2,501
12	VA	Suffolk city	14,202	1,885	2,452	1,172	253	9,760
13	VA	Virginia Beach city	25,092	4,662	2,723	1,069	797	7,426
14	VA	Williamsburg city	1,040	131	62	26	16	881
Grand Total			150,912	54,400	18,946	8,429	56,209	64,663

SOURCE:
http://neibrowser.epa.gov/eis-public-web/home.html
USEPA National Emissions Inventory (NEI)

Air Emissions for Construction of the Mission Package Support Facility at NAVSTA Norfolk

	NO_x (ton)	VOC (ton)	CO (ton)	SO_2 (ton)	PM_{10} (ton)	$PM_{2.5}$ (ton)	CO_2 (ton)
Combustion	2.420	0.349	1.066	0.191	0.174	0.169	273.939
Fugitive Dust	-	-	-	-	0.483	0.048	-
Haul Truck On-Road	0.205	0.148	0.601	0.016	0.243	0.063	51.788
Commuter	0.050	0.049	0.446	0.001	0.005	0.003	59.167
TOTAL	***2.674***	***0.547***	***2.114***	***0.208***	***0.905***	***0.283***	***384.894***

Note: Total $PM_{10}/_{2.5}$ fugitive dust emissions are assuming USEPA 50% control efficiencies.

CO_2 emissions converted to metric tons =	***349.099***	***metric tons***	
State of Virginia's CO_2 emissions =	***106,000,000***	***metric tons***	*(U.S. DOE/EIA 2011)*
Percent of Virginia's CO_2 emissions =	***0.00033%***		
United States' CO_2 emissions =	***5,425,600,000***	***metric tons***	*(U.S. DOE/EIA 2011)*
Percent of USA's CO_2 emissions =	***0.000006%***		

Source: U.S. Department of Energy, Energy Information Administration (U.S. DOE/EIA). 2012. *Table 1. State Emissions by Year (Million Metric Tons of Carbon Dioxide).* Available online <http://www.eia.gov/environment/emissions/state/state_emissions.cfm>. Data released October 2011. Data accessed 30 July 2012.

Since future year budgets were not readily available, actual 2008 air emissions inventories for the counties were used as an approximation of the regional inventory. Because Norfolk Construction Activities (Scenario 1) is several orders of magnitude below significance, the conclusion would be the same, regardless of whether future year budget data set were used.

Hampton Roads Interstate Air Quality Control Region

	Point and Area Sources Combined					
Year	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
2008	54,400	64,663	150,912	56,209	18,946	8,429

Source: USEPA National Emissions Inventory (NEI) (http://neibrowser.epa.gov/eis-public-web/home.html). Site visited on 30 July 2012

Air Emissions from Construction of the Mission Package Support Facility at NAVSTA Norfolk

	Point and Area Sources Combined					
	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Regional Emissions	54,400	64,663	150,912	56,209	18,946	8,429
Emissions	2.674	0.547	2.114	0.208	0.905	0.283
% of Regional	**0.005%**	**0.0008%**	**0.001%**	**0.000%**	**0.005%**	**0.003%**

Combustion Emissions

Combustion Emissions of VOC, NO_x, SO_2, CO, $PM_{2.5}$, $PM_{10,}$ and CO_2 due to Construction and Demolition

	General Construction and Demolition Activities	**Area Disturbed**	
1.)	Construct Missions Package Support Facility @ NAVSTA Norfolk	10,800	ft²
2.)	Construct Exterior Covered Space @ Missions Package Support Facility	26,100	ft²

Total Construction Area:	36,900	ft²	Line 1
	0.85	acres	
Total Demolition Area:	0	ft²	
	0.00	acres	
Total Pavement Area:		ft²	Line 2
	0.00	acres	
Total Disturbed Area:	36,900	ft²	Line 1 and Line 2
	0.85	acres	
Construction Duration:	6	months	
Annual Construction Activity:	120	days	Assume 4 weeks per month, 5 days per week.

Emission Factors Used for Construction Equipment

References: Guide to Air Quality Assessment, SMAQMD, 2004; and U.S. EPA NONROAD Emissions Model, Version 2005.0.0
Emission factors are taken from the NONROAD model and were provided to e²M by Larry Landman of the Air Quality and Modeling Center (Landman.Larry@epamail.epa.gov) on 12/14/07. Factors provided are for the weighted average US fleet for CY2007.
Assumptions regarding the type and number of equipment are from SMAQMD Table 3-1 unless otherwise noted.

Grading

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Bulldozer	1	13.60	0.96	5.50	1.02	0.89	0.87	1456.90
Motor Grader	1	9.69	0.73	3.20	0.80	0.66	0.64	1141.65
Water Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Total per 10 acres of activity	3	41.64	2.58	15.71	3.45	2.55	2.47	4941.53

Paving

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Paver	1	3.83	0.37	2.06	0.28	0.35	0.34	401.93
Roller	1	4.82	0.44	2.51	0.37	0.43	0.42	536.07
Truck	2	36.71	1.79	14.01	3.27	1.99	1.93	4685.95
Total per 10 acres of activity	4	45.37	2.61	18.58	3.93	2.78	2.69	5623.96

Demolition

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Loader	1	13.45	0.99	5.58	0.95	0.93	0.90	1360.10
Haul Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Total per 10 acres of activity	2	31.81	1.89	12.58	2.58	1.92	1.87	3703.07

Building Construction

Equipment[d]	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Stationary								
Generator Set	1	2.38	0.32	1.18	0.15	0.23	0.22	213.06
Industrial Saw	1	2.62	0.32	1.97	0.20	0.32	0.31	291.92
Welder	1	1.12	0.38	1.50	0.08	0.23	0.22	112.39
Mobile (non-road)								
Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Forklift	1	5.34	0.56	3.33	0.40	0.55	0.54	572.24
Crane	1	9.57	0.66	2.39	0.65	0.50	0.49	931.93
Total per 10 acres of activity	6	39.40	3.13	17.38	3.12	2.83	2.74	4464.51

Note: Footnotes for tables are on following page

Architectural Coatings

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Air Compressor	1	3.57	0.37	1.57	0.25	0.31	0.30	359.77
Total per 10 acres of activity	1	3.57	0.37	1.57	0.25	0.31	0.30	359.77

a) The SMAQMD 2004 guidance suggests a default equipment fleet for each activity, assuming 10 acres of that activity, (e.g., 10 acres of grading, 10 acres of paving, etc.). The default equipment fleet is increased for each 10 acre increment in the size of the construction project. That is, a 26 acre project would round to 30 acres and the fleet size would be three times the default fleet for a 10 acre project.

b) The SMAQMD 2004 reference lists emission factors for reactive organic gas (ROG). For the purposes of this worksheet ROG = VOC. The NONROAD model contains emissions factors for total HC and for VOC. The factors used here are the VOC factors.

c) The NONROAD emission factors assume that the average fuel burned in nonroad trucks is 1100 ppm sulfur. Trucks that would be used for the Proposed Actions will all be fueled by highway grade diesel fuel which cannot exceed 500 ppm sulfur. These estimates therefore over-estimate SO2 emissions by more than a factor of two.

d) Typical equipment fleet for building construction was not itemized in SMAQMD 2004 guidance. The equipment list above was assumed based on SMAQMD 1994 guidance.

PROJECT-SPECIFIC EMISSION FACTOR SUMMARY

Source	Equipment Multiplier*	Project-Specific Emission Factors (lb/day)						
		NO_x	VOC	CO	SO_2**	PM_{10}	$PM_{2.5}$	CO_2
Grading Equipment	1	41.641	2.577	15.710	3.449	2.546	2.469	4941.526
Paving Equipment	1	45.367	2.606	18.578	3.926	2.776	2.693	5623.957
Demolition Equipment	1	31.808	1.886	12.584	2.585	1.923	1.865	3703.074
Building Construction	1	39.396	3.130	17.382	3.116	2.829	2.744	4464.512
Air Compressor for Architectural Coating	1	3.574	0.373	1.565	0.251	0.309	0.300	359.773
Architectural Coating**			15.656					

*The equipment multiplier is an integer that represents units of 10 acres for purposes of estimating the number of equipment required for the project.

**Emission factor is from the evaporation of solvents during painting, per "Air Quality Thresholds of Significance", SMAQMD, 1994

Example: SMAQMD Emission Factor for Grading Equipment NOx = (Total Grading NOx per 10 acre)*(Equipment Multiplier)

Summary of Input Parameters

	Total Area (ft^2)	Total Area (acres)	Total Days	
Grading:	36,900	0.85	1	(from "Grading" worksheet)
Paving:	0	0.00	0	
Demolition:	0	0.00	0	
Building Construction:	36,900	0.85	120	
Architectural Coating	36,900	0.85	20	(per SMAQMD "Air Quality of Thresholds of Significance", 1994)

NOTE: The 'Total Days' estimate for paving is calculated by dividing the total number of acres by 0.21 acres/day, which is a factor derived from the 2005 MEANS Heavy Construction Cost Data, 19th Edition, for 'Asphaltic Concrete Pavement, Lots and Driveways - 6" stone base', which provides an estimate of square feet paved per day. There is also an estimate for 'Plain Cement Concrete Pavement', however the estimate for asphalt is used because it is more conservative. The 'Total 'Days' estimate for demolition is calculated by dividing the total number of acres by 0.02 acres/day, which is a factor also derived from the 2005 MEANS reference. This is calculated by averaging the demolition estimates from 'Building Demolition - Small Buildings, Concrete', assuming a height of 30 feet for a two-story building; from 'Building Footings and Foundations Demolition - 6" Thick, Plain Concrete'; and from 'Demolish, Remove Pavement and Curb - Concrete to 6" thick, rod reinforced'. Paving is double-weighted since projects typically involve more paving demolition. The 'Total Days' estimate for building construction is assumed to be 230 days, unless project-specific data is known.

Total Project Emissions by Activity (lbs)

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Grading Equipment	41.64	2.58	15.71	3.45	2.55	2.47	4,942
Paving	-	-	-	-	-	-	0
Demolition	-	-	-	-	-	-	0
Building Construction	4,727.56	375.58	2,085.88	373.96	339.49	329.30	535,741
Architectural Coatings	71.48	320.58	31.31	5.02	6.19	6.00	7,195
Total Emissions (lbs):	**4,840.68**	**698.73**	**2,132.90**	**382.43**	**348.22**	**337.77**	**547,878**

Results: Total Project Annual Emission Rates

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Total Project Emissions (lbs)	4,840.68	698.73	2,132.90	382.43	348.22	337.77	547,878
Total Project Emissions (tons)	2.420	0.349	1.066	0.191	0.174	0.169	273.939

Construction Fugitive Dust Emissions

Construction Fugitive Dust Emission Factors

	Emission Factor	Units	Source
Construction and Demolition Activities	0.19	ton PM_{10}/acre-month	MRI 1996; EPA 2001; EPA 2006
New Road Construction	0.42	ton PM_{10}/acre-month	MRI 1996; EPA 2001; EPA 2006

$PM_{2.5}$ Emissions

$PM_{2.5}$ Multiplier	0.10	(10% of PM_{10} emissions assumed to be $PM_{2.5}$)	EPA 2001; EPA 2006
Control Efficiency	0.50	(assume 50% control efficiency for PM_{10} and $PM_{2.5}$ emissions)	EPA 2001; EPA 2006

Project Assumptions

New Roadway Construction (0.42 ton PM_{10}/acre-month)

Duration of Construction Project	6	months
Area	0.00	acres

General Construction and Demolition Activities (0.19 ton PM_{10}/acre-month)

Duration of Project	6	months
Area	0.85	acres

	Project Emissions (tons/year)			
	PM_{10} uncontrolled	**PM_{10} controlled**	**$PM_{2.5}$ uncontrolled**	**$PM_{2.5}$ controlled**
New Roadway Construction	0.000	0.000	0.000	0.000
General Construction Activities	0.966	0.483	0.097	0.048
Total	**0.966**	**0.483**	**0.097**	**0.048**

Construction Fugitive Dust Emission Factors

General Construction Activities Emission Factor

0.19 ton PM_{10}/acre-month Source: MRI 1996; EPA 2001; EPA 2006

The area-based emission factor for construction activities is based on a study completed by the Midwest Research Institute (MRI) Improvement of Specific Emission Factors (BACM Project No. 1), March 29, 1996. The MRI study evaluated seven construction projects in Nevada and California (Las Vegas, Coachella Valley, South Coast Air Basin, and the San Joaquin Valley). The study determined an average emission factor of 0.11 ton PM_{10}/acre-month for sites without large-scale cut/fill operations. A worst-case emission factor of 0.42 ton PM_{10}/acre-month was calculated for sites with active large-scale earth moving operations. The monthly emission factors are based on 168 work-hours per month (MRI 1996). A subsequent MRI Report in 1999, Estimating Particulate Matter Emissions From Construction Operations, calculated the 0.19 ton PM_{10}/acre-month emission factor by applying 25% of the large-scale earthmoving emission factor (0.42 ton PM_{10}/acre-month) and 75% of the average emission factor (0.11 ton PM_{10}/acre-month). The 0.19 ton PM_{10}/acre-month emission factor is referenced by the EPA for non-residential construction activities in recent procedures documents for the National Emission Inventory (EPA 2001; EPA 2006). The 0.19 ton PM_{10}/acre-month emission factor represents a refinement of EPA's original AP-42 area-based total suspended particulate (TSP) emission factor in Section 13.2.3 Heavy Construction Operations. In addition to the EPA, this methodology is also supported by the South Coast Air Quality Management District as well as the Western Regional Air Partnership (WRAP) which is funded by the EPA and is administered jointly by the Western Governor's Association and the National Tribal Environmental Council. The emission factor is assumed to encompass a variety of non-residential construction activities including building construction (commercial, industrial, institutional, governmental), public works, and travel on unpaved roads. The EPA National Emission Inventory documentation assumes that the emission factors are uncontrolled and recommends a control efficiency of 50% for PM_{10} and $PM_{2.5}$ in PM nonattainment areas.

New Road Construction Emission Factor

0.42 ton PM_{10}/acre-month Source: MRI 1996; EPA 2001; EPA 2006

The emission factor for new road construction is based on the worst-case conditions emission factor from the MRI 1996 study described above (0.42 tons PM_{10}/acre-month). It is assumed that road construction involves extensive earthmoving and heavy construction vehicle travel resulting in emissions that are higher than other general construction projects. The 0.42 ton PM10/acre-month emission factor for road construction is referenced in recent procedures documents for the EPA National Emission Inventory (EPA 2001; EPA 2006).

$PM_{2.5}$ Multiplier **0.10**

$PM_{2.5}$ emissions are estimated by applying a particle size multiplier of 0.10 to PM_{10} emissions. This methodology is consistent with the procedures documents for the National Emission Inventory (EPA 2006).

Control Efficiency for PM_{10} and $PM_{2.5}$ **0.50**

The EPA National Emission Inventory documentation recommends a control efficiency of 50% for PM_{10} and $PM_{2.5}$ in PM nonattainment areas (EPA 2006). Wetting controls will be applied during project construction.

References:

EPA 2001. *Procedures Document for National Emissions Inventory, Criteria Air Pollutants, 1985-1999.* EPA-454/R-01-006. Office of Air Quality Planning and Standards, United States Environmental Protection Agency. March 2001.

EPA 2006. *Documentation for the Final 2002 Nonpoint Sector (Feb 06 version) National Emission Inventory for Criteria and Hazardous Air Pollutants.* Prepared for: Emissions Inventory and Analysis Group (C339-02) Air Quality Assessment Division Office of Air Quality Planning and Standards, United States Environmental Protection Agency. July 2006.

MRI 1996. *Improvement of Specific Emission Factors (BACM Project No. 1).* Midwest Research Institute (MRI). Prepared for the California South Coast Air Quality Management District, March 29, 1996.

Grading Schedule

Estimate of time required to grade a specified area.

Input Parameters

Construction area: 0.85 acres/yr (from Combustion Worksheet)

Qty Equipment: 3.00 (calculated based on 3 pieces of equipment for every 10 acres)

Assumptions.

Terrain is mostly flat.
An average of 6" soil is excavated from one half of the site and backfilled to the other half of the site; no soil is hauled off-site or borrowed.
200 hp bulldozers are used for site clearing.
300 hp bulldozers are used for stripping, excavation, and backfill.
Vibratory drum rollers are used for compacting.
Stripping, Excavation, Backfill and Compaction require an average of two passes each.
Excavation and Backfill are assumed to involve only half of the site.

Calculation of days required for one piece of equipment to grade the specified area.

Reference: Means Heavy Construction Cost Data, 19th Ed., R. S. Means, 2005.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day)	equip-days per acre	Acres/yr (project-specific)	Equip-days per year
2230 200 0550	Site Clearing	Dozer & rake, medium brush	8	acre/day	8	0.13	0.85	0.11
2230 500 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	0.85	0.41
2315 432 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.99	1.01	0.42	0.43
2315 120 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	0.42	0.18
2315 310 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	2,300	cu. yd/day	2.85	0.35	0.85	0.30
TOTAL								1.42

Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 1.42
Qty Equipment: 3.00
Grading days/yr: 0.47

Haul Truck Emissions

Emissions from hauling excavation material and construction supplies are estimated in this spreadsheet.
Emission Estimation Method: United States Air Force (USAF) Institute for Environment, Safety and Occupational Health Risk Analysis (IERA) Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations (Revised December 2003).

Assumptions:
Haul trucks carry 20 cubic yards of material per trip.
The average distance from the project site to a materials source is 15 miles; therefore, a haul truck will travel 30 miles round trip.
Estimated number of trips required by haul trucks = total amount of material/20 cubic yards per truck

Amount of Building Materials (Above Ground) =	3,533	cubic yards	Assumes 4 feet of building material are needed for the building and 2 feet of building material are needed for exterior covered space
Amount of Building Materials (Below Ground) =	4,900	cubic yards	Assumes 5 feet of material are needed for the below ground portion of the facility and 3 feet of material are needed for exterior covered space
Amount of Excavation Material =	10,600	cubic yards	Assumes 12 feet of material would need to be excavated on average for the building and 6 feet of material would need to be excavated on average for the exterior covered space
Number of trucks required =	952	heavy duty diesel haul truck trips	
Miles per trip =	30	miles	

Heavy Duty Diesel Vehicle (HDDV) Average Emission Factors (grams/mile)

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
HDDV	**6.5**	**4.7**	**19.1**	**0.512**	**7.73**	**2.01**	**1645.605**

Notes:
Emission factors for all pollutants except CO_2 are from USAF IERA 2003.
Emission factors for PM, PM_{10}, SO_x are from HDDV in Table 4-50 (USAF IERA 2003).
Emission factors for VOC, CO, and NO_x are from Tables 4-41 through 4-43 for the 2010 calendar year, 2000 model year (USAF IERA 2003).
Diesel fuel produces 22.384 pounds of CO2 per gallon.
It is assumed that the average HDDV has a fuel economy of 6.17 miles per gallon, Table 4-51 (USAF IERA 2003)
CO_2 emission factor = 22.384 lbs CO_2/gallon diesel * gallon diesel/6.17 miles * 453.6 g/lb

HDDV Haul Truck Emissions

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
lbs	**409.116**	**295.822**	**1202.172**	**32.226**	**486.533**	**126.511**	**103575.883**
tons	**0.205**	**0.148**	**0.601**	**0.016**	**0.243**	**0.063**	**51.788**

Example Calculation: NO_x emissions (lbs) = 30 miles per trip * 369 trips * NO_x emission factor (g/mile) * lb/453.6 g

Construction Commuter Emissions

Emissions from construction workers commuting to the job site are estimated in this spreadsheet.

Emission Estimation Method: Emission factors from the South Coast Air Quality Management District (SCAQMD) EMFAC 2007 (v 2.3) Model (on-road) were used. These emission factors are available online at http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.

Assumptions:
Passenger vehicle emission factors for scenario year 2010 are used.

The average roundtrip commute for a construction worker =	30	miles
Number of construction days =	120	days
Number of construction workers (daily) =	30	people

Passenger Vehicle Emission Factors for Year 2010 (lbs/mile)

NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
0.00091814	0.00091399	0.00826276	0.00001077	0.00008698	0.00005478	1.09568235

Source: South Coast Air Quality Management District. EMFAC 2007 (ver 2.3) On-Road Emissions Factors. Last updated April 24, 2008. Available online: <http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html>. Accessed 27 May 2009.
Notes:
The SMAQMD 2007 reference lists emission factors for reactive organic gas (ROG). For purposes of this worksheet ROG = VOC.

Construction Commuter Emissions

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
lbs	**99.159**	**98.711**	**892.378**	**1.164**	**9.394**	**5.916**	**118333.694**
tons	**0.050**	**0.049**	**0.446**	**0.001**	**0.005**	**0.003**	**59.167**

Example Calculation: NO_x emissions (lbs) = 60 miles/day * NO_x emission factor (lb/mile) * number of construction days * number of workers

Hampton Roads Interstate Air Quality Control Region

			All Emission Sources					
Row #	State	County/City	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC
1	VA	Isle of Wright county	6,647	2,634	2,323	899	3,271	6,185
2	VA	James City county	5,370	1,816	1,207	336	614	3,751
3	VA	Southampton county	5,457	2,075	1,945	647	412	9,535
4	VA	York county	33,090	6,727	1,157	531	24,967	5,391
5	VA	Cheapeake city	20,753	8,737	2,860	1,352	16,609	9,476
6	VA	Franklin city	577	104	206	37	11	1,288
7	VA	Hampton city	5,977	1,732	519	307	400	1,754
8	VA	Newport News city	10,799	7,344	1,264	717	1,604	2,934
9	VA	Norfolk city	14,795	10,191	1,615	940	1,458	3,126
10	VA	Poquoson city	1,284	91	41	22	10	657
11	VA	Portsmouth city	5,829	6,271	573	376	5,789	2,501
12	VA	Suffolk city	14,202	1,885	2,452	1,172	253	9,760
13	VA	Virginia Beach city	25,092	4,662	2,723	1,069	797	7,426
14	VA	Williamsburg city	1,040	131	62	26	16	881
Grand Total			150,912	54,400	18,946	8,429	56,209	64,663

SOURCE:
http://neibrowser.epa.gov/eis-public-web/home.html
USEPA National Emissions Inventory (NEI)

Littoral Combat Ship (LCS) Mission Support Personnel Commuter Emissions

Emissions from LCS mission support personnel commuting to MCAS Cherry Point are estimated in this spreadsheet.

For the purposes of this EA, it is assumed that up to an additional 30 personnel would be stationed at MCAS Cherry Point Mayport.

Emission Estimation Method: Emission factors from the South Coast Air Quality Management District (SCAQMD) EMFAC 2007 (v 2.3) Model (on-road) were used. These emission factors are available online at http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.

Assumptions:

Passenger vehicle emission factors for scenario year 2013 are used.

The average roundtrip commute for LCS mission support personnel =	25	miles
Number of LCS mission days =	250	days
Number of LCS mission support personnel (daily) =	30	people

Passenger Vehicle Emission Factors for Year 2013 (lbs/mile)

NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
0.00071158	0.00074567	0.00709228	0.00001072	0.00009067	0.00005834	1.10087435

Source: South Coast Air Quality Management District. EMFAC 2007 (ver 2.3) On-Road Emissions Factors. Last updated 24 April 2008. Available online: <http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html>. Accessed 7 June 2010.
Notes:
The SMAQMD 2007 reference lists emission factors for reactive organic gas (ROG). For purposes of this worksheet ROG = VOC.

LCS Mission Support Personnel Commuter Emissions Per Year

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
lbs	**133.42**	**139.81**	**1,329.80**	**2.01**	**17.00**	**10.94**	**206,413.94**
tons	**0.07**	**0.07**	**0.66**	**0.00**	**0.01**	**0.01**	**103.21**

Example Calculation: NO_x emissions (lbs) = 60 miles/day * NO_x emission factor (lb/mile) * number of construction days * number of personnel.

Annual Emissions from Firescout Test Flight Operations

Conditions and Assumptions:

360 individual test flights per year; 30 minutes per test flight or 180 hours per year operations.
Assume test flights operate at 50% full power for half of the time and 100% full power the other half of the time.
Information from http://www.naval-technology.com/projects/firescout/ website indicates the Firescout has a 480 shaft horsepower engine.
Without specific emission factors available for this engine, we assumed emission factors would be comparable to diesel
stationary internal combustion emission factors provided in AP-42, Section 3.3.

Emissions Factors (lbs/hp-hr)

NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
0.031	2.47E-03	6.68E-03	2.05E-03	2.20E-03	2.20E-03	1.15

Annual Emissions (tons/yr)

NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
1.004	0.08	0.216	0.066	0.071	0.071	37.26

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APPENDIX C

COASTAL CONSISTENCY DETERMINATION FOR NAVSTA MAYPORT

DEPARTMENT OF THE NAVY
COMMANDER NAVY REGION SOUTHEAST
BOX 102, NAVAL AIR STATION
JACKSONVILLE, FLORIDA 32212-0102

5090
N45/108
21 Mar 13

Florida Coastal Management Program
Department of Environmental Protection
Attn: Ms. Kelly Samek
3900 Commonwealth Boulevard
Douglas Building, Mail Station 47
Tallahassee, FL 32399-3000

Dear Ms. Samek:

SUBJECT: COASTAL CONSISTENCY DETERMINATION FOR THE PROPOSED EAST COAST HOMEPORTING OF THE LITTORAL COMBAT SHIP AT NAVAL STATION MAYPORT, FLORIDA

The Navy has prepared a Draft Environmental Assessment (EA) to assess the potential environmental impacts that may result from the proposed East Coast homeporting of the Littoral Combat Ship (LCS) at Naval Station Mayport, Florida. In accordance with the Coastal Zone Management Act (16 United States Code [U.S.C.] § 1456(c) and 15 Code of Federal Regulations [C.F.R.] Part 930 Subpart C), the United States Department of the Navy (Navy) requests concurrence with its Federal Consistency Determination.

The Draft EA contains detailed information and analysis of potential impacts. The Navy has reviewed Florida's Coastal Management Program in order to prepare this consistency determination. Based on the analysis, the Navy has determined the Proposed Action is consistent with Florida's Coastal Management Program. A copy of the draft EA can be viewed at the following website:

https://portal.navfac.navy.mil/portal/page/portal/navfac/navfac_ww_pp/navfac_navfacmidlant_pp/midlant_ps/environmental_norfolk/tab3987837/public%20draft%20ea%20lcs%20east%20coast%20_022713-revised.pdf

In accordance with 15 CFR 930.36, the Navy requests concurrence with this determination. The Navy consistency determination is provided as enclosure (1). Please provide your response within 60 days of receiving this letter.

We look forward to your timely review of and concurrence with the Navy's determination. If you need any additional information or have questions regarding this letter, my point of contact is Mr. W. Brock Durig, Senior Environmental Planner at commercial (904)542-6827 or email: william.durig@navy.mil.

Sincerely,

C. R. DESTAFNEY, PE
Regional Environmental Director
By direction of the Commander

Enclosure: 1. Federal Consistency Determination

Copy to:
Commanding Officer, Naval Station Mayport
U.S. Fleet Forces Command (N465)

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

MARJORY STONEMAN DOUGLAS BUILDING
3900 COMMONWEALTH BOULEVARD
TALLAHASSEE, FLORIDA 32399-3000

RICK SCOTT
GOVERNOR

HERSCHEL T. VINYARD JR.
SECRETARY

May 23, 2013

Ms. Camille R. Destafney, P.E.
Regional Environmental Director
Commander Navy Region Southeast
P.O. Box 102
NAS Jacksonville, FL 32212-0102

RE: Department of the Navy – Draft Environmental Assessment Addressing the Homeporting of the Littoral Combat Ship on the East Coast of the United States, Naval Station Mayport – Jacksonville, Duval County, Florida.
SAI # FL201303286557C

Dear Ms. Destafney:

The Florida State Clearinghouse has coordinated a review of the referenced Draft Environmental Assessment (EA) under the following authorities: Presidential Executive Order 12372; Section 403.061(42), *Florida Statutes*; the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended; and the National Environmental Policy Act, 42 U.S.C. §§ 4321-4347, as amended.

The Florida Department of Environmental Protection's (DEP) Northeast District Office in Jacksonville has reviewed the Draft EA and offers the following comments:

- The DEP's Potable Water Program notes that the Draft EA predicts that completion of the project will result in a population increase of approximately 3,600. The Naval Station (NAVSTA) Mayport water treatment plant is currently permitted for 5.7 MGD. Information in the Draft EA, however, states that the water treatment plant is permitted to treat 10 MGD, which is likely the consumptive use permit (CUP) limit from the St. Johns River Water Management District (SJRWMD). Staff recommends that the current CUP limit be confirmed with the SJRWMD.

- The additional population will increase the bacteriological sampling requirement from 20 to 25 samples per month at the plant. NAVSTA Mayport will also need to apply for drinking water distribution system permits to connect the proposed new buildings on site. For additional information, please contact Ms. Blanche Waller, P.E., at (904) 256-1607.

DEP's Division of Waste Management, Waste Cleanup Program staff also note the following:

- The information contained in the Draft EA pertaining to the Solid Waste Management Units (SWMUs), Areas of Concern (AOCs), and petroleum sites in the construction areas is accurate. Please note, however, that Waste Cleanup staff has updated data and information on the SWMUs and petroleum sites (*i.e.*, SWMU 23 Corrective Measure Implementation Plan and the DEP's response to a 2011 monitoring report for SWMUs 1-7, 14, 15, 22-25, and

AOC C, which contains a path forward for each SWMU and for AOC C) that may be useful to the Navy.

- If any monitoring wells need to be abandoned during facilities construction, a permit will be required from the SJRWMD. Please also coordinate with the NAVSTA Mayport Environmental Division and/or the NAVSTA Mayport Partnering Team prior to abandonment of any monitoring or injection well, in case it is still in use.

- When at all possible and practicable, please coordinate with the following groups during the demolition and construction project:

  1) Cheryl L. Mitchell, Environmental Director, NAVSTA Mayport Environmental Division, Public Works Office;

  2) Robbie Darby, P.E., Environmental Restoration Program Head, NAVFAC Southeast; and

  3) The NAVSTA Mayport Partnering Team (NAVSTA Mayport facility representative Paul Malewicki, NAVFAC Southeast representative Dana Hayworth, the DEP's representative John Winters and associated consultants). Communication and coordination will be important during and throughout this project.

- In the event of a spill, there may be reporting required under the hazardous waste operating permit. Please note that this permit must be renewed in November 2013, therefore, specific requirements of that permit are not available at this time.

- The Draft EA indicates that the Mission Module Readiness Center (MMRC) will not be completed in time for homeporting, so a temporary MMRC Annex will be required. During the construction of the permanent MMRC on SWMU 23, soils may need to be moved or removed. Because the soils at the SWMU are contaminated, if soils are moved or removed, the Navy will need to comply with Land Use Controls and possible hazardous waste permit conditions (*e.g.*, notifications that the SWMUs are going to be disturbed). DEP guidance is also available for the management of contaminated media on the following webpage: http://www.dep.state.fl.us/waste/quick_topics/publications/shw/hazardous/ManagementContaminatedMedia.pdf

- Although text on page 3-82, identifies NAVSTA as a large quantity generator (LQG) of hazardous waste, this section does not mention that NAVSTA is also a permitted hazardous waste storage facility. NAVSTA Mayport may need to evaluate the capacity of their permitted storage building for anticipated additional wastes from the ships. Additionally, it is probable that wastes are not "disposed of" at NAVSTA Mayport, as stated at the bottom of page 3-81. Disposal has a very specific meaning. It is likely that the sentence should have read, "Wastes generated and managed at NAVSTA Mayport include waste oils, fuels.…"

If you require additional clarification or assistance, please contact Mr. John Winters, P.G., Remedial Project Manager for NAVSTA Mayport in the DEP Bureau of Waste Cleanup, Federal Programs Section at (850) 245-8999 or John.Winters@dep.state.fl.us.

The Florida Fish and Wildlife Conservation Commission (FWC) notes that the Draft EA adequately recognizes the importance of the area as vital habitat for nesting and foraging sea turtles, but does not

address the potential indirect effects of the proposed activities at NAVSTA Mayport. While no direct impacts from construction activities are proposed, additional conservation measures associated with proposed facilities and structures are recommended to minimize indirect impacts. The FWC recommends that any project involving new exterior lighting or changes to existing exterior lighting be assessed by NAVSTA Mayport Environmental Division staff and included in or designed according to the base's proposed Light Management Plan as a more comprehensive approach to light management and sea turtle protection and conservation. Lighting on construction equipment must also be minimized to avoid excessive illumination of the nearby sea turtle nesting beach to the greatest extent practicable. For further information, please refer to the enclosed FWC letter and contact Ms. Kelly Roberts at (850) 922-4330 or Kelly.Roberts@MyFWC.com.

The Florida Department of State (DOS) has reviewed the cultural resource sections of the Draft EA and notes that the proposed undertaking will consist of the demolition of six buildings and construction of three new facilities. Since the DOS does not have sufficient information to determine the eligibility of the six buildings for listing in the *National Register of Historic Places*, staff requests additional information on each building proposed for demolition and the three new construction sites. Please refer to the enclosed DOS letter for additional information.

Based on the information contained in the Draft EA and enclosed state agency comments, at this stage, the state concurs with the Navy's determination that the activities proposed are consistent with the enforceable policies of the Florida Coastal Management Program (FCMP). The state's continued concurrence will be based on the activities' continued compliance with FCMP authorities, including federal and state monitoring to ensure said sustained compliance, and the adequate resolution of issues identified during this and subsequent reviews. The state's final concurrence of the project's consistency with the FCMP will be determined during the environmental permitting process, in accordance with Section 373.428, *Florida Statutes*, and applicable regulations at 15 C.F.R. 930.

Thank you for the opportunity to review the proposed project. Should you have any questions regarding this letter, please contact Ms. Suzanne E. Ray at (850) 245-2172.

Yours sincerely,

Sally B. Mann, Director
Office of Intergovernmental Programs

SBM/ser
Enclosures

cc: Sheena Chin-Greene, DEP, Northeast District
John Winters, DEP, DWM
Scott Sanders, FWC
Timothy Parsons, DOS

Project Information	
Project:	FL201303286557C
Comments Due:	05/02/2013
Letter Due:	05/24/2013
Description:	DEPARTMENT OF THE NAVY - DRAFT ENVIRONMENTAL ASSESSMENT ADDRESSING THE HOMEPORTING OF THE LITTORAL COMBAT SHIP ON THE EAST COAST OF THE UNITED STATES, NAVAL STATION MAYPORT - JACKSONVILLE, DUVAL COUNTY, FLORIDA.
Keywords:	NAVY - DEA, EAST COAST HOMEPORTING LITTORAL COMBAT SHIP, NAVAL STATION MAYPORT
CFDA #:	99.300

Agency Comments:

STATE - FLORIDA DEPARTMENT OF STATE

The DOS has reviewed the cultural resource sections of the draft EA and notes that the proposed undertaking will consist of the demolition of six buildings and construction of three new facilities. Since the DOS does not have sufficient information to determine the eligibility of the six buildings for listing in the National Register of Historic Places, staff requests additional information on each building proposed for demolition and the three new construction sites. For further information and assistance, please refer to the enclosed DOS letter and contact Mr. Scott Edwards at Scott.Edwards@dos.myflorida.com or (850) 245-6333.

DUVAL - DUVAL COUNTY

No Comments

TRANSPORTATION - FLORIDA DEPARTMENT OF TRANSPORTATION

FDOT's Seaport Office and District Two have no comments.

ENVIRONMENTAL PROTECTION - FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

The DEP Northeast District Office in Jacksonville offers the following comments: - The DEP's Potable Water Program notes that the Draft EA predicts that completion of the project will result in a population increase of approximately 3,600. The NAVSTA Mayport water treatment plant is currently permitted for 5.7 MGD. Information in the Draft EA, however, states that the water treatment plant is permitted to treat 10 MGD, which is likely the CUP limit from the SJRWMD. Staff recommends that the current CUP limit be confirmed with the SJRWMD. - The additional population will increase the bacteriological sampling requirement from 20 to 25 samples per month at the plant. NAVSTA Mayport will also need to apply for drinking water distribution system permits to connect the proposed new buildings on site. For additional information, please contact Ms. Blanche Waller, P.E., at (904) 256-1607. DEP Division of Waste Management, Waste Cleanup Program staff also note the following: - The information contained in the Draft EA pertaining to the SWMUs, AOCs and petroleum sites in the construction areas is accurate. Please note, however, that Waste Cleanup staff has updated data and information on the SWMUs and petroleum sites that may be useful to the Navy. - If any monitoring wells need to be abandoned during facilities construction, a permit will be required from the SJRWMD. Please also coordinate with the NAVSTA Mayport Environmental Division and/or the NAVSTA Mayport Partnering Team prior to abandonment of any monitoring or injection well, in case it is still in use. If you require additional clarification or assistance, please contact Mr. John Winters, P.G., Remedial Project Manager for NAVSTA Mayport in the DEP Bureau of Waste Cleanup, Federal Programs Section at (850) 245-8999 or John.Winters@dep.state.fl.us.

NE FLORIDA RPC - NORTHEAST FLORIDA REGIONAL PLANNING COUNCIL

The NEFRC indicates that council staff reviewed the Draft EA and has no comments at this time.

FISH and WILDLIFE COMMISSION - FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
The FWC notes that the draft EA adequately recognizes the importance of the area as vital habitat for nesting and foraging sea turtles, but does not address the potential indirect effects of the proposed activities at Naval Station Mayport. While no direct impacts from construction activities are proposed, additional conservation measures associated with proposed facilities and structures are recommended to minimize indirect impacts. FWC recommends that any project involving new exterior lighting or changes to existing exterior lighting be assessed by Naval Station Mayport Environmental Division staff and included in or designed according to the base's proposed Light Management Plan as a more comprehensive approach to light management and sea turtle protection and conservation. Lighting on construction equipment must also be minimized to avoid excessive illumination of the nearby sea turtle nesting beach to the greatest extent practicable. For further information, please refer to the enclosed FWC letter and contact Ms. Kelly Roberts at (850) 922-4330 or Kelly.Roberts@MyFWC.com.
ST. JOHNS RIVER WMD - ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
SJRWMD does not have any comments.

For more information or to submit comments, please contact the Clearinghouse Office at:

3900 COMMONWEALTH BOULEVARD, M.S. 47
TALLAHASSEE, FLORIDA 32399-3000
TELEPHONE: (850) 245-2161
FAX: (850) 245-2190

Visit the Clearinghouse Home Page to query other projects.

Northeast Florida Regional Council

Bringing Communities Together

Baker • Clay • Duval • Flagler • Nassau • Putnam • St. Johns

April 29, 2013

Lauren P. Milligan
Florida State Clearinghouse
Florida Department of Environmental Protection
3900 Commonwealth Boulevard, MS 47
Tallahassee, Florida 32399-3000

SAI # FL201303286557C
NEFRC # FSC-13-D002

Project Description: Department of the Navy, Draft Environmental Assessment Addressing the Homeporting of the Littoral Combat Ship on the East Coast of the United States, Naval Station Mayport - Jacksonville, Duval County, Florida.

Attn: Florida State Clearinghouse

Pursuant to the provisions of Presidential Executive Order 12372, Governor's Executive Order 95-359 and Chapter 29E-6 Florida Administrative Code, the staff of the Northeast Florida Regional Council (NEFRC) has reviewed the Draft Environmental Assessment for Naval Station Mayport. After review, staff at the Northeast Florida Regional Council has no comments at this time.

All the best,

Eric B. Anderson

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May 1, 2013

Ms. Lauren P. Milligan
Department of Environmental Protection
Florida State Clearinghouse
3900 Commonwealth Boulevard, M.S. 47
Tallahassee, FL 32399-3000
Lauren.Milligan@dep.state.fl.us

RE: SAI # FL201303286557C, Department of the Navy – Draft Environmental Assessment Addressing the Homeporting of the Littoral Combat Ship on the East Coast of the United States, Naval Station Mayport, Jacksonville, Duval County

Dear Ms. Milligan:

The Florida Fish and Wildlife Conservation Commission (FWC), Imperiled Species Management Section, has coordinated our agency's review of the Draft Environmental Assessment (DEA) addressing the homeporting of the littoral combat ship on the east coast of the United States. We are providing the following input under the National Environmental Policy Act, the Fish and Wildlife Coordination Act, and the Coastal Zone Management Act/Florida Coastal Management Program (CZMA/FCMP).

A number of alternatives were considered and discussed in the provided document, including a no-action alternative. The Preferred Alternative, includes the homeport to be located at Naval Station (NAVSTA) Mayport in Duval County, Florida. We are providing the following comments relative to sea turtle concerns not addressed in the DEA. In general, we find that the DEA adequately recognizes the importance of the area as vital habitat for nesting and foraging sea turtles, however, it was concluded that because construction would not occur near sea turtle nesting habitat, there would be no significant impact on sea turtles. While there may be no direct impact related to construction activities, because this area supports vital nesting habitat during the period of May 1 through October 31, additional conservation measures associated with temporary construction and permanent exterior lighting associated with proposed facilities and structures are recommended to minimize potential impacts.

It is our understanding that Trish Loop, with the NAVSTA Mayport Environmental Department, currently works to manage exterior lighting that is directly visible from the beach and is currently developing a Light Management Plan (LMP) for the base. FWC recommends that any project involving new exterior lighting or changes to existing exterior lighting be assessed by NAVSTA Mayport Environmental Department and included in or designed according to the LMP as a more comprehensive approach to light management and sea turtle protection and conservation.

At a minimum, we recommend that the following protective measures be incorporated into the final Environmental Assessment and any subsequent planning and permitting documents.

Project Lighting for Sea Turtle Protection:

1. ***Construction Lighting***. Lighting on equipment shall be minimized through reduction, shielding, lowering, and appropriate placement to avoid excessive illumination of the nearby sea turtle nesting beach to the greatest extent possible, while still meeting human safety requirements.

2. ***Development Project Lighting***. To minimize impacts to nearby sea turtle nesting beaches, all permanent exterior lighting fixtures associated with the development should be assessed by NAVSTA Mayport Environmental Department and designed according to the NAVSTA Mayport Light Management Plan to minimize light contribution to urban sky glow which could be visible from the sea turtle nesting beach.

We find this project consistent with our authorities under Florida's Coastal Zone Management Program. As additional project information is developed or becomes available, the FWC may have additional comments regarding appropriate conservation measures. If your staff has any specific questions regarding our comments in this letter, I encourage them to contact Kelly Roberts at 850-922-4330 or Kelly.Roberts@myfwc.com.

Sincerely,

Kipp Frohlich, Section Leader
Imperiled Species Management Section

RKF/kr

http://portal.fwc.state.fl.us/DOI/Divisions/HSC/Imperiled Species Management S/ImperiledSpecies/ISMtracking/17440/FWC Correspondence