Pre-Final

SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT

FOR

ADDITIONAL CONSTRUCTION AT THE

MARINE SPECIAL OPERATIONS COMMAND COMPLEX

May 2012

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Responsible Officer

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May 2012

NAVFAC Naval Facilities Engineering Command
NAVFAC MIDLANT

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EXECUTIVE SUMMARY

The United States Marine Corps (USMC) proposes to construct, operate, and maintain additional facilities and infrastructure at the U.S. Marine Corps Forces, Special Operations Command (MARSOC) complex located in the Stone Bay area of Marine Corps Installations East-Marine Corps Base Camp Lejeune (MCIEAST-MCB CAMLEJ), North Carolina. Associated with the Proposed Action is an influx of approximately 750 additional active duty personnel to MCIEAST-MCB CAMLEJ. The additional facilities at the MARSOC Complex would provide the resources that are needed to meet the operational and training requirements of the MARSOC headquarters and operational units.

ES.1 DESCRIPTION OF THE PROPOSED ACTION

The Proposed Action would include the construction, operation, and maintenance of new facilities and infrastructure at the MARSOC complex at MCIEAST-MCB CAMLEJ. MARSOC has developed a conceptual "2025 MARSOC Facilities Plan" to arrange the proposed buildings on the available landscape at Stone Bay; detailed site designs for individual projects are not yet available. Facilities would be constructed beginning in fiscal year (FY) 2012 and continue through FY 2017. The proposed facilities would include a combination of new buildings and additions to existing buildings, and new roadways. The proposed facilities would include additional space for administration, military classroom-based training, weapons storage, boat storage, tactical vehicle and boat maintenance, and childcare provision. Please refer to Table 2.1-1 in Chapter 2 of this SEA for a listing of the proposed projects.

Site improvements would include grading, pavement, security lighting, utility connections, and stormwater management. A large number of the projects would be constructed on previously cleared areas within the existing boundaries of the MARSOC development; however, a few of the projects would require the MARSOC area to expand into forested areas currently used for ground training. MARSOC has included the cost of fill dirt into the project funding requests; the proposed action does not include any new borrow pits. Total acreage disturbed from the proposed projects would be approximately 162 acre (ac) (66 hectare [ha]) within the 2,017 ac (816 ha) MARSOC complex, plus additional disturbance for stormwater management.

The Proposed Action also includes replacement of a tactical landing zone (TLZ) referred to as TLZ Owl. TLZ Owl is a cleared landing area of approximately 6 to 8 ac (2.4 to 3.2 ha) and supports existing MV-22 (or "Osprey") and other rotary aircraft training, including practice landings and take-offs. TLZ Owl would be replaced with a new larger TLZ in the Stone Bay area or would be functionally replaced by enlarging TLZ Vulture. Traditional levels of operations at TLZ Owl would be shifted to the replacement location; operations are not expected to increase as a result of the proposed action.

ES.2 ALTERNATIVES CONSIDERED

Several alternatives to the Proposed Action were considered. Due to the highly developed, consolidated environment of the existing portions of the MARSOC complex, most of the proposed facilities have only one optimal location because they would either expand existing facilities or need to be located near them. However, several layouts were considered for the

remaining projects. These projects would occur to the south of the existing MARSOC complex along Everett Creek Road.

The alternatives considered were evaluated based on the following factors:

1. Consolidation of facilities to the extent practicable to reduce sprawl.
2. Location that allows for the construction of facilities with respect to topography and soils composition.
3. Location in which RCW habitat impacts are minimized.
4. Location in which water resources/wetlands impacts are minimized.
5. Location in which IR site impacts are minimized.
6. Location in which impacts to operations/training are minimized.

All of the alternatives considered except the Preferred Alternative and the No Action Alternative were dismissed based on the selection criteria listed above as well as several site, environmental, and water resource constraints. Reasons for dismissal included: presence of an aquifer use control area associated with Installation Restoration (IR) site that has a history of chemical weapons munitions disposal; development restrictions associated with an explosive arc surrounding existing ammunition storage facilities; unnecessary sprawl that could potentially impact future habitat of the red-cockaded woodpecker (RCW); and space limitations between existing constraints and previously planned projects. MARSOC planners also consider construction of multi-story buildings to reduce building footprints but the footprint savings that would be realized was not sufficient to justify the extra cost of multi-story construction since many of the planned facility uses were not suitable for multi-story buildings.

The highly developed environment of the existing MARSOC complex limits development patterns and the need for all of the facilities to be constructed. Two alternatives are carried forward for detailed analysis in this Supplemental Environmental Assessment (SEA): Alternative 1 (The Preferred Alternative) and the No Action Alternative.

Alternative 1 (The Preferred Alternative) consists of constructing all of the projects associated with the 2025 MARSOC Facilities Plan, according to the current layout concept. Alternative 1 meets the purpose and need for the Proposed Action and minimizes environmental impacts to the maximum extent practicable. Under Alternative 1, TLZ Owl would need to be relocated from its existing location near Everett Creek Road due to set back requirements and obstruction heights surrounding a TLZ. This alternative proposes to replace TLZ Owl with a new larger TLZ at one of four locations, or by expanding TLZ Vulture. The new location would be up to 23 acres in size, cleared, graded, and regularly maintained. Two of the potential locations are on the east side of the MARSOC complex, one site is located in the southwest corner of the MARSOC complex, near NC 210, and the fourth site is located on the north side of the MARSOC complex, within the boundary of an IR site. TLZ Vulture is in the Stone Bay Area and is currently 8 acres approximately in size.

A **No Action Alternative** was also considered. Under this alternative additional facilities would not be constructed in the Stone Bay area at MCIEAST-MCB CAMLEJ, and TLZ Owl would remain in its current location. MARSOC personnel and facilities would continue to be dispersed throughout the installation. The influx of approximately 750 additional active duty personnel would still occur. The Council on Environmental Quality (CEQ) guidelines require analysis of the No Action Alternative to assess any environmental consequences that may occur if the Proposed Action is not implemented.

ES.3 ENVIRONMENTAL IMPACT OF THE PROPOSED ACTION

Consistent with 40 CFR 1501.7 (a)(3), several resource areas have been eliminated from detailed analysis because the Proposed Action either has no potential to impact them or the potential impacts would be negligible. These resources include: socioeconomics, community facilities and services (with the exception of childcare), and infrastructure and utilities (with the exception of stormwater). The following is a brief summary of the anticipated impacts from the Proposed Action. For a detailed description and analysis, refer to Chapter 3 of this SEA.

Land Use and Coastal Zone Management. The proposed action would result in changes to land use on MCIEAST-MCB CAMLEJ property in the Stone Bay area. Land currently designated Range and Training area would need to be approved for closure and re-designated administrative/cantonment area by Headquarters Marine Corps Installation and Logistics and Training and Engineering Command before the area could be opened for construction. The Proposed Action would have no effect on land use to adjacent properties outside the boundaries of MCIEAST-MCB CAMLEJ. MCIEAST-MCB CAMLEJ has reviewed the enforceable policies of the North Carolina Coastal Area Management Act (CAMA) and determined that the Proposed Action would be fully consistent with these policies. The Proposed Action has been coordinated with the North Carolina Department of Environment and Natural Resources (NCDENR).

Community Facilities and Services (Childcare only). Increased demand for childcare on would be partially met by the construction of a new Child Development Center (CDC) at the MARSOC complex. The new CDC would provide accommodation for an additional 230 children. There would still be a shortfall of childcare for 1,753 children on-base, which would be addressed with future CDCs located elsewhere on-base property (not within the Stone Bay area) as funding becomes available.

Utilities and Infrastructure (Stormwater only). The Proposed Action would result in approximately 5,782,987 square feet (sf) (537,257 square meters [sq m]) of new impervious surfaces. The increased quantity of stormwater run-off would be managed and controlled by implementation of Best Management Practices (BMPs) and erosion and sediment control features, in accordance with MCIEAST-MCB CAMLEJ's Stormwater Pollution Prevention Plan, their National Pollutant Discharge Elimination System (NPDES) stormwater permit, and applicable regulations.

Transportation and Traffic. Construction vehicles would have temporary negative impacts to traffic flow near the entrance to Stone Bay. Once construction is complete, the traffic volume along NC 210 would permanently increase with the increase in personnel driving to the Stone Bay area each day. Other nearby roadways could experience increases in traffic from the

increase in commuters who live in different parts of MCIEAST-MCB CAMLEJ and the surrounding counties; namely US 17, NC 172, and NC 24. The shift in work place for MARSOC personnel to the Stone Bay area could result in potential reductions in traffic during daily commuting near MCIEAST-MCB CAMLEJ's main gate and on the mainside (portion of MCIEAST-MCB CAMLEJ that is east of New River). There would also be additional transportation of goods from the periodic delivery of supplies to the MARSOC complex. A new road into the Stone Bay area is currently under construction 0.4 mi (0.7 km) north of the intersection of Rifle Range Road and NC 210. Once the new entrance into Stone Bay is constructed (anticipated in the fall of 2013), the existing Rifle Range Road entrance would be closed. The relocation of the boat maintenance facility from Courthouse Bay to the MARSOC complex would result in minor adverse effects to traffic flow. There is no launching point along the shoreline near the MARSOC facilities, existing or proposed. Therefore, training with these boats would require that they be hauled over from the maintenance complex to launching points at Courthouse Bay or another designated launch area.

Noise. The proposed action would temporarily generate noise during land clearing and certain components of the construction. Noise generated during construction would be temporary and is not expected to reach off-base. The proposed relocation of TLZ Owl would not be expected to result in a perceptible difference in area noise levels; based on historic usage of TLZ Owl operation levels at the new site would not be great enough in number to cause off-base impacts regardless of location, or even if combined with operations at TLZ Vulture. The potential for noise impacts would be further reduced by planning approach and departure routes to avoid overflights of sensitive noise receptors.

Air Quality. The Proposed Action would result in minor air emissions and would not have an adverse effect on the air quality of the region. Operation of construction vehicles, facility construction, and operation and maintenance of the new facilities would generate negligible adverse air emissions. In addition, the operation of TLZ Owl in an alternate location would not be any different than the existing TLZ operation with regard to air emissions.

Terrestrial Resources. The Proposed Action would cause minor adverse effects to existing topography and soils due to clearing, grading, compaction, and potential erosion of the project area. Preliminary soils studies have shown that under the Proposed Action, sufficient area with suitable soils and topography for the proposed facilities would be provided.

Based on conceptual design layout, implementing the Proposed Action would result in the removal of up to approximately 139 ac (56 ha) of forested habitat within the 162 ac (66 ha) area potentially affected by the proposed action. The forested areas contain merchantable timber and are currently managed by the Base forestry program for natural resource and mission related objectives. After clearing, this acreage would be permanently removed from future timber production and adjacent areas that remain forested would be more difficult to manage due to increased fragmentation and also due to the MARSOC mission, which would restrict access within the forests around the new structures, particularly within the MARSOC fenceline.

The Proposed Action would reduce the acreage of available wildlife habitat and fragment the remaining acres, thereby reducing their attractiveness to some species. There could be minor impacts to movement of wildlife species in the vicinity of the project site as a result of

implementing the Proposed Action. Additional fencing would pose new restrictions to wildlife movement and restrict the use of the remaining habitat. No federally-listed threatened or endangered species occur in the proposed project areas. The Proposed Action would reduce acres available in the future to the federally listed RCW but would not adversely affect any current RCW habitat. Up to 65 ac (26 ha) of future RCW habitat and one future RCW partition (currently unoccupied but expected to be in the future based on MCIEAST-MCB CAMLEJ recovery goals and planning) would be lost. MCIEAST-MCB CAMLEJ currently has sufficient remaining suitable habitat to reach recovery goals for RCW despite the potential loss of this partition.

Water Resources. Impacts to surface waters would be minimized through the use of informed site planning and BMPs during and after construction. The Proposed Action would not disturb the underlying Castle Hayne Aquifer. However, site drainage improvements would affect shallower groundwater within the limits of disturbance for individual projects. Ditching or other drainage measures may be required to alleviate the high water table at the proposed construction area. There are no water supply wells within the vicinity of the project site.

It appears that up to 0.42 ac (0.17 ha) of palustrine wetlands, 0.13 ac (0.05 ha)of which would be spanned by a bridge not filled, and 225 linear ft (69 m) of stream would be impacted by the Proposed Action. Each project within the Proposed Action would undergo full design, and avoidance of wetlands to the maximum extent practicable would be a requirement of the design contract. BMPs would be utilized to avoid siltation of nearby wetland areas and wetland mitigation would occur, as per all applicable permit regulations.

The project location is not within the 100-year floodplain. The Proposed Action involves only minor changes to topography; no changes to current floodplain boundaries are expected to result.

Cultural Resources. No cultural resources impacts are expected from the current proposed action, either to archaeological or historic architectural resources. No construction or demolition is proposed within the Historic District. No construction is proposed in the area of any NRHP eligible archaeological site. Alternative TLZ Owl site #4 is near a multi-component prehistoric camp and an eighteenth century historic home site location. The boundaries of the TLZ would not overlap the site and therefore no direct impacts are expected. Foot traffic in the surrounding woods could potentially increase because of the proximity of the new TLZ if this alternative location were chosen. Base environmental staff reviews all training events that include digging or other ground disturbing activities per established review procedures that apply throughout the Base; avoidance of impacts to the site would be ensured through this process.

Hazardous Materials and Waste. The Proposed Action would introduce no new hazardous materials or waste beyond those that already are handled at MCIEAST-MCB CAMLEJ.

Installation Restoration. Several areas of interest to the Installation Restoration (IR) program exist in proximity to the project area. These include historic ranges that are potentially contaminated with unexploded ordnance (UXO) and sites with other types of soil and groundwater contamination. There are two active Military Munitions Response Program sites: UXO-02 (near IR-69) and UXO-14 (north of IR-68). IR-68 is a former disposal area and any land disturbing activities in this area have the potential of uncovering buried waste. One

alternative site for the TLZ Owl relocation overlaps IR Site 68. While it's been determined through assessment that there is no evidence to suggest that site media pose a potential health risk at IR Site 68, land use and aquifer use controls are in place due to the elevated level of inorganics, presence of buried waste, and potential for previously unidentified contaminants. Notification would be required to the state of North Carolina and the Environmental Protection Agency prior to any land disturbing activities, and construction workers at the site would be required to have 40-hour HAZWOPER training. Also included within the proposed action is a multi-story Bachelor Enlisted Quarters (P1433) that is currently proposed to be placed in a location that is thought to have been previously considered for construction of a rifle range. The site would be assessed for suitability prior to any construction, and would undergo a formal administrative range closure process. The Proposed Action avoids IR Site 69, and UXO-02 and UXO-14. A fence would continue to restrict access to IR Site 69.

ES.4 CUMULATIVE IMPACTS

The potential impacts of the Proposed Action were compared to the potential impacts associated with other recent, ongoing, and future projects at MCIEAST-MCB CAMLEJ. It was determined there would be minor adverse cumulative effects from this action.

Natural Resources: Associated with the original Proposed Action, the initial stand-up of the MARSOC at MCIEAST-MCB CAMLEJ in 2007, was an influx of approximately 875 additional active duty personnel. A considerable change to existing land use patterns occurred around the Stone Bay Area to support the new command, changing from a forested training area to a developed training and operational area. Previous MARSOC related construction in the Stone Bay area required clearing approximately 220 ac (89 ha) of forest. Approximately 544 ac (220 ha) have been converted from training area and RCW habitat to developed cantonment for the MARSOC. Irreversible adverse cumulative effects on RCW population is not anticipated because MCIEAST-MCB CAMLEJ has been able to successfully replace lost clusters in existing suitable habitat, on-base, in a reasonably short time period in the past. However, there is a potential for additional adverse cumulative effects from future range development projects depending on what alternatives are identified and considered. MCIEAST-MCB CAMLEJ is actively investigating opportunities to mitigate future impacts to RCW clusters off of the Base, through partnerships with the NC Wildlife Resources Commission and through land acquisition and conservation easements.

Stormwater: A large increase in impervious surfaces , 1,554,976 sf (144,462 sq m), resulted from the construction associated with the original standup of MARSOC. This would be added to by a number of smaller projects that were recently reviewed and categorically excluded from further documentation, as well as the proposed action considered within this supplemental EA.

Wetlands: Approximately 12.5 ac (5 ha) of wetlands and 12,800 linear feet (ft) (3,901 meters [m]) of streams have been impacted for the construction completed to date on behalf of MARSOC. Projects previously permitted by the Wilmington District, Army Corps of Engineers for construction at MCIEAST-MCB CAMLEJ total approximately 543 ac (220 ha) of impacted wetlands that were mitigated through the Greater Sandy Run Area Wetland Mitigation Bank. As of November 30, 2011, 894.932 mitigation credits have been used out of the 1250.500 credits established in the bank as of June 26, 2007. There are 355.568 remaining mitigation credits

available for use in the bank. MCIEAST-MCB CAMLEJ has also mitigated for wetland impacts through the NC Ecosystem Enhancement Program when suitable credits were not available through the Greater Sandy Run Area Wetland Mitigation Bank.

ES.5 MITIGATION

The following mitigation measures would be implemented as part of the Proposed Action:

1. Site design for two adjacent projects, Special Operations Forces, Marine Special Operations Battalion Company/Team Facilities (P1218) and Special Operation Forces, Survival, Evasion, Resistance, and Escape Training Facility (P1393), would include necessary technical and creative effort to preserve as much as the existing natural environment as possible. The proposed construction site is located within an area that has been set aside for future endangered species habitat; accordingly, the site plan development would give preference to retaining natural forest areas within the proposed project limits to the maximum extent practicable.

2. MARSOC would consider providing funding to MCIEAST-MCB CAMLEJ RCW recovery efforts, including off-base partnerships that are currently in development under coordination with the US Fish and Wildlife Service. Funding would be sufficient to offset current and future predicted impacts to habitat from MARSOC related projects.

3. Air emissions from heating and cooling systems would be minimized by using a non-distributed boiler network that would use liquid petroleum gas. In addition, construction effects would be controlled using standard management practices such as routine sweeping and wetting to reduce air emissions.

4. If during construction and site grading any site of potential historical or archaeological significance is encountered, the installation commander would be notified. The unit commander would order actions in the vicinity halted and the area marked. The unit commander would immediately notify MCIEAST-MCB CAMLEJ's archaeologist at telephone (910) 451-7230.

5. BMPs would be used to avoid and minimize the release of sediments into stormwater, with mitigation plans including both short-term (construction phase) and long-term (project life) features to meet the requirements of MCIEAST-MCB CAMLEJ's Stormwater Pollution Prevention Plan. Other mitigation measures would include planting grass on bare areas and landscaping in select areas. Site design would consider regulatory requirements relating to stormwater and include discussions with North Carolina Department of Environment and Natural Resources (NCDENR) for type and placement of required BMPs and low-impact development features. Mitigation measures for loss of vegetation would include planting grass along roadsides and around buildings, with the addition of shrubs, trees and mulching in select areas.

6. All projects would be designed to avoid and minimize impacts to wetlands and waters of the US. MARSOC would abide by the MCIEAST-MCB CAMLEJ policy that all new construction will maintain a 50 ft setback from wetlands, wherever possible. In addition,

wetland and stream mitigation would be conducted to fulfill all permit condition requirements.

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Acronyms and Abbreviations

2d	Second
3d	Third
ac	acre
ADNL	A-weighted Day-Night Level
AECs	Areas of Environmental Concern
AT/FP	Anti-terrorism/Force protection
BMPs	best management practices
BUA	built-upon area
CAAAC	Combined Arms Amphibious Assault Course
CAIS	Chemical Agent Identification Sets
CAMA	Coastal Area Management Act
CDC	Child Development Center
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Act Information System
CEQ	Council on Environmental Quality
CDNL	C-weighted Day-Night Level
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CWM	Chemical Weapon Munitions
CZMA	Coastal Zone Management Act
dB	decibel
dBA	A-weighted decibel
DoD	Department of Defense
DNL	Day-night Sound Level
DRMO	Defense Reutilization and Marketing Office
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMD	Environmental Management Division
ESA	Endangered Species Act
ESC	Erosion and Sediment Control
EO	Executive Order
FONSI	Finding of No Significant Impact
ft	feet
FY	Fiscal Year
GHGs	Green House Gases
GP	Gun Position
ha	hectare
HAPS	Hazardous Air Pollutants
HQW	High Quality Waters
INRMP	Integrated Natural Resources Management Plan
IR	Installation Restoration
kg	kilogram
km	Kilometer

lbs	pounds
LOS	Level of Service
m	meter
mi	mile
MARSOC	Marine Special Operations Command
MBTA	Migratory Bird Treaty Act
MCAS	Marine Corps Air Station
MCB	Marine Corps Base
MI	Mile
MMRP	Military Munitions Response Program
MSOB	Marine Special Operations Battalion
MSOR	Marine Special Operations Regiment
MSOS	Marine Special Operations School
NAAQS	National Ambient Air Quality Standards
NCAC	North Carolina Administrative Code
NCDENR	North Carolina Department of Environment and Natural Resources
NEPA	National Environmental Policy Act
NFRAP	No Further Response Action Plan
NMFS	National Marine Fisheries Service
NO	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NSW	Nutrient Sensitive Waters
O_3	Ground Level Ozone
Pb	Lead
PM	Particulate Matter
PM_{10}	Particulate Matter 10 microns in diameter or less
$PM_{2.5}$	Particulate Matter 2.5 microns in diameter or less
POW	Prisoners of War
RCW	Red-cockaded Woodpecker
RHIB	Rigid Hulled Inflatable Boat
ROD	Record of Decision
RPW	Relatively Permanent Water
SEA	Supplemental Environmental Assessment
SERE	Survival, Evasion, Resistance, and Escape
sf	square feet
SO_2	Sulfur Dioxide
SO_x	Sulfur Oxides
SOF	Special Operations Forces
sq m	square meter
TLZ	Tactical Landing Zone
TSP	Total Suspended Particulates
USACE	United States Army Corps of Engineers
USACHPPM	US Army Center for Health Promotion and Preventative Medicine
U.S.	United States
U.S.C.	United States Code

USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USMC	United States Marine Corps
USSOCOM	United States Special Operations Command
VOC	Volatile Organic Compound

1 PURPOSE AND NEED

1.1 INTRODUCTION

The United States Marine Corps (USMC) proposes to construct additional facilities and infrastructure at the U.S. Marine Forces, Special Operations Command (MARSOC) complex located in the Stone Bay area of Marine Corps Installations East-Marine Corps Base Camp Lejeune (MCIEAST-MCB CAMLEJ), North Carolina. In August 2007, an Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) were completed for the proposed construction of the original MARSOC complex (Department of the Navy, 2007a). A copy of this EA/FONSI is hereby incorporated by reference and may be obtained by contacting the MCIEAST-MCB CAMLEJ Environmental Management Division (EMD).

Since the original construction, MARSOC has undergone reorganization and anticipates future growth that requires additional facilities and infrastructure to support the MARSOC mission at MCIEAST-MCB CAMLEJ. The intent of this Supplemental Environmental Assessment (SEA) is to assess the potential environmental impacts from construction of these additional facilities and infrastructure. The new facilities would include a combination of administration, operational, and military classroom-based training buildings; support facilities; additional fencing and a connector road. Since the new construction would encroach upon an existing tactical landing zone (TLZ) located within the MARSOC complex, the Proposed Action also includes relocation of the TLZ.

This SEA has been prepared by the USMC in accordance with the National Environmental Policy Act (NEPA) of 1969, 42 United States Code (USC) 4321-4370d, as implemented by the Council on Environmental Quality (CEQ) regulations, 40 Code of Federal Regulations (CFR) Parts 1500-1508 and the NEPA procedures contained in the Marine Corps Order P5090.2A, Change 1, Chapter 12, dated January 22, 2008, *Environmental Compliance and Protection Manual*, which establishes USMC procedures for implementing NEPA.

1.2 BACKGROUND AND PROJECT HISTORY

MCIEAST-MCB CAMLEJ is located in Onslow County in southeastern North Carolina, approximately halfway between Wilmington and New Bern (see Figure 1-1). The existing MARSOC complex is located in the Stone Bay area of MCIEAST-MCB CAMLEJ, on the west side of the New River. The complex encompasses approximately 2,017 acres (ac) (816 hectares [ha]) (see Figure 1-2).

Special operations have long been part of the Marine Corps' mission. Marine units such as Force Reconnaissance routinely conduct special operations, including reconnaissance and surveillance to observe, identify, and report enemy activity. In 2005, the Secretary of Defense approved a joint recommendation by the Marine Corps and the United States Special Operations Command (USSOCOM) to create a Marine Special Operations Command as a component of USSOCOM. On February 24, 2006, the Marine Corps officially joined USSOCOM, standing up the new special operations command at MCIEAST-MCB CAMLEJ. The activation of

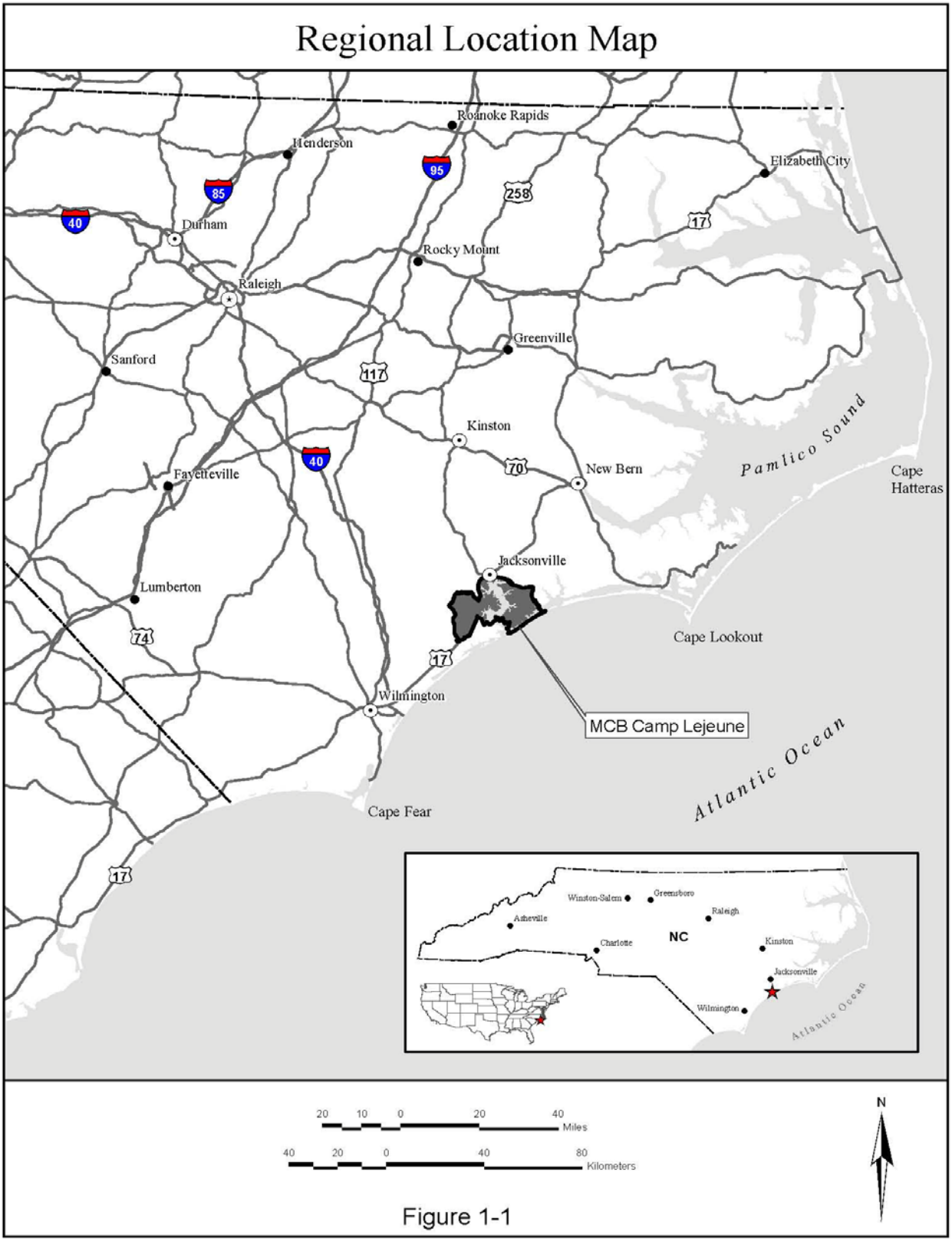

Figure 1-1 Regional Location Map

Figure 1-2 MARSOC Complex Location Map

MARSOC assembled a headquarters command that is responsible for five subordinate commands: 1) Marine Special Operations Advisor Group; 2) Marine Special Operations Support Group; 3) Marine Special Operations School; 4) Marine Special Operations Battalion East; and 5) Marine Special Operations Battalion West. The headquarters command and the first four subordinate commands from the list were established at MCIEAST-MCB CAMLEJ, while the Marine Special Operations Battalion West was based at Camp Pendleton, California.

The overall mission of MARSOC is to train, organize, equip, and when directed by the Commander of USSOCOM, deploy task oriented, scaleable and responsive USMC Special Operations Forces (SOF) worldwide in support of combatant commanders and other agencies. In order to execute this mission, MARSOC concentrates on several core activities: 1) Foreign International Defense; 2) Unconventional Warfare; 3) Special Reconnaissance; 4) Direct Action; 5) Counterterrorism; and 6) Information Operations.

Currently, there are approximately 2,355 personnel associated with MARSOC at MCIEAST-MCB CAMLEJ. After signing the original FONSI in August 2007 that stood up the MARSOC complex, USSOCOM developed a Manpower Study that recommended an increase in Marine Corps staff at MARSOC nationwide by approximately 1,001 personnel by Fiscal Year (FY) 2016. Of the 1,001 personnel, approximately 750 would be located at MCIEAST-MCB CAMLEJ. The 750 new personnel would be sourced from world-wide USMC locations and/or recruited from within the USMC and trained. These new personnel would be phased in yearly from FY 2013 to FY 2015. In support of this planned future growth, and to maximize consolidation of MARSOC personnel; additional facilities and infrastructure are required at the existing MARSOC complex at MCIEAST-MCB CAMLEJ (see Chapter 2 of this SEA for a more detailed description of the facilities).

Although the existing MARSOC complex at MCIEAST-MCB CAMLEJ supports the majority of the MARSOC personnel, not all of the personnel are located at the existing MARSOC complex. Two Battalions, the 2d Marine Special Operations Battalion (MSOB) and the 3d MSOB are located at other areas of MCIEAST-MCB CAMLEJ and would move to the facilities to be constructed under the Proposed Action. In order to enhance mission preparation, all MARSOC facilities need to be consolidated to a single area. As a special operations command, the facility and infrastructure requirements of MARSOC are unique. In particular, MARSOC needs a consolidated compound with a high-level of security and isolation from outside traffic for SOF training and mission preparation. Therefore, it is not ideal to have facilities located outside of the core complex. Additionally, the facilities that these Battalions currently occupy are primarily temporary and outdated structures that are not sufficient to support future planned growth. These Battalions have been recently reorganized, with a plan to fully staff them at four Companies. Their existing facilities do not have sufficient capacity to support this projected increase in personnel. Once these Battalions are relocated, the currently occupied facilities would be utilized by other MCIEAST-MCB CAMLEJ personnel.

The proposed increase in personnel associated with MARSOC on MCIEAST-MCB CAMLEJ represents a relatively minor population increase especially given that other predicted increases are no longer projected to occur. Overall population levels at MCIEAST-MCB CAMLEJ are expected to remain below the increases that were projected under the Grow the Force initiative, which was a Presidential mandate to grow the USMC from approximately 180,000 to

approximately 202,000 by FY 2011. Under Grow the Force, MCIEAST-MCB CAMLEJ was expected to grow by approximately 7,706 personnel plus dependents, which represents an approximate increase of 19 percent from the FY 2006 population baseline (Department of the Navy, 2009b). While the Department of Defense (DoD) has met its goals of increasing USMC personnel, due to changing mission requirements, the Department of Defense has plans to begin scaling back the total number of USMC personnel from the Grow the Force increases beginning in FY 2012. According to the Department of Defense, USMC 2010 Force Structure Review, the USMC would reduce its end strength from 202,000 to approximately 186,800 following the completion of Marine Corps operations in Afghanistan (USMC, 2011). The personnel reductions would occur in phases between FY 2012 and FY 2016 in order to maintain USMC strength. Personnel reductions would occur throughout the USMC force including a substantial reduction at MCIEAST-MCB CAMLEJ. However, notably exempt from any downsizing is MARSOC. Because of the projected scaling back of overall USMC forces, the proposed increases in MARSOC personnel would not change population levels overall at MCIEAST-MCB CAMLEJ.

1.3 PURPOSE AND NEED FOR THE PROPOSED ACTION

At MCIEAST-MCB CAMLEJ, MARSOC is expected to be a fully integrated component of USSOCOM with the aim of enhancing and expanding SOF capabilities. In order to meet and support the extremely complex and demanding SOF capabilities requirements, MARSOC must have adequate facilities. The proposed additions to the existing MARSOC complex would fully support the operational and training mission of MARSOC at MCIEAST-MCB CAMLEJ by providing the necessary buildings, training facilities, infrastructure, and utilities to support the reorganization and future growth of MARSOC by approximately 750 personnel.

Several community support facilities are needed at the complex to support personnel, including a 230 seat Child Development Center (CDC) and SOF Performance Resiliency Center. MCIEAST-MCB CAMLEJ operates nine CDCs. In 2009, Marine Corps Community Services completed a CDC requirement study to determine the current need for child care on-base and to provide recommendations for CDC siting and capacities at MCIEAST-MCB CAMLEJ. The CDC requirement study recommended that a total of 12 CDCs should be in operation at MCIEAST-MCB CAMLEJ in order to meet the estimated demand for on-base child care (Department of the Navy, 2010). The new CDC would support the proposed increase in MARSOC personnel as well as other personnel within the Rifle Range area. The SOF Performance Resiliency Center would also support the new MARSOC personnel by providing physical therapy and other physical performance training and rehabilitation.

Training and operational support facilities are also needed to meet the demanding SOF training requirements. These facilities include Survival, Evasion, Resistance, and Escape (SERE) training facilities; a range sustainment training complex; training tank expansion; an expanded paraloft facility and a 20 kennel military working dog facility.

Several mixed-use facilities are needed to support administrative, classroom, and operational planning functions. These facilities also include headquarters buildings for 2d MSOB, 3d MSOB, and SOF Combat Service Support organizations. Additionally, a SOF Motor Transport

Maintenance Facility is needed to provide storage and service and repair functions for vehicles and small boats.

Supporting facilities and infrastructure, such as connections to existing utilities, a connector roadway/bridge, paved parking, security lighting, additional area fencing and stormwater management would be needed in order to ensure the new facilities are operable.

Finally, TLZ Owl needs to be replaced because the proposed new construction would encroach upon the current location. The proposed action would place buildings on and around the current site of TLZ Owl.

1.4 THE ENVIRONMENTAL REVIEW PROCESS

1.4.1 The National Environmental Policy Act

NEPA of 1969 requires consideration of environmental issues in federal agency planning and decision making. Under NEPA, federal agencies must prepare an EA or an EIS for any federal action, except those actions that are determined to be "categorically excluded" from further analysis.

An EIS is prepared for those federal actions that may significantly affect the quality of the natural or human environment. An EA is a concise public document that provides sufficient analysis for determining whether the potential environmental impacts of a proposed action are significant, resulting in the preparation of an EIS, or not significant, resulting in the preparation of a FONSI.

The intent of this SEA is to assess the potential environmental effects of constructing additional facilities and infrastructure for the existing MARSOC complex. An SEA is being prepared because an EA/FONSI was previously completed in August 2007 for construction of the MARSOC complex; however, this additional construction would incur additional impacts that were not analyzed in the original EA. The Commanding General of MCIEAST-MCB CAMLEJ is the decision maker with regard to the Proposed Action and will use the information from this SEA to make one of three decisions: 1) a FONSI is appropriate and the action may proceed as planned; 2) a FONSI is appropriate only if prescribed mitigation measures are accomplished and incorporated into the FONSI and project design or 3) a FONSI is not appropriate and proceeding with the action as described would first require the preparation of an EIS.

This SEA has been prepared pursuant to NEPA and the following NEPA implementation regulations and guidelines:

- The CEQ regulations, as contained in 40 CFR Parts 1500 to 1508, which direct federal agencies on how to implement the provisions of NEPA; and
- Marine Corps Order P5090.2A, Change 1, Chapter 12, which documents the USMC's internal operating instructions on how it implements the provisions of NEPA.

This SEA will be reviewed by the decision maker, who will make a determination as to whether a FONSI or EIS is appropriate. Should the decision maker conclude that a FONSI is appropriate,

one would be prepared that summarizes the issues presented, it would be signed by the decision maker, and a notice to that effect would be published in the local newspaper.

1.4.2 Scoping and Identification of Environmental Issues

A project kickoff meeting was held on July 25, 2011 to discuss potential alternatives to be considered in the SEA. Representatives included personnel from MCIEAST-MCB CAMLEJ's Installations and Environment/Installations Development Division; Environmental Management Division, Environmental Conservation Branch; Marine Corps Installations East, Range Development and Management; and Naval Facilities Engineering Command. A follow-on meeting/conference call was held on August 15, 2011 to further refine the alternatives. Additional meetings were held in the Fall/Winter of 2011 with MCIEAST-MCB CAMLEJ, MARSOC, and Naval Facilities Engineering Command staff to refine the alternatives and make final determinations on which projects should be included in the SEA. A scoping meeting was held with regulatory agencies in North Carolina in January 2012 to discuss potential impacts from construction of the proposed facilities.

The focus of this SEA is to assess the potential environmental impacts of the proposed construction of additional facilities and infrastructure at the existing MARSOC complex at MCIEAST-MCB CAMLEJ. Since this document supplements the EA that was completed in 2007, only those resources potentially affected by the new construction are discussed. The intent of this document is to provide a streamlined review of the potential direct and indirect impacts of the Proposed Action. Relevant issues include potential impacts to land use and the coastal zone, community facilities and services (childcare only), utilities and infrastructure (stormwater only), transportation and traffic, noise, air quality, terrestrial resources, water resources, hazardous materials and waste, and installation restoration. These resources will be addressed in this SEA, along with an analysis of Cumulative Impacts.

Resources that will not be discussed in detail in the SEA include: socioeconomics, community facilities and services (with the exception of childcare), infrastructure and utilities (with the exception of stormwater). A brief discussion of why these resources have been eliminated is presented below.

> **Socioeconomics.** The proposed construction activities and increase in personnel would have negligible impacts on socioeconomic resources. As discussed earlier in this chapter, although there would be an increase of approximately 750 personnel to MCIEAST-MCB CAMLEJ, this represents a minor increase relative to the population of the area as a whole and the personnel would be phased in over several years. Additionally, MCIEAST-MCB CAMLEJ and surrounding areas prepared for the Grow the Force initiative personnel increases, which are now projected to be scaled back. The projected increase of 750 personnel at MARSOC would not change the demographics at MCIEAST-MCB CAMLEJ or in the community. There would only be a very minor, short-term increase to the economy from construction activities. There would be no environmental justice concerns associated with the Proposed Action, since the construction would occur on-base and there are no identified minority, low-income, or juvenile populations living in the immediate vicinity.

Community Facilities and Services. The proposed construction activities and increase in personnel would not impact community facilities and services on MCIEAST-MCB CAMLEJ or in the community. Sufficient community facilities and services are already in place to support the minor increase in MARSOC personnel. Since the proposed construction includes a new childcare facility at the MARSOC complex because of existing shortfalls, childcare is the only service that will be discussed in the SEA in detail.

Infrastructure and Utilities. The proposed construction activities would require connections to and support from the existing on-base infrastructure and utility system including electricity, telecommunications, potable water, wastewater, and solid waste disposal. Sufficient infrastructure and utilities are already in place to support the minor increase in MARSOC personnel. Stormwater infrastructure is discussed in detail in the SEA.

Airspace/Public Safety. Operations that would've occurred at TLZ Owl would shift to the new location but would not increase or bring new air traffic over populated areas. The proposed action would require no change to currently airspace characteristics or airspace control, and would introduce no new public safety concerns. .

1.4.3 Agency Coordination and Permit Requirements

In addition to NEPA, other laws, regulations, permits, and licenses may be applicable to the Proposed Action. Specifically, the Proposed Action may require coordination with the following agencies and may require obtaining the following permits:

- Federal Coastal Consistency Determination concurrence by the North Carolina Department of Environment and Natural Resources (NCDENR), Division of Coastal Management;
- Clean Water Act, Section 404 (Discharges of Dredge or Fill Material) approval from the United States Army Corps of Engineers (USACE);
- Clean Water Act, Section 401 Water Quality Certification, NCDENR, Division of Water Quality;
- Concurrence from the United States Fish and Wildlife Service (USFWS) on informal consultation under the Endangered Species Act (ESA) regarding red-cockaded woodpecker (including compliance with the 2006 revision of *MCIEAST-MCB CAMLEJ's Recovery Plan for the Red-Cockaded Woodpecker)*;
- Erosion and Sediment Control Plan approval by the NCDENR, Division of Land Resources, Land Quality Section;
- Water Connection Permit from NCDENR, Public Water Supply Section;
- Stormwater Management Permit from the NCDENR, Division of Water Quality;

- Compliance with the Clean Air Act;

- Non-Discharge Sewer Extension Permit from NCDENR, Division of Water Quality, Non-Discharge Branch; and

- Anti-terrorism/Force Protection (AT/FP) security requirements in accordance with Marine Corps Order P5530.14 dated 21 December 2000.

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2 PROPOSED ACTION AND ALTERNATIVES

The Council on Environmental Quality's *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* establish a number of policies for federal agencies, including "using the NEPA process to identify and assess reasonable alternatives to the Proposed Action that would avoid or minimize adverse effects of these actions on the quality of the human environment" (40 CFR 1500.2 (e)). This chapter provides a detailed description of the Proposed Action and a description of project alternatives, including alternatives eliminated from detailed analysis.

2.1 DESCRIPTION OF THE PROPOSED ACTION

Under the Proposed Action, new facilities and infrastructure would be constructed in the Stone Bay area at MCIEAST-MCB CAMLEJ, as shown in Figure 2-1 and Table 2.1-1. While the proposed facilities are included in the 2025 MARSOC Facilities Plan, final designs have not yet been completed and are currently in the conceptual stage. Facilities would be constructed beginning in FY 2012 and continue through FY 2017. The proposed facilities would include a combination of new buildings and additions to existing buildings, along with new interior roads (associated with P1391) (see P1391 in Table 2.1-1). Facilities would include additional space for administration, military classroom-based training, weapons storage, boat storage, maintenance, and childcare provision.

Site improvements would include grading, pavements, security lighting, utility connections, and stormwater management. New fencing would be installed to encompass a larger area into the MARSOC Complex, essentially up to the installation property line. Total acreage disturbed from the proposed projects would be approximately 162 ac (66 ha), plus additional disturbance for stormwater management.

In addition to the construction projects identified in Figure 2-1 and Table 2.1-1, the Proposed Action also includes relocation of an existing TLZ within the current MARSOC fenceline, referred to as TLZ Owl. TLZ Owl is a cleared landing area of approximately 6 to 8 ac (2.4 to 3.2 ha) and supports existing MV-22 (or "Osprey") and other rotary aircraft training, including practice landings and take-offs. TLZ Owl would be replaced with a new larger TLZ in the Stone Bay area or would be functionally replaced by enlarging TLZ Vulture. Traditional levels of operations at TLZ Owl would be shifted to the replacement location; operations are not expected to increase as a result of the proposed action.

MARSOC currently utilizes an existing boat maintenance facility that is located at Courthouse Bay and is also co-located with the boat launch and pier on the Courthouse Bay shoreline. Under the Proposed Action, as part of the new construction associated with the 2025 MARSOC Facilities Plan, the boat maintenance facility would be relocated to the MARSOC complex (see P1394 in Table 2.1-1) on the western side, close to Highway 210. The boat maintenance facility is also used for classroom style briefings and instructional training. Zodiac boats (inflatable boats without a hull) and other small boats would be stored at this facility. Under the Proposed Action, the small boats would need to be hauled over to Courthouse Bay or other designated launch area, as there is not an existing launch point at the MARSOC complex.

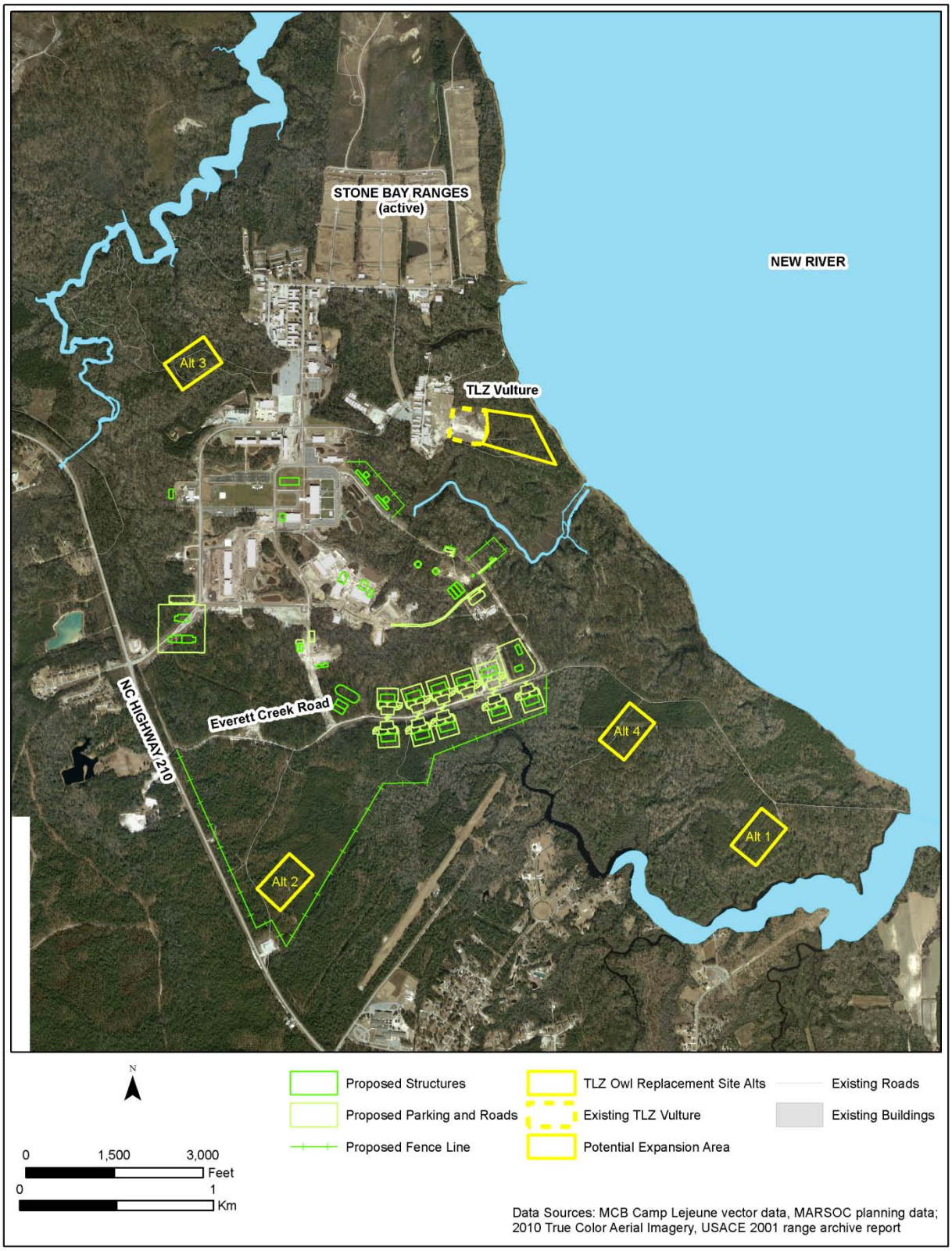

Figure 2-1 Proposed Construction at MARSOC Complex

Table 2.1-1 Proposed Construction Projects for MARSOC

Project Number/FY	**Facility Type**	**Description**	**Size**	**Additional Paved Parking Area or Paved Area**
	TLZ Owl	Relocation of the existing TLZ Owl to one of four alternative sites within the MARSOC complex, or expansion of TLZ Vulture.	23 acres	0
P1440 FY 2012	Survival, Evasions, Resistance, and Escape (SERE) Pre-engineered buildings	This project would install three pre-engineered buildings for use as training labs, instructor and administrative space. The buildings are referred to as the "Advanced Activities Building, Full-Mission Profile Building, and the Special Projects Building."	12,000 SF	0
P1218 FY 2013	SOF MSOB Company/Team Facilities	A team operations facility and Battalion Headquarters for 3d MSOB	236,795 SF plus paving of 800,000 SF of existing gravel roadway	600,000 SF
P1393 FY 2013	SOF SERE Training Facility	Instructional training and practical application facility to conduct SERE courses of instruction	11,205 SF	230,000 SF
P1395 FY 2014	SOF Marine Special Operations Regiment (MSOR) Headquarters	A separate regimental Headquarters facility to support administration, operational planning and mission preparation	30,000 SF	43,600 SF
FY 2014	CDC	Construct a 230 seat CDC to support the entire population at Stone Bay	22,370 SF	21,000 SF
P1391 FY 2014	SOF Sustainment Training Complex	Various training/range facilities to support MARSOC sustainment and mission training requirements	89,976 SF plus 230,000 SF of paved roadway and bridge area	50,000 SF
P1362 FY 2014	SOF Performance Resiliency Center	Provides space for administrative, physical therapy, physical performance education and training, nutrition education and adjacent field house to	39, 288 SF	84,000 SF

Project Number/FY	Facility Type	Description	Size	Additional Paved Parking Area or Paved Area
		support Warfighter Rehabilitation Performance/Human Performance Initiative activities for East Coast based MARSOC units		
P1433 FY 2014	Initial Training Course Bachelor Enlisted Quarters	Multi-story Bachelor Enlisted Quarters with capacity for 240 individuals	61,871 SF	10,000 SF
P1396 FY 2015	SOF Intelligence/Operations Expansion	An expansion of existing facility RR405 to support the operations of an Intelligence Battalion (vice Company)	39,568 SF	0 SF
P1219 FY 2016	SOF MSOB Company/Team Facilities	A team operations facility and Battalion Headquarters for 2d MSOB	236,795 SF plus 800,000 SF of paved road and bridge area	600,000 SF
P1392 FY 2016	SOF Military Working Dog Facility	SOF military working dog facility to include administrative space, 20 kennels	7,201 SF	13,500 SF
P1394 FY 2016	SOF Motor Transport Maintenance Expansion	Provides additional and consolidated maintenance/operations facilities to support reorganization of MARSOC (Regimental Headquarters and two MSOBs at MCIEAST-MCB CAMLEJ) and addition of an Intelligence Battalion (vice Company)	63,000 SF	714,000 SF
P1410 FY 2017	SOF EOD Expansion	Facility to support operational planning, administrative, training, and storage for EOD operations	5,920 SF	18,000 SF
P1284 FY 2017	SOF Training Tank Expansion	Expand existing building RR460 to increase the size of the training tank to accommodate mission training requirements.	34,122 SF	5,000 SF
P1411	SOF Paraloft Expansion	Expand existing building RR460 to increase the size of	25,004 SF	22,000 SF

Project Number/FY	Facility Type	Description	Size	Additional Paved Parking Area or Paved Area
FY 2017		the Paraloft to support MARSOC sustainment and mission training requirements.		
P1288 FY 2017	SOF Combat Service Support Facility	Headquarters, operations and maintenance support facility to provide administrative, operational, and maintenance support services for Combat Service Support organizations	32,292 SF	246,000 SF
Total Acreage of Construction: 162 ac (66 ha) (to account for approximately 10 percent buffer). **Of the 162 ac (66 ha), approximately 67 ac (27 ha) for parking/paved lots; 24 ac (10 ha) for buildings; 46 ac (19 ha) for paved roadways; and 25 ac (10 ha) for the TLZ Owl. These estimates do not include additional space for stormwater management.**				

2.2 ALTERNATIVES ANALYSIS

The following is a discussion of the alternatives that are analyzed in this SEA, along with the alternatives that were considered but dismissed. Factors that must be met for an alternative to be a reasonable option for fulfilling the purpose and need for the Proposed Action are shown below.

Evaluation Factors

1. Consolidation of facilities to the extent practicable to reduce encroachment on adjacent training areas
2. Construction on suitable soils and topography
3. Minimization of impacts to future red-cockaded (RCW) habitat
4. Avoidance and minimization of wetland and surface water impacts
5. Avoidance of Installation Restoration (IR) site impacts
6. Location in which impacts to operations/training are minimized

These factors were used to screen the potential alternatives, which are discussed in further detail in the following sections. Alternatives were screened to minimize potential environmental impacts to the extent practicable while still meeting mission requirements. The alternatives

considered and dismissed are first discussed, followed by a discussion of alternatives carried forward for analysis.

2.2.1 Alternatives Considered but Dismissed

The following is a description of the alternatives that were considered but ultimately dismissed from detailed analysis in the SEA, based on the selection criteria identified above.

MARSOC Construction

Several alternatives to the Proposed Action were considered and dismissed. Most of the proposed facilities have only one optimal location because they need to be collocated with similar facilities or are expansions of existing facilities. For those facilities, alternative locations were not developed. However, several layouts for P1218, P1219, P1393, and P1362 were considered. These projects would be placed along the southern edge of the existing MARSOC complex near Everett Creek Road.

One alternative considered but dismissed was to utilize a portion of the area contained within the Aquifer Use Control Boundary surrounding Installation Restoration (IR) Site 69 for uninhabitated construction such as parking lots, or for the new TLZ Owl site. IR Site 69 has a reported history of chemical weapon munitions (CWM) disposal, and avoidance of this site was recommended by the MCIEAST-MCB CAMLEJ IR Program Manager. Therefore, this alternative was dismissed from consideration.

Safety arcs associated with existing ammunitions storage facilities along Everett Creek Road further limit possible alternative locations for future facilities. These safety arcs preclude development of inhabited buildings and public transportation routes. Project planners considered relocating these ammunition storage buildings to a new location where the safety arcs would overlap areas constrained by IR Site 69. This alternative was dismissed because extensive wetlands exist within the area covered by the existing safety arcs, thus insufficient buildable area would be recovered by the considered relocation.

Other alternative configurations of facilities were considered for the areas south of Everett Creek Road and south of the existing ammunition storage facilities. These alternatives were dismissed because they would result in greater loss of training area and future RCW habitat, and would greatly complicate prescribed burning of the habitat that would remain.

A fourth alternative that was considered and dismissed was the realignment of Everett Creek Road to the north to maximize the buildable area between IR Site 69 and the explosive arc. This alternative was dismissed because insufficient buildable area would be recouped in comparison to the cost of the roadway relocation.

A fifth alternative considered and dismissed was to construct multi-story buildings for certain projects rather than single story, and to consolidate parking areas through the construction of parking garages rather than parking lots. Facility planners at MCIEAST-MCB CAMLEJ determined that while multi-story facilities would help minimize building footprints, the entirety of these structures could not be multi-story due to their intended use. Single story construction would be required to support floor strength requirements associated with the intended use of

substantial portions of the buildings. Sufficient funding was not programmed to allow for the construction of parking garages, and a substantial portion of the parking is for tactical vehicles rather than privately owned cars. Therefore, conceptual layouts involving parking garages and multi-story buildings were not considered further.

2.2.2 Alternatives Considered and Carried Forward

The following sections describe the alternatives that are carried forward for analysis in this SEA. Because of the highly developed environment of the existing MARSOC complex which limits development patterns and the need for all of the facilities to be constructed, only two alternatives are carried forward for analysis: Alternative 1 (Preferred Alternative) and the No Action Alternative. However, Alternative 1 includes several alternatives for the replacement of TLZ Owl as described more fully in the following sections.

2.2.2.1 Alternative 1 (Preferred Alternative)

Under Alternative 1, all of the projects associated with the 2025 MARSOC Facilities Plan (described in Table 2.1-1) would be laid out approximately as depicted in Figure 2-1.

Under Alternative 1, TLZ Owl would be relocated from its existing location near Everett Creek Road to allow for construction of facilities on or directly adjacent to the current TLZ. The replacement TLZ would be achieved by expanding TLZ Vulture or with a new TLZ location larger than the existing TLZ. New TLZs are typically 23 acres in size to allow for simultaneous multiple V-22 operations. As with all TLZs the new location would be cleared, graded, and regularly maintained to control erosion.

As shown in Figure 2-1, four potential sites are considered as possible locations for the relocated TLZ. Sites 1 and 4 are located on the east side of the MARSOC complex, south of IR Site 69. Site 2 is located in the southwest corner of the MARSOC complex, near Highway 210. Site 3 is located on the north side of the MARSOC complex, within the boundary of IR Site 68. All four sites are evaluated under Alternative 1 in this SEA. TLZ Vulture is also being considered for expansion as an alternative to a new TLZ location. TLZ Vulture is currently approximately 8 acres in size.

Alternative 1 satisfactorily meets all evaluation factors.

2.2.2.2 No Action Alternative

Under the No Action Alternative, the proposed new MARSOC complex facilities and infrastructure would not be constructed. The proposed increase in MARSOC personnel would still occur, but would be accommodated in existing facilities dispersed on MCIEAST-MCB CAMLEJ and in those facilities constructed or already previously planned for construction in the MARSOC area (see the August 2007, an Environmental Assessment (EA) and Finding of No Significant Impact (FONSI).

This approach would not meet the purpose and need as described in Section 1.3 and in the evaluation factors and, therefore, is not considered a reasonable alternative. However, CEQ guidelines stipulate that the No Action Alternative be analyzed to assess any environmental

consequences that may occur if the Proposed Action is not implemented. Therefore, this alternative is carried forward for analysis in this SEA.

2.3 ENVIRONMENTAL PROTECTION

The design and construction of current and future MARSOC construction must integrate specific environmental sustainability principles, including the following:

- Preserve and restore site ecosystem and biodiversity;
- Avoid site degradation and erosion;
- Minimize offsite environmental impact;
- Use minimum amounts of energy, water, and materials feasible to meet design intent;
- Select energy and water efficient equipment and strategies;
- Use environmentally preferable products and decrease toxicity level of materials used;
- Use renewable energy and material resources;
- Optimize operational performance in order to ensure energy efficient equipment operates as intended;
- Manage construction site and storage of materials to ensure no negative impact on indoor environmental quality of facilities;
- Reduce construction waste through reuse, recycling, and supplier take-back.

During design and contract requirements, development for later construction environmentally preferable products would be considered for: raw materials acquisition, production, manufacturing, packaging, distribution, reuse, operation, maintenance, and disposal of products. Several materials would be prohibited, such as products containing: asbestos, urea formaldehyde, polychlorinated biphenyls, chlorinated fluorocarbons, and lead (above certain levels).

Each construction contract would require a designated Environmental Manager to oversee the project and to implement procedures for environmental protection. Prior to the start of construction, a preconstruction meeting would be held to discuss the Environmental Protection Plan. This plan would include a description of the environmental training program for workers performing work on the complex, and procedures to protect water, land, air, fish, and wildlife resources. The Environmental Protection Plan would also address monitoring and quality control procedures.

Building designs would incorporate proper fuel handling, dispensing, and storage systems to minimize the risk or impact of fuel spills. All hazardous materials storage areas would be designed to provide appropriate ventilation and spill protection. Consideration would also be given to air quality to minimize the impact of volatile organic compounds, emissions from fossil

fuel burning equipment, dust control during construction, and other airborne pollutants or irritants.

Furthermore, numerous measures would be taken during construction to protect natural resources:

- Confining construction activities to work area limits;
- Removing debris, rubbish, and other waste resulting from construction operations;
- Preventing oily or hazardous substances from entering the ground, drainage area, or surface water features;
- Preventing equipment from fording live streams;
- Identifying land resources to be preserved within work area;
- Conducting earthwork to minimize the duration of exposure of unprotected soils;
- Constructing/installing temporary and permanent erosion and sediment control features as required;
- Tagging each tree and plant that are scheduled to remain;
- Limiting dust and dirt rising and scattering in the air by use of mulch, water sprinkling, temporary enclosures, and other methods;
- Storing volatile liquids in closed containers;
- Maintaining equipment to reduce gaseous pollutant emissions;
- Limiting contractor lay-down areas to those already cleared and/or disturbed for construction.

2.4 EVALUATION OF ALTERNATIVES

Table 2.4-1 summarizes the beneficial and adverse impacts of the two alternatives considered, the Proposed Action (Alternative 1) and the No Action Alternative. The Proposed Action would construct a series of new projects within the existing MARSOC complex to accommodate an increase in personnel and support the MARSOC mission.

Under the No Action Alternative, the proposed increase in personnel would still occur, but no construction activities would occur. The new personnel would be accommodated in existing structures.

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Table 2.4-1 Evaluation of Alternatives

Resource	No Action Alternative	Proposed Action
Land Use and Coastal Zone Management	No changes.	Land cover would change from forested to non-forested and land use would change from military training to a mix of administration, maintenance, supply/storage, community, troop housing, and operations facilities. Historic ranges in the project area would be administratively closed prior to construction. Consistent with enforceable coastal zone policies.
Community Facilities and Services (Childcare)	Without a new CDC, childcare demands on existing CDCs would increase due to an increase in personnel.	Construction of a new CDC would alleviate some of the existing shortfall for childcare on MCIEAST-MCB CAMLEJ and in nearby communities.
Utilities and Infrastructure (Stormwater Management)	No changes.	Stormwater runoff would increase from the new impervious surfaces. Utilization of best management practices would reduce resulting impacts to adjacent areas and surface waters.
Transportation and Traffic	No changes.	During construction there would be temporary traffic increases. Once construction is complete, traffic volume would permanently increase to the Stone Bay area due to the addition of approximately 750 personnel commuting to MARSOC. Personnel relocation from mainside MCIEAST-MCB CAMLEJ to MARSOC may alleviate main gate traffic slightly.
Noise	Noise from TLZ Owl would continue at the current location.	Construction activities would temporarily increase noise levels. Relocation of TLZ Owl would not make a noticeable difference in noise levels compared to its current location. Noise from the proposed breacher facility was modeled at a different location in the original MARSOC EA (USMC, 2007). These modeling results are still valid for the newly proposed location. Noise would be heard from this facility but not to the extent that any land use restrictions or environmental impacts are expected.
Air Quality	No changes.	Construction would temporarily increase air emissions from construction equipment and fugitive dust. No permanent new air emissions sources are proposed.

Table 2.4-1 Evaluation of Alternatives

Resource	No Action Alternative	Proposed Action
Terrestrial Resources	No changes.	Construction activities would cause minor impacts on geology, topography, soils, and forested areas due to clearing, filling, and grading activities. Approximately 65 ac (26 ha) of RCW habitat would be lost resulting in the loss of one future RCW partition out of 173 planned. This loss would not be expected to interfere with MCIEAST-MCB CAMLEJ recovery goals for RCW. Other wildlife species, including migratory birds, would experience loss of habitat and potentially direct disturbance impacts during construction. These impacts are not expected to cause population level impacts to any species, including migratory birds. There are no North Carolina Natural Heritage program recognized natural areas or communities in the vicinity of the proposed project areas.
Water Resources	No changes.	Surface waters would be spanned and not filled. Therefore only minor impacts to aquatic species or aquatic habitats would occur and only as a result of shading from structures spanning surface water. Suitable upland sites have been identified and extensive ditching is not expected. Therefore, adverse impacts to groundwater are expected to be minimal. No construction would occur within the 100-year floodplain. Approximately 0.42 ac (0.17 ha) of palustrine wetlands, 0.13 ac (0.05 ha) of which would be spanned not filled, and 225 linear ft (69 m) of stream would be impacted by the construction footprint. All project designs would strive to avoid and minimize impacts to wetlands and waters of the U.S. to the maximum extent practicable. Best management practices (BMPs) would be utilized to avoid siltation of nearby wetland areas and wetland mitigation would occur, as per all applicable permit regulations.

Table 2.4-1 Evaluation of Alternatives

Resource	No Action Alternative	Proposed Action
Hazardous Materials and Waste/Installation Restoration	No changes.	IR Site 68 is a potential site location for TLZ Owl. Ground disturbance due to construction, operation and maintenance of the TLZ would disturb only the surface horizons of the soil; thus preventing impacts to the IR Site. Proper management of hazardous materials and waste would be ensured through existing standard operating procedures written in compliance with federal and state law. Therefore no adverse impacts from these items are expected.

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3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter provides a description of the existing environmental conditions that have the potential to be affected with implementation of the Proposed Action, along with a discussion of the anticipated impacts. The existing environment serves as the baseline against which impacts of the Proposed Action are measured. Resource areas potentially impacted by the Proposed Action and covered in this SEA include (see Section 1.4.2 for a discussion of resources eliminated from analysis in this SEA):

- Land Use and Coastal Zone Management
- Community Facilities and Services (Childcare only)
- Utilities and Infrastructure (Stormwater management only)
- Transportation and Traffic
- Noise
- Air Quality
- Terrestrial Resources
- Water Resources
- Hazardous Materials and Waste/Installation Restoration

3.1 LAND USE AND COASTAL ZONE MANAGEMENT

3.1.1 Affected Environment

3.1.1.1 Land Use

Land use at MCIEAST-MCB CAMLEJ is predominantly used for operational and training purposes. Most of MCIEAST-MCB CAMLEJ is devoted to land and water training ranges, impact areas, and maneuver and training areas. This reflects MCIEAST-MCB CAMLEJ's primary mission, which is to maintain combat ready units for expeditionary deployment.

Undeveloped forested areas on MCIEAST-MCB CAMLEJ, although primarily classified as operational and training, are also managed for natural resources values and commodity production. Activities range from timber production and management of habitats for native and migratory wildlife, to threatened and endangered species management. Recreational uses of this landscape, including hunting, are a key land use of undeveloped, forested areas aboard MCIEAST-MCB CAMLEJ.

The existing MARSOC complex is located within the Stone Bay area of MCIEAST-MCB CAMLEJ, on the west side of the New River. This area was historically classified as operational and training. The areas upon which the existing complex have been constructed are in the process of being reclassified to administrative/cantonment areas. Forested areas within the Stone Bay area and surrounding current and proposed MARSOC facilities are currently managed as training space, and these areas currently and historically support individual and unit foot-based ground training. Training exercises are conducted throughout the surrounding areas. They are also managed as future habitat for RCW.

Historic aerial photographs of MCIEAST-MCB CAMLEJ where the existing MARSOC complex resides were reviewed dating back to 1938. These photographs indicate that the area was undeveloped and forested. In the 1960s and 1970s the area was heavily used for patrolling and land navigation. A mock Vietnam village was located in the vicinity of TLZ Owl's current location. Blanks were used in training exercises, not live ammunition. A mock Prisoner of War (POW) camp was located closer to NC Highway 210 and there may have been training related items left behind in the woods as a result; but no dud producing ordnance was used (Richardson, 2012a). The area also has historic significance. Captain Stone (namesake for the Stone Bay rifle range) had a homesite located just south of the TLZ Owl current location, and just directly east of the new proposed site. The homesite is recommended eligible for the National Register of Historic Places (NRHP) (Richardson, 2012b).

As shown in Figure 2-1, the MARSOC complex is located near the property line of MCIEAST-MCB CAMLEJ. Land uses to the south of the MARSOC complex are the Everett Creek-Allen property and the Stone's Creek Game lands – Beck tract. The North Carolina Coastal Commission Land Trust manages the Everett Creek-Allen property and the North Carolina Wildlife Resources Commission manages the Stone's Creek Game lands. Winding Creek Airport is also located south of the MARSOC complex. This small, 40 ac (16 ha) airport is privately owned and is comprised of one runway. Land immediately to the west of the MARSOC complex is primarily undeveloped forested areas with a few residences and a high school.

3.1.1.2 Coastal Zone Management Affected Environment

The coastal zone is rich in natural, commercial, recreational, ecological, industrial, and aesthetic resources. As such, it is protected by legislation for the effective management of its resources. The Coastal Zone Management Act (CZMA) of 1972 (16 United States Code [USC] §1451, et seq., as amended) provides assistance to states, in cooperation with federal and local agencies, for developing land and water use programs in the coastal zone.

CZMA policy is implemented through state coastal zone management programs. Federal lands are excluded from the jurisdiction of these state programs. However, activities on federal lands are subject to CZMA federal consistency requirements if the federal activity would affect any land or water or natural resource of the coastal zone, including reasonably foreseeable effects.

The North Carolina Coastal Area Management Act (CAMA) of 1974 was passed in accordance with the federal CZMA. It established a cooperative program of coastal area management between local and state governments. CAMA established the Coastal Resources Commission, required local land use planning in the coastal counties, and provided for a program for regulating development. The North Carolina Coastal Management Program was federally approved in 1978. North Carolina's coastal zone includes the 20 counties that are adjacent to, adjoining, intersected by, or bounded by the Atlantic Ocean or any coastal sound. By definition, the coastal zone extends seaward to the 3 nautical miles (mi) (6 km) territorial sea limit. Onslow County lies within North Carolina's coastal zone and is therefore subject to the CAMA regulations.

As a federal agency, an Installation is required to determine whether its proposed activities would affect the coastal zone. This determination is made in the form of a Negative Determination or as a federal Coastal Consistency Determination. A Negative Determination (along with the basis for the determination) is submitted to North Carolina's program when MCIEAST-MCB CAMLEJ determines that there would be no effects on any coastal uses or resources.

For a proposed activity that would affect coastal resources, a federal Coastal Consistency Determination is required. A federal Coastal Consistency Determination is a determination supported by findings that a proposed activity in, or affecting the resources of the coastal zone, complies with, and would be conducted in a manner that is consistent to the maximum extent practicable with the state's coastal zone enforceable policies unless "…full consistency is prohibited by existing law applicable to the federal government." Therefore, federal actions occurring in a state's coastal zone need to be consistent with that program, specifically the program's enforceable policies. In this case, since the project would be located within the boundary of MCIEAST-MCB CAMLEJ, MCIEAST-MCB CAMLEJ would submit a statement and supporting documentation (i.e., the Coastal Consistency Determination) to the state's program indicating that the action is consistent with the program. The state reviews the determination and either provides concurrence or objection.

There are two tiers of regulatory review for projects within the coastal zone. The first tier includes projects that are located in Areas of Environmental Concern (AECs), which are designated by the state. The second tier includes land uses with the potential to affect coastal waters, even though they are not defined as AECs. These projects are reviewed under the CAMA General Policy Guidelines. Both of these are explained in more detail below.

Areas of Environmental Concern

An AEC is an area of natural importance and its classification protects the area from uncontrolled development. AECs include almost all coastal waters and about three percent of the land in the 20 coastal counties. The four categories of AECs are:

- The Estuarine and Ocean System, which includes public trust areas, estuarine coastal waters, coastal shorelines, and coastal wetlands;
- The Ocean Hazard System, which includes components of barrier island systems;
- Public Water Supplies, which include certain small surface water supply watersheds and public water supply wellfields; and
- Natural and Cultural Resource Areas, which include coastal complex natural areas; areas providing habitat for federal or state designated rare, threatened or endangered species; unique coastal geologic formations; or significant coastal archaeological or historic resources.

General Policy Guidelines

Projects that are located outside of an AEC are reviewed under the General Policy Guidelines. The North Carolina CAMA sets forth 11 General Policy Guidelines, addressing:

- Shoreline erosion policies;
- Shorefront access policies;
- Coastal energy policies;
- Post-disaster policies;
- Floating structure policies;
- Mitigation policy;
- Coastal water quality policies;
- Policies on use of coastal airspace;
- Policies on water and wetland based target areas for military training areas;
- Policies on beneficial use and availability of materials resulting from the excavation or maintenance of navigational channels; and
- Policies on ocean mining.

The purpose of these rules is to establish generally applicable objectives and policies to be followed in the public and private use of land and water areas within the coastal area of North Carolina.

Onslow County Coastal Management Policies

The CAMA requires local governments in each of the 20 coastal counties in the state to prepare, implement, and enforce a land use plan and ordinances consistent with established state and federal policies. Specifically, local policy statements are required on resource protection; resource production and management; economic and community development; continuing public participation; and storm hazard mitigation, post-disaster recovery, and evacuation plans. Upon approval by the North Carolina Coastal Resources Commission, each plan becomes part of the *North Carolina Coastal Management Plan.*

Onslow County adopted its land use plan in conformity with the CAMA in 2000. The county has zoning controls applicable to only one special area, Golden Acres in Stump Sound Township. The county does, however, require review of subdivisions, providing for minimum standards, enforced by the county Planning Department. Incorporated areas within the county implement their own zoning regulations. Onslow County's *Citizen's Comprehensive Plan for Onslow County*, adopted in 2003, also addresses land use planning in relation to the CAMA (Onslow County Planning and Development 2003).

Coastal Resources in the Proposed Project Area

Coastal resources designated as AECs are present at MCIEAST-MCB CAMLEJ, including estuarine coastal waters, coastal shorelines, and coastal wetlands of the Estuarine and Ocean System AEC, as well as habitat for federal or state designated species and archaeological or historic resources of the Natural and Cultural Resource Area AEC. Furthermore, all land located within 75 feet (ft) (23 meters [m]) of the normal high water level of coastal waters and within 30

ft (9 m) of the normal high water level of inland water is also considered to be coastal shoreline within the Estuarine and Ocean System AEC.

Coastal resources are present within the Proposed Action project area, including area designated as future habitat for RCW and palustrine wetlands. No Estuarine and Ocean Systems, Ocean Hazard Systems, Public Water Supplies, unique coastal geologic formations, nor coastal archaeological or historic resources exist in the project area.

3.1.2 Environmental Consequences

3.1.2.1 No Action Alternative

Under the No Action Alternative, additional facilities supporting MARSOC would not be constructed. Therefore, there would be no changes to land use or coastal zone management at MCIEAST-MCB CAMLEJ. The existing boundary between forested and unforested areas at the MARSOC complex would remain the same. Forested areas within the areas proposed for development under the preferred alternative would continue to support training activities and would continue to be managed under the objectives of MCIEAST-MCB CAMLEJ Integrated Natural Resources Management Plan including eventual support of RCW and other species. Prescribed burning would continue to be used to manage threatened and endangered species and wildlife habitat.

3.1.2.2 Proposed Action

Under the Proposed Action, new construction would increase the density of construction in the already built upon areas of the MARSOC complex and an additional area of land would be cleared for development. The construction footprint is approximately 162 ac (66 ha). Land currently considered operational and training would need to be administratively closed for training and reclassified as administrative/cantonment. The Proposed Action would have no effect on land use of adjacent properties outside the boundaries of MCIEAST-MCB CAMLEJ.

Based on the preliminary site plan the Proposed Action would result in about 0.31 ac (0.12 ha) of palustrine forested wetland impacts, (0.13 ac (0.05 ha) of which would be spanned not filled) and 0.11 ac (0.04 ha) of palustrine scrub-shrub wetland impacts. Total area of wetlands impacted would be 0.42 ac (0.17 ha). Mitigation may include but is not limited to evaluating land within the project area or elsewhere on the installation suitable for establishment of wetlands. The use of Department of Defense lands, as well as lands of other entities, would be considered for mitigation purposes when consistent with Environmental Protection Agency, United States Army Corps of Engineers, North Carolina Division of Water Quality guidelines, and permit provisions. MCIEAST-MCB CAMLEJ would obtain the appropriate wetland permits prior to construction, and would implement mitigation as required by wetland permit conditions.

The Proposed Action would not affect any current habitat for threatened and endangered species. MCIEAST-MCB CAMLEJ eventually plans (per existing consultations with the US Fish and Wildlife Service) to support one hundred and seventy three RCW partitions. The Proposed Action would result in the loss of approximately 65 ac (26 ha) of RCW habitat which would result in the loss of one of these future RCW partitions, and would also potentially reduce the viability of the partitions expected to occur adjacent to the lost partition. This reduced viability

would potentially occur due to the reduced potential for genetic transfer between adjacent partitions. However, these impacts would not be expected to interfere with MCIEAST-MCB CAMLEJ recovery goals for RCW; sufficient habitat currently exists elsewhere on MCIEAST-MCB CAMLEJ to absorb and make up for these impacts.

3.2 COMMUNITY FACILITIES AND SERVICES

3.2.1 Childcare Affected Environment

MCIEAST-MCB CAMLEJ currently operates four CDCs to provide child care for the children of DoD military and civilian personnel stationed at or working on-base. In 2009, Marine Corps Community Services completed a CDC requirement study to determine the need for child care on-base and to provide recommendations for CDC siting and capacities at MCIEAST-MCB CAMLEJ. DoD instruction 6060.2, *Child Development Programs*, recommends that the Base provide for 80 percent of the children eligible for child care at on-base facilities. The existing four CDCs at MCIEAST-MCB CAMLEJ are operating at maximum capacity (502 children enrolled) and only serve approximately 12 percent of eligible children. At the time of the CDC requirements study, the existing on-base CDCs had 579 children on the wait list (Department of the Navy, 2010a).

The CDC requirement study recommended that a total of 12 CDCs should be in operation at MCIEAST-MCB CAMLEJ in order to meet the estimated demand for on-base child care (Department of the Navy, 2010a). Five new CDCs are currently under construction and are expected to be operational by 2013.

3.2.2 Childcare Environmental Consequences

3.2.2.1 No Action Alternative

Under the No Action Alternative, additional facilities at the MARSOC complex would not be constructed; however, additional personnel would be assigned to MARSOC complex. There would be a continued shortfall of childcare facilities at MCIEAST-MCB CAMLEJ.

3.2.2.2 Proposed Action

Under the Proposed Action, demand for childcare on MCIEAST-MCB CAMLEJ would be partially met by the construction of a new CDC at the MARSOC complex. The new CDC would provide accommodation for an additional 230 children. There would still be a shortfall of childcare for 1,753 children on-base, which would be addressed with future CDCs located elsewhere on-base property (not within the Stone Bay area) as funding becomes available.

3.3 UTILITIES AND INFRASTRUCTURE

3.3.1 Stormwater Affected Environment

Stormwater runoff, the part of the precipitation, snow melt, or irrigation water that appears in uncontrolled surface streams, rivers, drains, or sewers, can affect surface water quality by depositing sediment, minerals, or contaminants into surface water bodies. Stormwater runoff is

influenced by meteorological factors such as rainfall intensity and duration, and physical factors such as vegetation, soil type, and topography.

Current stormwater requirements by the State of North Carolina were established in 1989 under 15A North Carolina Administrative Code (NCAC) 02H.1000, which was revised in 1995. The regulatory process is initiated when more than an acre of land is disturbed, in which case an Erosion and Sediment Control Plan must be implemented. The North Carolina Division of Water Quality updated the Coastal County Stormwater Rule in 2008 to require permits for projects that exceed 10,000 sf of built-upon area (BUA) within the 20 coastal counties. The update of the rule went into effect on October 1, 2008. The strengthening of the regulation was in response to increased development along North Carolina's coast and subsequent impacts on the environment. In addition, the 2007 Energy Independence and Security Act, Section 438, requires that any federal facility development with a footprint over 5,000 sf use site planning, design, construction, and maintenance strategies for the project to maintain or restore, to the extent practicable, the predevelopment hydrology of the site.

The current stormwater infrastructure at MCIEAST-MCB CAMLEJ includes: drainage ditches and swales, piping networks, curb and gutter conveyance features, and stormwater retention ponds. The NCDENR, Division of Water Quality is the National Pollutant Discharge Elimination System (NPDES) permitting authority, and MCIEAST-MCB CAMLEJ received a NPDES Phase I Stormwater permit in August 2004 and a NPDES Phase II Stormwater permit in February 2011. To prepare for the NPDES Phase II Program, MCIEAST-MCB CAMLEJ developed a comprehensive Stormwater Management Plan to serve as a planning tool (Department of the Navy, 2003). In addition, a Stormwater Pollution Prevention Plan was developed in 2002 that identifies and maps potential pollutant sources that may be reasonably expected to alter the composition of stormwater discharges. These sources include areas of outdoor industrial activity and processes, materials storage areas, loading and unloading areas, construction sites, and waste disposal practices that are exposed to stormwater.

In addition, MCIEAST-MCB CAMLEJ submitted for and received a modified stormwater permit in November 2011 for the construction, operation and maintenance of existing best management practices (BMPs) and BUAs associated with the MARSOC complex. The modifications included a total of 181,285 sf of additional BUA. The permitted modifications are broken down as follows:

- BMP #1 - Added 3,430 sf of BUA (jogging trail). An additional 100 sf of sediment chamber area was taken from the previously permitted sand chamber area.
- BMP #3 - Added a net increase of 5,909 sf of BUA (Milam Clinic Addition). The bypass weir was raised by 0.03 ft to accommodate the additional volume needs.
- BMP #7 - Added 4,266 sf of BUA (Fitness Center Addition). The as-built condition of the filter was added to the permit – sediment basin area at 590 sf and filter area at 7,343 sf, both of which are more than adequate to accommodate the increased BUA.
- BMP #12 - A net reduction of 10,023 sf of BUA (MCIF/GX3/Combat Support Services). This BUA was designated as "Future" on MCIEAST-MCB CAMLEJ's modified permit application. No change to the BMP was required.

- BMP #14- Added 902 sf of BUA (jogging trail). No change to the BMP was required.
- BMP #15 - Added 10,830 sf of BUA (Armory Expansion). No change to the BMP was required.
- BMP #16 - Added 12,174 sf of BUA (Marine Corps Operations School [MSOS] Storage). An additional 144 sf of sediment chamber area was taken from the previously permitted sand chamber area.

The following BUAs were added to the MARSOC complex but are not being treated in a permitted BMP:

- Project 4 - AMMO OPS BLDG - 8,336 sf of BUA
- Project 5 - SERE FACILITY - 9,317 sf of BUA
- Project 6 - SATS PAD - 9,353 sf of BUA
- Project 7 - JOGGING TRAILS - 116,768 sf of BUA

3.3.2 Stormwater Environmental Consequences

3.3.2.1 No Action Alternative

Under the No Action Alternative, there would be no additional development of the MARSOC complex and stormwater management would remain unchanged at MCIEAST-MCB CAMLEJ.

3.3.2.2 Proposed Action

Under the Proposed Action, the increase of up to approximately 5,782,987 sf (537,257 square meters [sq m]) of impervious surfaces would create more stormwater runoff for the long-term. In addition, construction activities would present potential short-term impacts for contamination of stormwater. Existing BMPs, as well as implementation of newly designed BMPs for this project, would be used to avoid contamination of stormwater and mitigate both short-term and long-term impacts.

Short-term practices would include erosion and sediment controls. Erosion and sediment control devices could include sediment fences, silt fences, dust suppressors, and temporary seeding and matting. Long-term BMPs and permanent erosion and sediment control features would be developed as needed for the Proposed Action. Other mitigation measures would include planting grass on bare areas and landscaping in select areas.

As the detailed design for the Proposed Action is developed, appropriate permanent stormwater control measures would be incorporated to ensure that stormwater is managed in accordance with the current MCIEAST-MCB CAMLEJ NPDES stormwater permit and with applicable regulations, and that impacts to surface waters are minimized. Minor impacts would occur to stormwater with the implementation of appropriate BMPs.

3.4 TRANSPORTATION AND TRAFFIC

3.4.1 Affected Environment

The main road in the vicinity of MCIEAST-MCB CAMLEJ is US 17 (Figure 1-1). US 17 runs roughly north-south, connecting Jacksonville with Wilmington, North Carolina 51 mi (82 km) to the south and New Bern, North Carolina 36 mi (58 km) to the north. Local access to the Stone Bay area of MCIEAST-MCB CAMLEJ is provided by NC 210 (Figures 1-2 and 2-1) via Rifle Range Road, a two-lane roadway. Rifle Range Road extends from NC 210 north to Butts Avenue. There is an existing gate along Rifle Range Road that provides access to the property. The intersection of Rifle Range Road and NC 210 operates between Level of Service (LOS) A and C with LOS C occurring on the westbound left lane during the A.M. and P.M. peak hours. These conditions are considered adequate for traffic flow with negligible traffic congestion (MCIEAST-MCB CAMLEJ, 2003). Approximately 700 personnel travel to the Rifle Range each day (NAVFAC MIDLANT, 2006), while another 100 commute to the Special Operations Training Group at Stone Bay (Klotz, 2007). Peak traffic volumes are experienced at the intersection of Rifle Range Road and NC 210 as shooters enter the Stone Bay Rifle Range at 4:30 A.M. and leave at 4:00 P.M. (NAVFAC MIDLANT, 2006).

To ease traffic into the MARSOC complex, the Marine Corps is constructing a half mile long, four lane road between Route 210 and Rifle Range Road. This project began in 2011 and will be completed in the summer of 2013. The Connector Road would intersect Route 210 approximately 1,000 ft (305 m) north of the existing intersection of Rifle Range Road and Route 210, and the existing Rifle Range Road entrance would be closed other than to traffic entering the Marine Federal Credit Union located on the corner of 210 and Rifle Range Road (CATLIN Engineers and Scientists, 2010).

3.4.2 Environmental Consequences

3.4.2.1 No Action Alternative

Under the No Action Alternative, the new entrance into the Stone Bay area would still be constructed (anticipated in the summer of 2013), and the existing Rifle Range Road entrance would be closed. These actions were addressed in the original MARSOC EA (USMC, 2007). A Transportation Impact Analysis was completed in October 2010 for the Connector Road project and the determination was made that the intersection would operate at an LOS C in both A.M. and P.M. peak traffic conditions (CATLIN Engineers and Scientist, 2010; 2011). This analysis is consistent with North Carolina Department of Transportation and the manual and uniform traffic control devices that would be used.

3.4.2.2 Proposed Action

Under the Proposed Action, the increase of 750 personnel to the MARSOC complex would occur between FY 2013 and FY 2015. During construction at the MARSOC complex, traffic volumes in the project vicinity could temporarily increase. Once construction is complete, the traffic volume along NC 210 would permanently increase with increase in personnel driving to

the MARSOC complex each day. There would be additional transportation of goods from the periodic delivery of supplies to the complex.

Under the Proposed Action, as part of the new construction associated with the 2025 MARSOC Facilities Plan, the boat maintenance facility, currently located at Courthouse Bay, would be relocated to the MARSOC complex, on the western side, close to North Carolina Highway (NC) 210. Zodiac boats or Rigid Hulled Inflatable Boats (RHIB) and other small boats would be stored at this facility. The boat maintenance facility is also used for classroom style briefings and instructional training. Under the Proposed Action, the small boats would need to be hauled over to Courthouse Bay or other designated launch area, as there is not an existing launch point at the MARSOC complex. This part of the proposed action is unlikely to substantially add to traffic volume but would potentially cause localized congestion when vehicles are hauling boats to the launch site.

Impacts to other nearby roadways from the increase of personnel at the proposed MARSOC facilities would depend on where they currently reside, and therefore which roadways they would choose to commute in on. While 750 more commuters into the Stone Bay area would increase traffic along 210, the shift in work place for these personnel could result in potential reductions in traffic during daily commuting near MCIEAST-MCB CAMLEJ's main gate and on the mainside (portion of MCIEAST-MCB CAMLEJ that is east of New River).

3.5 NOISE

3.5.1 Affected Environment

Noise is analyzed in this SEA because the Proposed Action would produce construction related increases in noise. No aspects of the Proposed Action would result in increased levels of training related noise beyond that which has been previously predicted in the 2007 MARSOC EA and the 2009 MCIEAST-MCB CAMLEJ Range Operations EA, both of which are publically available upon request and are hereby incorporated by reference.

Noise is one of the most common environmental issues associated with military operations, and encompasses activities such as weapons firing, demolitions, and aircraft operations. Typically, levels of noise are measured in units called decibels (dB). A number of factors affect how the human ear perceives sound: the actual level of noise, frequency, period of exposure, and fluctuations in noise levels during exposure. Since the human ear cannot perceive all pitches or frequencies equally well, these measures are adjusted or weighted to compensate for the human lack of sensitivity to low-pitched and high-pitched sounds. This adjusted unit is known as the A-weighted decibel, or dBA. Vehicular noise resulting from aircraft and vehicle activities is expressed in terms of dBA. The dBA is therefore used for evaluating noise sources related to traffic, small boats, and aircraft. The A-weighting scale closely resembles the frequency response of the human ear and therefore is considered to provide a good indication of the impact of noise from the proposed project.

The USMC uses land use planning guidelines and zone definitions, developed by the Department of the Army, to describe land use compatibility with relation to noise:

- Noise Zone I – acceptable for noise sensitive land uses.
- Noise Zone II – normally not recommended for noise sensitive land uses.
- Noise Zone III – not recommended for noise sensitive land uses (USACHPPM, 2005).

The most recent noise study completed for MCIEAST-MCB CAMLEJ is included in the 2009 EA for MCIEAST-MCB CAMLEJ Range Operations. Modeling conducted for this EA analyzed existing and future base-wide small and large caliber weapons noise contours (USMC, 2009). In this study, C-weighted Day-Night Level (CDNL) contours were predicted using the Army BNOISE2 computer model after applying a 20 percent growth factor to 2004-2006 weapon operational and expenditure data. It was expected that using this 20 percent growth factor would account for training of additional personnel associated with Marine Corps force size increases predicted to occur by 2011. This modeling included the original (USMC, 2007) proposed location for the breacher facility. According to the contours of the 2009 EA CDNL at or greater than 70 dBC (Noise Zone III) are predicted to occur mostly within the Base. However, portions of the New River are included within these contours. No off-base land areas are within Noise Zone III. CDNL at or greater than 62 dBC but less than 70 dBC (Noise Zone II) are predicted to occur mainly within the Base. Exceptions include the southern edge of the Noise Zone II contour which extends into the Sneads Ferry and Dixon communities.

MCIEAST-MCB CAMLEJ periodically evaluates noise conditions from Base training operations, such as the 2009 noise modeling included in the Range EA. The results of these noise evaluations, specifically off-base noise impacts, are coordinated with the local government, Onslow County, along with land use recommendations. These recommendations include: providing disclosure of noise zones on all sales of existing residences, instituting noise reduction construction requirements for any new schools, churches, or hospitals built in Noise Zone I, restricting the construction of any new schools, churches, or hospitals within Noise Zone II, and instituting noise reduction construction requirements for new residences constructed in Noise Zone II

There are no noise sensitive receptors, such as residential areas, schools, hospitals, churches, and other similar facilities within the project area. Off-base, approximately 0.9 mi (1.5 km) west of the MARSOC complex, there is a small development community, Manchester Estates, with approximately 14 residences. Several other residences are scattered along NC 210, west of the MARSOC complex. Another developed community is located more than 0.8 mi (1.3 km) to the south of the MARSOC complex. Dixon High School is more than 2.1 mi (3.3 km) from the training facilities within the MARSOC complex.

MCIEAST-MCB CAMLEJ has established quiet hours (12:00 a.m.-6:00 a.m. plus Sundays 6:00 a.m.-12:00 p.m.) during which firing of large caliber weapons and demolitions is normally prohibited. Demolition training would cease one hour prior to sunset unless special authorization is given by Range Control. Demolition training occurring at night would be limited to ½ the allowable daytime limit, and only upon request and approval through Range Control. At no time would demolition training be authorized with explosive weights exceeding 50 pounds (23 kilograms). In an effort to be more responsive to the needs of its neighbors, the USMC has established a noise complaint hotline at MCIEAST-MCB CAMLEJ. The line is available 24 hours a day, seven days a week. The noise complaint hotline number is (910) 451-9079.

3.5.2 Environmental Consequences

3.5.2.1 No Action Alternative

Under the No Action Alternative, construction at the MARSOC complex would not occur and existing noise conditions at MCIEAST-MCB CAMLEJ would remain unchanged from baseline conditions.

3.5.2.2 Proposed Action

Noise Zone II contours expand approximately 656 ft (200 m) south beyond MCIEAST-MCB CAMLEJ into the Stone Creek area. Several residential sites in Stone Creek, immediately adjacent to the MCIEAST-MCB CAMLEJ boundary, are slightly impacted by the increased noise. Noise Zone III contours do not extend past the MCIEAST-MCB CAMLEJ boundary and encircle the breacher facility and several other training facilities including: the shoothouse, the urban trainer, the rappelling tower, etc.

Under the Proposed Action, noise would be generated during the construction phases of the project and also from military training that would be conducted at TLZ Owl. Construction activities that would impact community noise levels include noise from construction equipment operating at the site and construction/delivery vehicles traveling to and from the site. Noise levels at a given receptor location would depend on the type and number of pieces of construction equipment being operated and the receptor's distance from the construction site. Small increases in noise levels along the truck routes would be expected as a result of the operation of delivery trucks and other construction vehicles. Noise impacts would vary widely, depending on the phase of construction and the specific task being undertaken. Phases of construction that would generate noise include: land clearing and excavations, foundation and capping, erection of structural steel, and construction of exterior walls. Increased noise levels would be greatest during the early stages of each construction phase, although these periods would be of short duration. Under these circumstances, the noise generated would be similar to noise generated by other construction projects on MCIEAST-MCB CAMLEJ.

Operations associated with TLZ Owl were analyzed in the August 2007 Environmental Assessment for the Marine Special Operations Command Complex. The existing TLZ Owl has regular operations and is located approximately 3,051 ft (930 m) from the closest off-base sensitive land uses. The Proposed Action would not alter the operations at TLZ Owl; only relocate the TLZ to one of four proposed locations (Figure 2-1) or to an expanded TLZ Vulture. Noise from helicopter operations at any of the new TLZ Owl alternative locations could be noticeable at off-base noise sensitive receptor sites, but would be at a sufficient distance to make it unlikely that more than a small percentage of people would find the noise an annoyance. TLZ Owl placement Alternatives 1 and 4 are approximately 3,000 ft (914 m) from a few residences to the southwest. Alternative 2 would locate the TLZ closest to the MARSOC complex boundary and close to Highway 210 (approximately 500 ft (152 m) east of Highway 210). Alternative 2 is approximately 2500 ft (762 m) from Dixon Elementary School. Alternative 3 is approximately 3,000 ft (914 m) northeast of residences in Stone Creek. TLZ Vulture is over 4500 ft (1372 m) from the base boundary and even further to any residences or other sensitive noise receptors.

Table 3.5-1 provides the available maximum noise levels for typical helicopters (Rylander, 1988). The percent of population that could be highly annoyed by these noise levels is summarized in Table 3.5-2. Based on limited studies of helicopter noise, about 13 percent of people are highly annoyed by helicopter noise within 2,000 ft (610 m) depending on the type of helicopter (Rylander, 1974). None of the proposed locations for the relocation of TLZ Owl are within 2,000 feet of the property line and therefore the potential for any of these locations to impact the human use or enjoyment of off-base areas is minimal. It typically requires approximately 100 helicopter operations daily to produce a Noise Zone II contour (65 A-weighted Day-Night Level [ADNL]). Operations at the new TLZ Owl location would not exceed 100 operations a day, even if the expansion of TLZ Vulture is selected and the operations of both TLZs were combined, and in fact range usage data shows typically much less. Moreover, approach and departure routes from the TLZ would be planned to avoid overflight of neighborhood residential areas and schools.

Table 3.5-1 Maximum Noise Levels (dBA) of Typical Helicopter

Slant Distance (ft)	CH-47D	UH-1	UH-60
200	98	91	91
1,000	83	76	76
2,000	77	70	69
5,000	67	60	58
Source: Rylander et al., 1988.			

Table 3.5-2 Percentage of Population Highly Annoyed from Helicopter Noise

Maximum Noise (dBA)	Percentage Highly Annoyed
70	5
75	13
80	20
85	28
Source: Rylander et al., 1974.	

3.6 AIR QUALITY

3.6.1 Affected Environment

The Clean Air Act regulates "criteria pollutants." They are: particulate matter (PM) 10 microns in diameter or less, or PM_{10}; particulate matter 2.5 microns in diameter or less, or $PM_{2.5}$; ground-level ozone (O_3); carbon monoxide (CO); sulfur oxides; nitrogen oxides (NO_x); and lead (Pb). These pollutants can cause health hazards, harm the environment, and cause property damage. PM_{10}, $PM_{2.5}$, and ground-level O_3 are the most widespread health threats.

Particle pollution, which includes both PM_{10} and $PM_{2.5}$, consists of very fine dust, soot, smoke, and droplets that are formed from chemical reactions. It is also produced when fuels such as coal, wood, or oil are burned. For example, sulfur dioxide (SO_2) and NO_x gases from motor vehicles, electric power generation, and industrial facilities react with sunlight and water vapor to form particles. Particles may also come from fireplaces, wood stoves, unpaved roads, and crushing and grinding operations, and may be blown into the air by the wind.

Ground-level O_3 is a primary component of smog. Ground-level O_3 can cause human health problems and damage forests and agricultural crops. The two types of chemicals that are the main ingredients in forming ground-level O_3 are volatile organic compounds (VOCs) and NO_x. VOCs are released by cars burning gasoline, petroleum refineries, chemical manufacturing plants, and other industrial facilities. The solvents used in paints and other consumer and business products contain VOCs. NO_x is produced when cars and other sources like power plants and industrial boilers burn fuels such as gasoline, coal, or oil. The reddish-brown color sometimes seen when it is smoggy comes from NO_x.

The United States Environmental Protection Agency (USEPA) calls these pollutants "criteria" air pollutants because it regulates them by developing human health-based and/or environmentally-based criteria (science-based guidelines) for setting permissible levels. These guidelines are collectively called the National Ambient Air Quality Standards (NAAQS). The NAAQS set a primary and, in some cases, a secondary standard for each of the criteria pollutants. The primary standards are limits based on human health. The secondary standards are another set of limits intended to prevent environmental and property damage. A geographic area with air quality that is cleaner than the primary standard is called an "attainment" area; areas that do not meet the primary standard are called "nonattainment" areas. These primary and secondary standards are listed in Table 3.6-1. The NCDENR has an additional standard for total suspended particulates (TSP), which is also included in Table 3.6-1.

Table 3.6-1 National and North Carolina Ambient Air Quality Standards

Pollutant	**Average Time**	**Primary[a]**	**Secondary[a]**
Ozone (O_3)	8 Hours	0.075 ppm [b]	Same as Primary
Carbon Monoxide (CO)	8 Hours	9.0 ppm	None
	1 Hour	35 ppm	
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.053 ppm	Same as Primary
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	0.03 ppm	None
	24 Hours	0.14 ppm	
	3 Hours	---	0.5 ppm

Particulate Matter (PM_{10})	24 Hours	150 $\mu g/m^3$ [b]	Same as Primary
Particulate Matter ($PM_{2.5}$)	Annual	15 $\mu g/m^3$	Same as Primary
	24 Hours	35 $\mu g/m^3$	
Lead (Pb)	Quarterly Arithmetic Mean	0.15 $\mu g/m^3$ [c]	Same as Primary
North Carolina TSP Standard	24 hours	150 $\mu g/m^3$	--
	Annual Geometric Mean	75 $\mu g/m^3$	--

Notes:
a: These standards, other than for O_3 and those based on annual averages, must not be exceeded more than once per year. The O_3 standard is attained when the expected number of days per calendar year with a maximum hourly average concentration above the standard is equal to or less than one.

b: ppm = parts per million by volume, $\mu g/m^3$ = micrograms per cubic meter.

c: The 0.15 $\mu g/m^3$ standard is effective 1/12/2009 and replaces the previous level of 1.5 $\mu g/m^3$.
Source: USEPA 2002, NCAC 1981

In addition to the criteria pollutants, the Clean Air Act regulates Hazardous Air Pollutants (HAPs) and Greenhouse Gases (GHGs). The National Emission Standards for Hazardous Air Pollutants regulates 188 HAPs based on available control technologies. Examples of HAPs include benzene, which is found in gasoline; perchlorethlyene, which is emitted from some dry cleaning facilities; and methylene chloride, which is used as a solvent and paint stripper. Off-gassing of HAPs may also occur from new construction and furnishings. The majority of HAPs are VOCs.

GHGs are gases that trap heat in the atmosphere. These emissions occur from natural processes and human activities. The accumulation of GHGs in the atmosphere regulates the earth's temperature. Scientific evidence indicates a trend of increasing global temperature over the past century due to an increase in GHG emissions from human activities. The most common GHGs emitted from natural processes and human activities include carbon dioxide, methane, and nitrous oxide. Combustive emission sources are a prime source of these GHG emissions.

EO 13514, announced on October 8, 2009, directs and specifies timelines for federal agencies to report, inventory, and reduce GHG emissions; improve water use efficiency and management; promote pollution prevention and eliminate waste; advance regional and local integrated planning; implement high performance sustainable federal building design, construction, operation and management, maintenance, and demolition; advance sustainable systems acquisition; promote electronic stewardship; and sustain environmental management (74 Federal Register 52117). Due to its global nature, GHG emissions are assessed under Cumulative Impacts (Section 5.0).

The region of influence for air quality for this EA is defined as the Southern Coastal Plain Intrastate Air Quality Control Region (defined in 40 CFR Part 81.151). This Air Quality Control Region includes the North Carolina counties of Brunswick, Carteret, Columbus, Craven, Duplin, Greene, Jones, Lenoir, New Hanover, Onslow, Pamlico, Pender, and Wayne.

As per 40 CFR Part 70.3 and 15A North Carolina Administrative Code (NCAC) 02Q.0101, MCIEAST-MCB CAMLEJ is a major source of air pollutants and maintains a Title V permit.

3.6.2 Environmental Consequences

3.6.2.1 No Action Alternative

Under the No Action Alternative, the proposed additional construction at the MARSOC complex would not occur and existing air quality conditions at MCIEAST-MCB CAMLEJ would remain unchanged. Similarly, the Southern Coastal Plain Intrastate Air Quality Control Region is expected to remain in attainment for all criteria pollutants.

3.6.2.2 Proposed Action

Under the Proposed Action, minor and temporary impacts to the local air quality would occur due to the planned construction activities. The use of heavy duty diesel equipment for site preparation and development would result in air emissions, primarily NO_x and PM.

Table 3.6.-2 presents the air emissions calculated to occur for the Proposed Action construction and compares them to the Onslow County mobile source emission inventory for 2002, which is the most current year for which these data are available.

Table 3.6-2. Emission from Mobile Sources Due to the Proposed Action Construction Compared to the 2002 Onslow County Mobile Source Emission Inventory.

	Emissions				
	VOC	**CO**	**NO_x**	**SO_2**	**PM**
Construction-Related Activity (total tons)	35	218	381	50	36
2002 Mobile Source Inventory (tons per year)	3,606	3,912	34,650	458	185

The total air emissions associated with construction for the Proposed Action are well below the mobile source inventory for Onslow County, and the largest estimated emission (NO_x) is at 381 tons over the life of the project. Thus, the Proposed Action would result in negligible air emissions and would not have an adverse impact on the air quality of the region.

Operation of the proposed new facilities would not generate significant air emissions. In addition, the relocation of TLZ Owl would not be any different than the existing TLZ operation. Operationally, there would be no impacts to air quality. Refer to Appendix C for air quality modeling calculations.

3.7 TERRESTRIAL RESOURCES

3.7.1 Topography and Soils Affected Environment

Topography

MCIEAST-MCB CAMLEJ is characterized by a combination of poorly drained broad, level flatlands and gently rolling better-drained terrain. Topography at MCIEAST-MCB CAMLEJ is characterized by high ground elevations (with the highest elevation at about 72 ft [22m]) (MCIEAST-MCB CAMLEJ, 2007). More specifically, the MARSOC complex has relatively high elevations (ranging from 10 ft to 60 ft) and areas of steep topography, particularly adjacent

to waterways and wetlands. Within the MARSOC complex, a series of high ground elevations intersect at various locations by lower lying drainage ravines (Department of the Navy, 2012a). Figure 3-1 shows the topography of the MARSOC complex.

Soils

Soil descriptions at the MARSOC complex are provided in Table 3.7-1. The terraces are primarily composed of Baymeade fine sand and Baymeade-Urban land complex while the slopes are composed of Marvyn loamy fine sand grading to Muckalee loam along the tributaries of the New River. The Bohicket series occurs along a tributary to Everett Creek. Smaller inclusions of Leon, Pactolus, Goldsboro and Kureb soils are also represented in the MARSOC complex (USDA NRCS, 2009; Department of the Navy, 2012a; b). See Figure 3-2 for a depiction of the soils at the MARSOC complex.

At the proposed project sites, Baymeade fine sand and Marvyn loamy fine dominate many of the construction areas. Kureb fine sand and Leon fine sand are also found in the areas proposed for projects 1395, 1396, 1394, and 1288. Muckalee loam predominates around streams north and south of the proposed location for projects 1218 and 1219 (USDA NRCS, 2009). The Alternative 1 and Alternative 4 placement for TLZ Owl is located in Baymeade fine sand. Alternative 2 is located in Baymeade fine sand, Kureb fine sand and Leon fine sand. Alternative 3 is located in both Baymeade fine sand and Marvyn loamy fine.

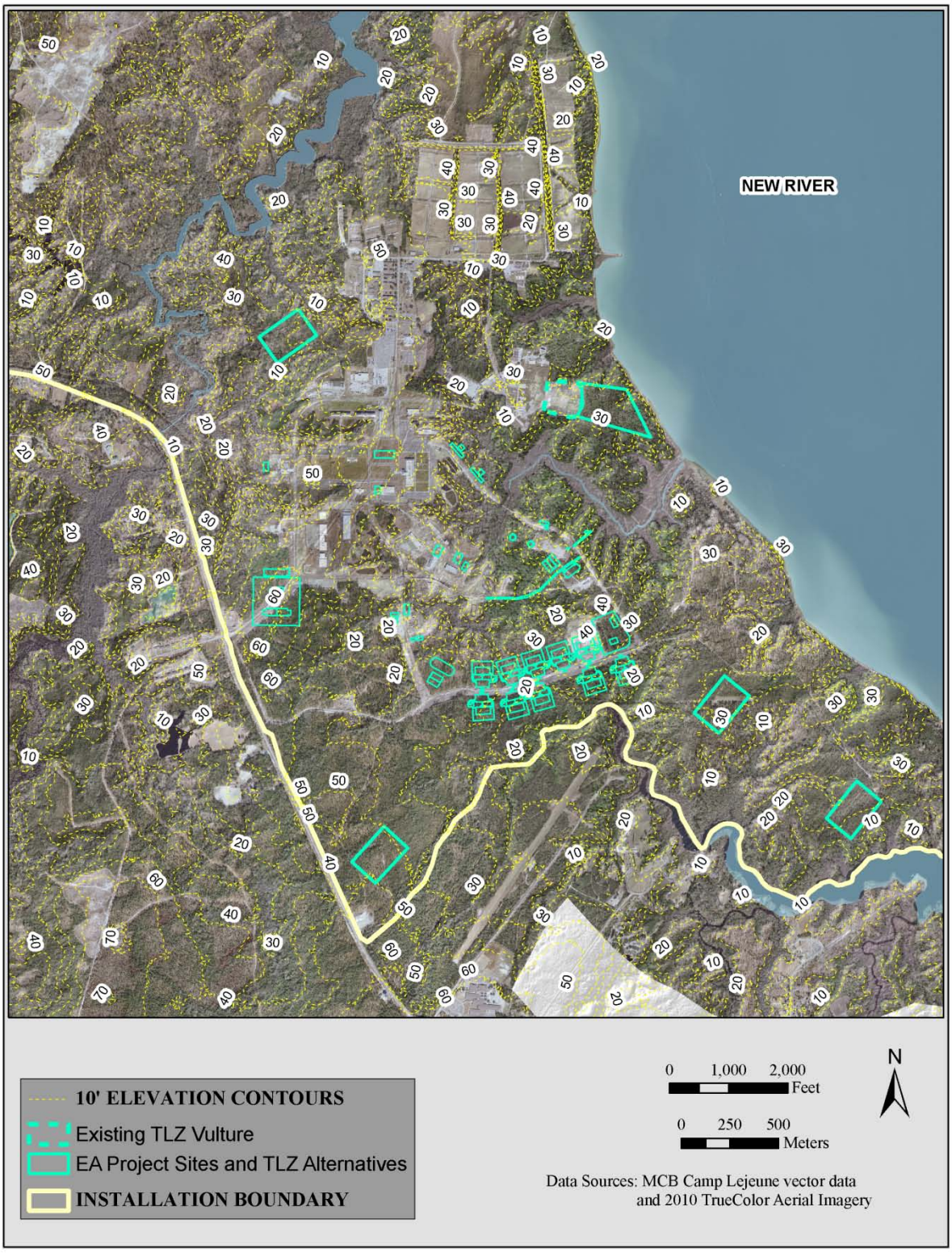


Figure 3-1 Topography of the MARSOC Complex

Figure 3-2 Soils at the MARSOC Complex

Table 3.7-1 Soils Series Descriptions

Soil Series	Description
Baymeade fine sand (BaB)	A well-drained soil that occurs on nearly level slopes of 0 to 6 percent is characterized by rapid infiltration, slow runoff, moderately rapid permeability, and low available water capacity. This soil provides a good support base for most building structures.
Baymeade-Urban land complex (BmB)	The Baymeade series consists of deep, well drained soils with moderately rapid permeability. They formed in loamy and sandy marine sediments of the lower Coastal Plain. Slopes range from 0 to 12 percent.
Bohicket clay loam (Bo)	Characterized as a nearly level, poorly drained soil occurring in tidal marshes, this silty clay loam is flooded daily making it unsuitable for most non-recreational human uses.
Goldsboro fine sandy loam (GoA)	Characterized as a very deep, moderately well drained soils with moderate permeability on lower to upper coastal plains. Slopes range from 0 to 10 percent.
Kureb fine sand (KuB)	The Kureb series consists of very deep, excessively drained, gently sloping to moderately steep soils on Coastal Plain uplands and on side slopes along streams and bays. They have formed in marine, aeolian, or fluvial sands. Slopes range from 0 to 20 percent.
Leon fine sand (Ln)	A nearly level, poorly drained, acidic, upland soil is composed of a fine sand with infiltration and permeability rapid in the surface layer and moderate in the subsoil. Surface runoff is slow and as is available water capacity. With a seasonally high water table at or near the surface, it is not ideal for building site development.
Marvyn loamy fine sand (MaC)	This loamy fine sand occurs in well-drained areas on short side slopes of 6 to 15 percent. It is characterized with moderate infiltration, medium runoff, moderate permeability, and moderate available water capacity. The slopes associated with the Marvyn soils are the major limitation affecting site development.
Muckalee loam (Mk)	This loam occurs on nearly level, poorly drained soils on flood plains. It is characterized by moderate infiltration, very slow surface runoff, and moderate permeability. This soil is frequently flooded for brief periods and is generally not used for site development.
Pactolus fine sand (Pa)	This fine sand occurs in moderately well to somewhat poorly drained areas on short slopes of 0 to 6 percent. It is characterized with slow surface runoff and rapid permeability.
Source: USDA NRCS, 2009.	

3.7.2 Topography and Soils Environmental Consequences

3.7.2.1 No Action Alternative

Under the No Action Alternative, construction at the MARSOC complex would not occur and existing topography, and soil profiles in the project area would remain unchanged.

3.7.2.2 Proposed Action

Minor impacts to the existing topography would occur during clearing and grading as a result of the proposed construction activities at the MARSOC complex. During construction soils at the sites would be impacted through clearing, grading, compaction, and potential erosion. Erosion impacts would be temporary and would be minimized by employing applicable soil erosion and sedimentation control techniques at the construction sites. Prior to construction, approval would be obtained by NCDENR on all Erosion and Sediment Control (ESC) plans for the different phases of the project. ESC devices that would be used include sediment fencing, silt fencing, curb inlet protection, dust suppressors, temporary seeding, and matting (NAVFAC MIDLANT, 2007). All of the soil to be impacted would eventually be covered with impervious surfaces or vegetation, including the proposed relocated TLZ, preventing long-term erosion.

Excavation and replacement of hydric soils on-site may be required, with suitable fill material trucked in for construction. Ditching or additional drainage measures would also be required to alleviate the high water table that exists at the construction site.

3.7.3 Vegetation Affected Environment

MCIEAST-MCB CAMLEJ encompasses approximately 92,300 ac (37,352 ha) of forest, 17,300 ac (7,001 ha) of non-forested land, 5,059 ha (12,500 ac) of impact areas, and 26,000 ac (10,522 ha) of the New River. All forested areas on the Base are managed by MCIEAST-MCB CAMLEJ's Forest Management Program. The Forest Management Program staff is responsible for all timber harvests associated with timber management and construction projects involving the removal of merchantable timber. MCIEAST-MCB CAMLEJ contributes 40 percent of the net proceeds from the sale of timber products to the Onslow County Schools System in accordance with 10 U.S.C. 2665. Fire also plays a deciding role in the communities of MCIEAST-MCB CAMLEJ, affecting canopy and understory density and species composition.

On the western portion of MCIEAST-MCB CAMLEJ where the MARSOC complex and proposed new construction is located, the landscape is characterized by pine savannas. The most common of the savannas in this area is the loblolly pine (*Pinues taeda*) with several species of hardwoods including the black gum (*Nyssa sylvatica*), sweet gum (*Liquidambar styraciflua*), southern red oak (*Quercus falcata*), white oak (*Quercus alba*), and red maple (*Acer rubrum*). The shrub layer varies with wetness, but generally consists of wax myrtle (*Myrica cerifera*), blue huckleberry (*Gaylussacia frondosa*), and sparkleberry (*Vaccinium arboreum*). Groundcover species vary with the degree of land disturbance and fire regimes, but can include wiregrass (*Aristida stricta*), bracken fern (*Pteridium aquininum*), and bluestems (*Schizachyrium spp*.), along with more disturbance tolerant species like greenbriar (*Smilax spp*.) and broomsedge (*Andropogon virginicus*).

3.7.4 Vegetation Environmental Consequences

3.7.4.1 No Action Alternative

Under the No Action Alternative, construction at the MARSOC complex would not occur and existing vegetation in the project area would remain unchanged. MCIEAST-MCB CAMLEJ's Forest Management Program would continue to manage vegetation in the area including through pine regeneration and prescribed burning per the goals of the current Integrated Natural Resources Management Plan (INRMP).

3.7.4.2 Proposed Action

The majority of the MARSOC complex project area is forested. Under the Proposed Action, development of facilities would take place on roughly 162 ac (66 ha) of the MARSOC complex. Based on conceptual design layout, implementing the Proposed Action would result in the removal of up to approximately 139 ac (56 ha) of forested habitat within the 162 ac area to be developed within the larger MARSOC complex proposed project area.

The project area contains merchantable timber. After clearing, this acreage would be permanently removed from future timber production and adjacent areas that remain forested would be more difficult to manage due to increased fragmentation and also due to the MARSOC mission, which would restrict access within the forests around the new structures, particularly within the MARSOC fenceline.

3.7.5 Wildlife Affected Environment

Wildlife within the forested areas around the MARSOC complex is typical of that found in the southeastern Coastal Plain of North Carolina. As the habitat around the MARSOC complex has become increasingly surrounded by off and on base development it is reasonable to expect that the wildlife community utilizing the forests has changed to more edge and urban area adapted species. Mammals commonly found include white-tailed deer (*Odocoileus virginianus*), eastern gray squirrel (*Sciurius carolinensis*), eastern cottontail (*Sylvilagus floridanus*), opossum (*Didelphis virginiana*), southern flying squirrel (*Glaucomys volans*), and raccoon (*Procyon lotor*). Some reptiles and amphibians, from the diminutive pine wood snake (*Rhadinaea flavilata*) to the oak toad (*Bufo quercicus*), may also be found in the area.

Common bird species include mourning dove (*Zenaida macroura*), northern bobwhite quail (*Colinus virginianus*), mockingbird (*Mimus polyglottos*), American robin (*Turdus migratorius*), catbird (*Dumetella carolinensis*), and various sparrows (*Fringillidae*) and warblers (*Parulidae*). Pairs of osprey (*Pandion haliaetus*) occupy nests scattered along the shores of the New River and its larger tributaries. Virtually all birds that may occupy the proposed project site throughout the year are protected under the Migratory Bird Treaty Act (MBTA). The MBTA of 1918 is the primary legislation in the U.S. established to conserve migratory birds. The MBTA prohibits the taking, killing, or possessing of migratory birds unless permitted by regulation. Migratory birds are viewed as a shared resource, and collaboration with other nations (Canada, Mexico, Russia, and Japan) is aimed at cooperatively protecting this resource. Eastern North Carolina hosts a wide array of migratory birds because it is part of the Atlantic Flyway. Additionally, within

eastern North Carolina there are 10 National Wildlife Refuges aimed to preserve the natural environment and protect areas from the impact of human behavior.

The DoD operates under a Memorandum of Understanding with the U.S. Fish and Wildlife Service (USFWS) for MBTA coordination on activities, such as the Proposed Action, that are not specifically related to military readiness. The Memorandum of Understanding states that the DoD shall accomplish the following prior to starting any activity that is likely to affect populations of migratory birds:

1. Identify the migratory bird species likely to occur in the area of the Proposed Action and determine if any species of concern could be affected by the activity;

2. Assess and document, through the project planning process, using NEPA when applicable, the effect of the Proposed Action on species of concern; and

3. Engage in early planning and scoping with the USFWS relative to potential impacts of a Proposed Action, to proactively address migratory bird conservation, and to initiate appropriate actions to avoid or minimize the take of migratory birds.

The Memorandum of Understanding points to several regional reports and plans to identify species of concern. USMC biologists compiled these reports and used them to prepare a list of the migratory bird species of concern that could potentially occupy the habitat provided in the area of the Proposed Action. This list is provided in Appendix D of this SEA.

A multi-species scientific management strategy is used to maintain habitat requirements for several game and non-game species within MCIEAST-MCB CAMLEJ. Game species include eastern wild turkey (*Meleagris gallopavo*), white-tailed deer, black bear (*Ursus americanus*), squirrel (such as eastern gray squirrel), northern bobwhite quail, eastern cottontail, raccoon, wood duck (*Aix sponsa*), largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), red-ear sunfish (*Lepomis miniatus*), and channel catfish (*Ictalurus punctatus*). Non-game species under management plans include the eastern bluebird (*Sialia sialis*), purple martin (*Progne subis*), least tern (*Sterna antillarum*), various neo-tropical migrant birds, and a variety of reptiles and amphibians (MCIEAST-MCB CAMLEJ, 2007).

3.7.6 Wildlife Environmental Consequences

3.7.6.1 No Action Alternative

Under the No Action Alternative, construction at the MARSOC complex would not occur. Wildlife habitat occurring in the areas around the MARSOC complex would not change, and wildlife occurring in these habitats would continue to experience the current level of disturbance from occasional use of these forestlands for training purposes. Prescribed burning would continue.

3.7.6.2 Proposed Action

The Proposed Action would result in minor, adverse impacts to wildlife. The removal of palustrine forested wetland and mixed pine and hardwood forest habitat at the proposed project

site would cause forest dwelling birds, mammals, reptiles, and amphibians to be permanently displaced once the land is cleared. Less mobile species at the project area would experience direct mortality. Wildlife residing in the periphery of the proposed construction sites may be temporarily displaced as a result of the noise and activity of the construction. The Proposed Action would remove up to 139 ac (56 ha) of forested habitat and up to 0.42 ac (0.17 ha) of wetland habitat, 0.13 ac (0.05 ha) of which would be spanned not filled, and 225 linear ft (69 m) of stream would be impacted, but would not adversely affect species abundance or stability at the population level.

There could be minor impacts to movement of wildlife species in the vicinity of the project site as a result of implementing the Proposed Action. Additional fencing would pose new restrictions to wildlife movement and use of the remaining habitat.

As previously stated, the DoD operates under a Memorandum of Understanding with the USFWS for MBTA coordination on activities, with specific requirements placed on the DoD when proposed actions are likely to affect migratory birds. MCIEAST-MCB CAMLEJ has identified the migratory bird species that have the potential to occur in the vicinity of the Proposed Action. These species are listed in Appendix D of this SEA. MCIEAST-MCB CAMLEJ has determined that the Proposed Action addressed within this SEA would have minor impacts to migratory birds, and that this impact would occur due to destruction of habitat. Population level effects would not occur because the Proposed Action area represents a small portion of the habitat available on a base-wide and regional basis. Therefore, the Proposed Action would be compliant with the intent of the Memorandum of Understanding and implementation of the Proposed Action would not require prior coordination with the USFWS regarding MBTA issues.

3.7.7 Threatened and Endangered Species Affected Environment

The Endangered Species Act (ESA) of 1973 and subsequent amendments provide for the conservation of threatened and endangered species of animals and plants, and the habitats in which they are found. The ESA prohibits jeopardizing endangered and threatened species or adversely modifying critical habitats essential to their survival. Section 7 of the Act requires consultation with the National Marine Fisheries Service (NMFS) and the USFWS to determine whether any endangered or threatened species under their jurisdiction may be affected by the Proposed Action (MCIEAST-MCB CAMLEJ, 2007). The USMC ensures that consultations are conducted as required with USFWS and NMFS under Section 7 for any action which "may affect" a threatened or endangered species according to guidance provided in the Environmental Compliance and Protection Manual, Marine Corps Order P5090.2A (MCIEAST-MCB CAMLEJ, 2007).

3.7.7.1 Federally-Listed Species

MCIEAST-MCB CAMLEJ is home to several Federally-listed threatened and endangered species. MCIEAST-MCB CAMLEJ's threatened and endangered species program focuses on protection, management, and monitoring of the Federal and State-listed species found at the Base which are listed in Table 3.7-2 (MCIEAST-MCB CAMLEJ, 2007). No designated critical habitat is located on MCIEAST-MCB CAMLEJ. The proposed project site likely does not support

habitat for the Federal and State-listed species in Table 3.7-2, with the exception of forested areas designated as future habitat for RCW.

Table 3.7-2. Federal and State-listed Species Known to Occur or Potentially Occurring at MCIEAST-MCB CAMLEJ

Type	Latin Name	Common Name	Federal Listing	State Listing	Habitat
Plants	*Amaranthus pumila*	Seabeach amaranth	T	E	Seabeach amaranth habitat is comprised of beaches on barrier islands.
	Asplenium heteroresiliens	Carolina Spleenwort	FSC	E	Carolina Spleenwort habitat is comprised of small depressions on vertical or high angle faces of marl outcrops in the Coastal Plain.
	Carex lutea	Golden Sedge	E	E	Golden Sedge prefers the ecotone between the pine savanna and adjacent wet hardwood or hardwood/conifer forest.
	Calopogon multiflorus	Many-flower Grass Pink	FSC	E	Many-flower grass pink habitat is comprised of sandy, relatively dry pine savannas and grasslands.
	Cystopteris tennesseenisis	Tennessee Bladder-fern	NA	E	Tennessee Bladder-fern is found on stream terraces or in deep soils.
	Dichanthelium hirstii	Hirsts' Panic Grass	C	E	Hirst's panic grass grows in areas that are periodically inundated with water under a sparse tree canopy.
	Lophiola aurea	Golden Crest	NA	E	The golden crest inhabits savannas.
	Lysmachia asperulifolia	Rough-leaved Loosestrife	E	E	Rough-leaved loosestrife generally occurs in the ecotones between longleaf pine uplands and pond pine pocosins on moist to seasonally saturated sands and on shallow organic soils overlaying sand. Occurs on MCIEAST-MCB CAMLEJ.
	Muhlenbergia torreyana	Pinebarren Smokegrass	NA	E	Pinebarren Smokegrass inhabits moist, peaty pine barrens and meadows.
	Myriophyllum laxum	Loose Watermilfoil	FSC	T	Loose Watermilfoil habitat includes limesink ponds and rarely other freshwater pools.
	Parnassia caroliniana	CarolinaGrass-of-Parnassus	NA	E	Carolina Grass-of-Parnassus inhabits savannahs of the lower Coastal Plain.
	Plantago sparsiflora	Pineland Plantain	FSC	E	Pineland Plantain habitat is in wet savannas and occasionally along roadsides and ditches over calcareous substrates.
	Platanthera integra	Yellow Fringeless Orchid	NA	T	Yellow Fringeless Orchid habitat includes savannahs, swamps, and wet flatwoods of the coastal plain.
	Rhexia aristosa	Awned Meadow-beauty	FSC	T	Awned Meadow-beauty habitat is clay-based Carolina bays, depression meadows, and limesink ponds, but it may also be found in savannahs and low pinelands.
	Solidago pulchra	Carolina Goldenrod	NA	E	Carolina Goldenrod prefers habitat adjacent to coastal wetlands.
	Solidago verna	Spring-flowering Goldenrod	FSC	SR	Spring-flowering goldenrod habitats include pine savannas, pocosins, and pine barrens.

Type	Latin Name	Common Name	Federal Listing	State Listing	Habitat
Plants	*Solidago villosicarpa*	Coastal Goldenrod	FSC	SC	Coastal goldenrod prefers habitat adjacent to coastal wetlands.
	Thalictrum cooleyi	Cooley's Meadowrue	E	E	Cooley's Meadowrue grows in fire-maintained, moist to wet bogs and savannas, roadside ditches, power line rights-of-way, and clearings in forests that are vegetated by grasses.
	Utricularia olivacea	Dwarf Bladderwort	NA	T	Dwarf Bladderwort habitat consists of ponds.
Fish	*Acipenser brevirostrum*	Shortnose Sturgeon	E	E	Shortnose sturgeon inhabits rivers and estuaries.
Birds	*Aimophila aestivalis*	Bachman's Sparrow	FSC	SC	Bachman's Sparrow inhabits open, grassy pine or oak woods.
	Charadrius meladus	Piping plover	T	T	Piping plover habitat is comprised of intertidal wash zones with adjacent foraging areas.
	Haliaeetus leucocephalus	Bald Eagle[2]	NA	T	Bald eagles live near rivers, lakes, and marshes.
	Mycteria americana	Wood Stork	E	E	Wood storks nest in colonies, especially in forested swamps. They feed in farm ponds, flooded pastures, tidal pools, or anywhere with shallow water where small fish may be concentrated.
	Passerine ciris	Painted Bunting	FSC	NA	The Painted Bunting is found in thickets, woodland edges and brushy areas, along roadsides, in suburban areas, and gardens.
	Picoides borealis	Red-cockaded Woodpecker	E	E	Red-cockaded woodpecker habitat is comprised of open pine stands with trees that are at least 60 years old. Occurs on MCIEAST-MCB CAMLEJ.
	Ryncops niger	Black Skimmer	NA	SC	Black skimmers nest on open sandy beaches, inlets, sandbars, offshore islands, and dredge disposal islands that are sparsely vegetated and contain shell fragments.
	Sterna nilotica	Gull-billed Tern	NA	T	Gull-billed Terns forage over marshes, pastures, farms, and other open coastal areas. They nest and breed on gravelly or sandy beaches and islands, and winters in salt marshes, estuaries, lagoons, and plowed fields; less frequently along fresh-water areas
	Calidrus canutus	Red Knot	C	NA	During the non-breeding season, Red knots are found in intertidal, marine habitats, especially near coastal inlets, estuaries, and bays that support horseshoe crabs. Breeding occurs in arctic habitats.
Mammals	*Balaena glacialis*	Northern right whale	E	NA	Northern right whales prefer subtropical to subpolar waters on the continental shelf edge and slope worldwide.
	Balaenoptera borealis	Sei whale	E	NA	Sei whales prefer subtropical to subpolar waters on the continental shelf edge and slope worldwide.

Type	Latin Name	Common Name	Federal Listing	State Listing	Habitat
Mammals	*Balaenoptera physalus*	Fin whale	E	NA	Fin whales are found in all the world's major oceans, in waters ranging from the polar to the tropical
	Corynorhinus rafinesquii	Rafinesque's Big-eared Bat	FSC	T	Rafinesque's Big-eared Bat habitat includes hollow trees, caves, and abandoned buildings along river systems and other permanent bodies of water, particularly in regions associated with old growth forests.
	Megaptera novaeangliae	Humpback whale	E	NA	Humpback whales live at the surface of the ocean, both in the open ocean and shallow coastline waters.
	Neotoma floridana floridana	Eastern Woodrat	NA	T	The eastern woodrat prefers deciduous forests. In the Coastal Plain, the eastern woodrat may be found in lowland forests, swamps, marshes, grasslands, and abandoned buildings.
	Puma concolor couguar	Eastern Cougar	E	E	Eastern cougar habitat is comprised of trees, bluffs, and shrubs.
	Physeter catodon	Sperm whale	E	NA	Sperm whales tend to inhabit areas with a water depth of 1968 ft (600 m) or more, and are uncommon in waters less than 984 ft (300 m) deep.
	Tichecehus manatus	Manatee	E	E	Manatees can be found in shallow, slow-moving rivers, estuaries, saltwater bays, canals and coastal areas. Occurs within the New River.
Amphibians	*Rana capito capito*	Carolina Gopher Frog	FSC	T	Carolina gopher frogs inhabit scattered localities in the Sandhills and southeastern Coastal Plain. They depend on fishless ponds for breeding. Occurs within New River tributaries.
Reptiles	*Alligator mississippiensis*	American alligator	T(S/A)	T	American alligators live in wetlands.
	Caretta caretta	Loggerhead sea turtle	T	T	Loggerhead sea turtle habitat is comprised of oceanic zones, shallow or coastal waters, and beaches. Nest on MCIEAST-MCB CAMLEJ.
	Chelonia mydas	Green sea turtle	T	T	Green sea turtles habitat is comprised of oceanic zones and beaches. Nest on MCIEAST-MCB CAMLEJ.
	Crotalus adamanteus	Eastern Diamondback Rattlesnake	NA	E	Eastern Diamondback Rattlesnake habitat includes pine flatwoods, brushy fields along forest margins, and drier pocosins.
	Crotalus horridus	Timber Rattlesnake	NA	SC	Timber rattlesnake habitat includes rocky hillsides, fields along forests, river valleys and swamps, low pinewoods, and pocosins.
	Dermochelys coriacea	Leatherback turtle	E	E	Leatherback sea turtle habitat is composed of open ocean and beaches.
	Eretmochelys imbricata	Atlantic hawksbill turtle	E	E	Occur in the waters off the coast.

Type	Latin Name	Common Name	Federal Listing	State Listing	Habitat
Reptiles	*Heterodon simus*	Southern Hognose Snake	FSC	SC	Southern Hognose Snakes inhabit xeric communities with coarse sands or porous loamy soils including sandhills and pine and wiregrass flatwoods.
	Lepidochelys kempii	Kemp's Ridley turtle	E	E	Occur in the waters off the coast.
	Malaclemys terrapin centrata	Carolina Diamondback Terrapin	FSC	SC	The Carolina Diamondback Terrapin is found in tidal channels of sounds and estuaries that are bordered primarily by *Spartina* spp.
	Micrurus fulvius	Eastern Coral Snake	NA	E	Eastern Coral Snake habitat includes sandy flatwoods, maritime forests, and sandhills with pines, scrub oaks, and wiregrass.
	Ophisaurus mimicus	Mimic Glass Lizard	FSC	SC	Mimic Glass Lizard habitat includes longleaf pine savannas and wooded areas that are dominated by pines.
	Sistrurus miliarius	Pygmy Rattlesnake	NA	SC	Pygmy Rattlesnake habitat is composed of pine flatwoods and sandy, open woodlands with pines, wiregrass, and scrub oaks, and is frequently near cypress ponds and other bodies of water.

C=Candidate for Listing
E=Endangered
FSC=Federal Species of Concern
NA=Not applicable
S/A=Similarity of Appearance
SC=Species of concern
SR=Rare Species
T=Threatened

3.7.7.2 Other Species at Risk

In addition to the federally-listed threatened and endangered species mentioned above, several additional species at risk may occur at MCIEAST-MCB CAMLEJ. According to MCIEAST-MCB CAMLEJ's INRMP, the Base defines species at risk as those species that are not federally-listed, but are a conservation concern because of several factors including the species' rarity, proportion of the species population occurring on MCIEAST-MCB CAMLEJ, and the potential of the species to impact training missions if it were to become listed (MCIEAST-MCB CAMLEJ, 2007). MCIEAST-MCB CAMLEJ may protect populations of species at risk by designating conservation areas as defined in the Protected Species Base Order (BO 5090.11) where such restrictions do not negatively impact training. Additionally, MCIEAST-MCB CAMLEJ works with the North Carolina Natural Heritage Program on pilot programs designed to proactively manage coastal goldenrod *(Solidago villosicarpa),* a federal species of concern. There are no coastal goldenrod *(Solidago villosicarpa*) populations within the proposed project site.

3.7.8 Threatened and Endangered Species Environmental Consequences

3.7.8.1 No Action Alternative

Under the No Action Alternative, additional facilities supporting MARSOC would not be constructed. Protected species and their habitats would continue to be managed under MCIEAST-MCB CAMLEJ's Threatened and Endangered Species Management program for conservation and recovery in accordance with all environmental laws, regulation, and terms and conditions in applicable USFWS biological opinions. Prescribed burning would continue to be used to manage the future RCW partitions in the forested areas south of the current MARSOC developed area, with less complication than would occur if the Proposed Action goes forward. The No Action Alternative would avoid the loss of one future RCW cluster and secondary impacts to adjacent future clusters.

3.7.8.2 Proposed Action

The Proposed Action would result in the loss of future RCW habitat and one future RCW partition (currently unoccupied but expected to be in the future based on MCIEAST-MCB CAMLEJ recovery goals and planning). Figure 3-3 depicts the future RCW habitat for the MARSOC complex. Not all of the forest within the Proposed Action area is considered suitable habitat; this decision is based on soils and vegetation primarily. Up to 65 ac (26 ha) of RCW future habitat would be directly lost from construction of buildings and structures and the replacement of TLZ Owl. Roughly 30 of the 65 ac lost would be from the partition within which P1218 and P1219 are proposed for construction. This estimate includes only the direct footprint of the buildings and structures and does not include cleared, graded areas around these structures, and therefore underestimates the actual acreage lost. However, for the purposes of discussion, using only the 30 ac (12 ha) figure, this referenced partition would only have 116 ac (47 ha) remaining after construction of the proposed projects. The 116 ac would be fragmented and therefore of reduced value. In addition, the newly constructed adjacent structures would make management of these acres for RCW (particularly through prescribed burning) very difficult. Therefore, the Proposed Action is expected to result in the loss of this partition. The remaining

35 ac (14 ha) lost would be from two other partitions. While this rough estimate underestimates the true acreage that would be lost, enough habitat is expected to remain in these partitions for the RCW to continue to be successful in the future.

The Proposed Action would not adversely affect any other Federally-listed threatened or endangered species, as none are known to occur in the proposed project areas. There would be a loss of forested wetland habitat, but the habitat does not support threatened or endangered species populations, with the exception of forested areas designated as future habitat for RCW, nor is it expected to be habitat suitable for known threatened and endangered species that occur at MCIEAST-MCB CAMLEJ.

As described previously, several other species at risk, including state protected species, have the potential to occur at MCIEAST-MCB CAMLEJ. However, none are known to occur within the proposed project site based on habitat requirements of the species.

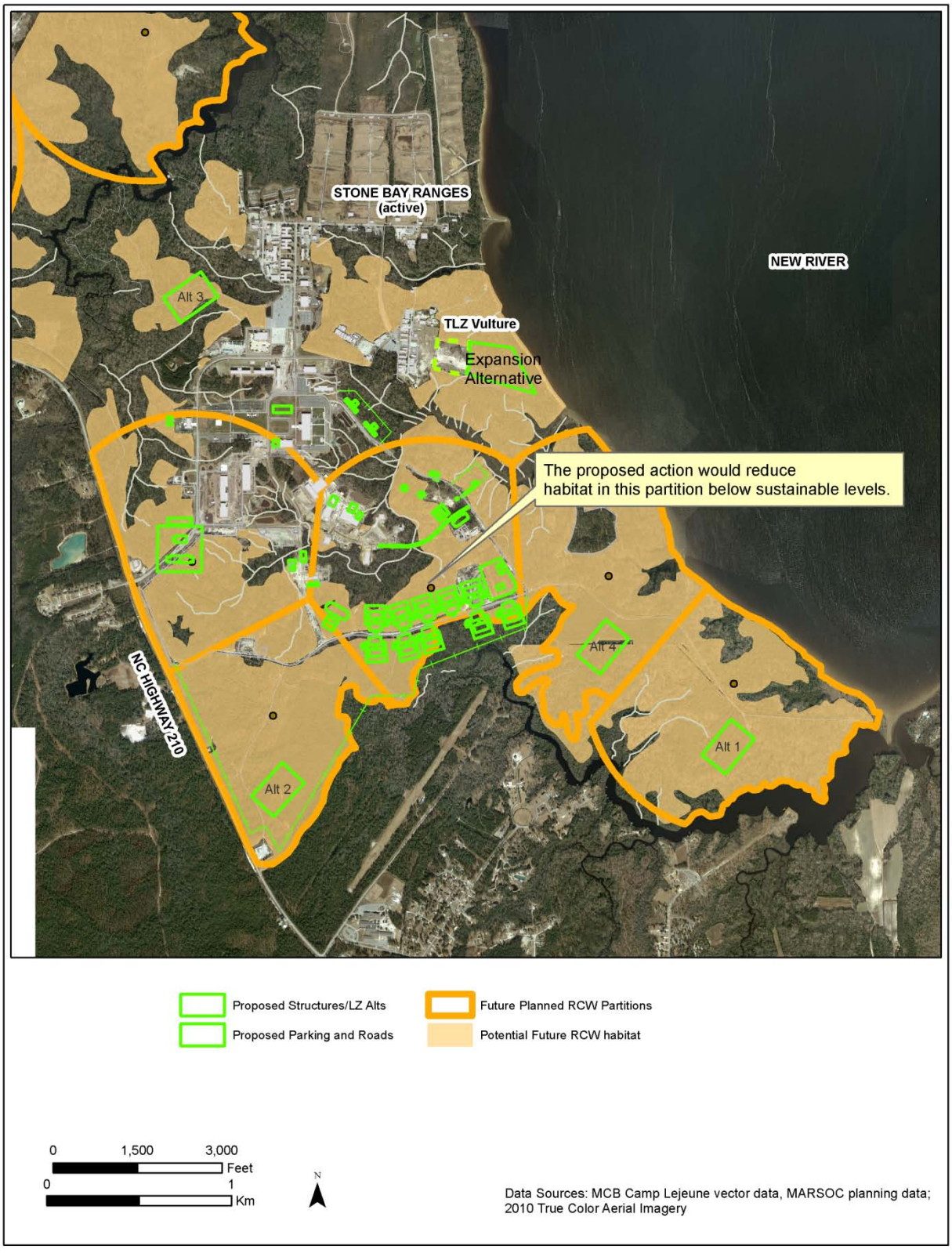


Figure 3-3 MARSOC Complex Natural Resources Constraints

3.8 WATER RESOURCES

3.8.1 Affected Environment

Surface Water

Surface water features near the proposed MARSOC Complex include Stone Creek to the northwest, an unnamed tributary to the east, and Everett Creek to the southeast. These three creeks flow into the New River (Figure 3-4). Ephemeral and intermittent/perennial streams can be found throughout the project area in association with wetlands (Figure 3-4).

The state of North Carolina has assigned water quality classifications for surface waters based on the existing and contemplated "best usage" for which the waters must be protected. Class SA waters receive the highest rating for tidal waters and are suitable for shell fishing and any of the uses specified for SB and SC classifications. The intermediate rating for tidal waters is Class SB, waters suitable for primary recreation and other uses as specified by the SC classification. Class SC waters are suitable for aquatic life propagation and survival, fishing, wildlife, and secondary recreation (15A NCAC 02B).

In addition to these principal water quality classifications, NCDENR has applied supplemental classifications to describe other attributes of the water bodies. The term "nutrient sensitive waters" (NSW) identifies streams, creeks, and rivers that show decreased fish populations, decreased ambient dissolved oxygen, increased frequency of fish kills, and increased algae concentrations. "High quality waters" (HQW) are waters rated as excellent based on biological or physical/chemical characteristics (15A NCAC 02B).

The North Carolina Marine Fisheries Commission has further designated certain estuarine areas as "nursery areas" to protect the habitat for juvenile populations of economically important commercial fish species. Nursery areas provide food, cover, suitable substrate, and appropriate salinity and temperature for young finfish and crustaceans over a major portion of their initial growing season (15A NCAC 3N). Primary nursery areas are located in the upper portions of creeks and bays. These areas are usually shallow with soft muddy bottoms and surrounded by marshes and wetlands. Low salinity and the abundance of food in these areas is ideal for young fish and shellfish (NCDMF, August 2006). "Special secondary nursery areas" are located adjacent to "secondary nursery areas" but closer to the open waters of our sounds and the oceans. The majority of the year when juvenile species are abundant, these waters are closed to trawling.

Stone Creek

Stone Creek flows northeast through an area that is undeveloped. Stone Creek is classified as SA waters and is suitable for shell fishing and any of the uses specified for SB and SC classifications. The creek has the additional designation of HQW (15A NCAC 02B) (NCDENR, DWQ, August 2006) and it is a primary nursery area. Stone Creek flows into the New River north of Stone Bay.

Unnamed Tributary

This unnamed tributary within the MARSOC Complex is located south of Stone Creek and north of Everett Creek. It flows east into New River and is considered a primary nursery area.

Everett Creek

Everett Creek flows southeast into New River. Everett Creek is classified as SA waters and is suitable for shell fishing and any of the uses specified for SB and SC classifications. The creek has the additional designation of HQW (15A NCAC 02B) and is considered a primary nursery area (NCDENR, DWQ, 2006*).*

New River

The New River and its watershed are located entirely within Onslow County. The upper reaches of New River and its tributary streams are narrow with flowing freshwater. The lower reaches are estuarine waters, which are wider, slow moving, poorly circulating, and affected by tides. Within the tidal portions of the New River, water quality classifications range from SA to SC. Within the New River estuary, all waters downstream from Grey Point to the New River Inlet at the Atlantic Ocean are classified as SA, with the exception of two areas of SC waters around the historic outfalls for the Rifle Range and the old Courthouse Bay wastewater treatment plants (NCDENR, DWQ, 2006). Since these outfalls have been removed, the DWQ and the NC Department of Environmental Health are pursuing reclassification of these waters to Class SA (NCDENR, DWQ, 2001). All waters draining to the New River north of Grey Point are considered NSW. The New River and most tributary streams of the New River south of the City of Jacksonville have the additional designation of HQW (15A NCAC 3N.0002) and primary nursery areas (15A NCAC3N.0002).

Groundwater

Groundwater is defined as subsurface water contained within aquifers. Groundwater aquifers are usually relatively deep under the ground surface. All of Onslow County, including MCIEAST-MCB CAMLEJ, falls within the freshwater portion of the Castle Hayne aquifer. This aquifer is surficial, or unconfined, in that it overlies deeper aquifers confined by clay sediments. The Castle Hayne aquifer ranges from 6 to 1,105 ft in thickness, with an average depth of 164 ft (50 m). Composed of limestone, sandy limestone, and sand, it is the most productive aquifer in North Carolina with wells typically producing 200-500 gallons per minute, but can exceed 2,000 gallons per minute (NCDENR, 2012).

Wetlands and Floodplains

Executive Order (EO) 11990, *Protection of Wetlands*, directs federal agencies to take action to minimize the destruction, loss, or degradation of wetlands on their property and mandates review of proposed actions on wetlands through procedures established by NEPA. It requires that federal agencies establish and implement procedures to minimize development in wetlands. In support of the Navy's goal of "no net loss of wetlands," all Navy/Marine Corps construction and operational actions must avoid adverse impacts to, or destruction of, wetlands. If this is

impossible, then designs shall be made to minimize wetland degradation and shall include mitigation to replace impacted wetlands in another location.

Development is proposed for roughly 162 ac (66 ha) within the existing MARSOC complex area (Figure 3-4). A much broader area, 1,857 ac (752 ha), was previously field surveyed to determine wetland boundaries. USACE, Wilmington District personnel field verified the delineated wetland boundaries at Stone Bay on July 31 and August 1, 2006. There were 345 wetland ac (19 percent) delineated in the 1,857 ac wetland field survey area. Of the total wetland acres delineated, 248 ac (72 percent) were forested wetlands, and 50 ac (14 percent) were estuarine, forested and emergent wetlands. There were 47 ac (19 ha) (14 percent) classified as palustrine scrub-shrub broad-leaved evergreen wetlands. Additionally, approximately 16,076 ft (4,900 m) of linear wetlands, mostly palustrine scrubshrub, broad-leaved evergreen, were identified.

Executive Order 11988, *Floodplain Management*, sets forth the responsibilities of federal agencies for reducing the risk of flood loss or damage to personal property, minimizing the impacts of flood loss, and restoring the natural and beneficial functions of floodplains. This order was issued in furtherance of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. Floodplains and flood hazard zones are generally present throughout MCIEAST-MCB CAMLEJ near the New River and its creeks and estuaries.

Floodplains are present in the project area near the New River, Stone Creek, Everett Creek, and an unnamed tributary of the New River, as MCIEAST-MCB CAMLEJ includes approximately 10,522 ha (26,000 ac) of water within the New River Basin. The 100-year floodplain for Stone Creek extends southwestward into the MARSOC project area. Similarly, the 100-year floodplain for Everett Creek extends into the general area of the MARSOC complex.

3.8.2 Environmental Consequences

3.8.2.1 No Action Alternative

Under the No Action Alternative, construction at the MARSOC complex would not occur. Surface water, groundwater, wetlands and floodplains conditions would remain the same with regard to site development at MCIEAST-MCB CAMLEJ. The No Action Alternative would avoid the loss of 0.42 acres of jurisdictional wetlands.

3.8.2.2 Proposed Action

Surface Water

Implementation of the Proposed Action would not likely have adverse effects on surface water resources, but any impacts that did occur would be minimized through the use of BMPs. As described previously, a wetlands delineation was conducted that identified approximately 7,200 linear ft (2,195 m) of relatively permanent water (RPW) features connecting the wetlands located in the Proposed Action area. To the maximum extent practicable, final design layouts for the additional facilities and roads at the MARSOC complex would avoid and/or minimize impacts to the RPWs located near the Proposed Action area. It is unlikely any impacts to these RPW would occur.

Construction activities could result in a temporary increase in runoff and total suspended particulate matter to surface water both within and near the proposed project areas. In addition, a net increase in less pervious surface cover would occur following construction of the new facilities. This would result in an associated increase in stormwater discharge.

In order to minimize impacts to surface water due to stormwater runoff and erosion, MCIEAST-MCB CAMLEJ would adhere to standards and BMPs contained in the Installations' Stormwater Pollution Prevention Plan. During construction activities associated with the Proposed Action, appropriate BMPs to control erosion and sedimentation would be implemented.

Ground Water

The Proposed Action would not result in adverse impacts to groundwater resources, as construction would not disturb the underlying Castle Hayne Aquifer. However, construction could impact shallower groundwater through site drainage improvements in adjacent uplands. Ditching or other drainage measures may be required to alleviate the high water table at the proposed construction area. There are no water supply wells within the vicinity of the project site.

Wetlands and Floodplains

The Proposed Action would result in additional jurisdictional wetland impacts at the MARSOC complex. The proposed construction projects would impact jurisdictional wetlands as follows:

Table 3.8-1 Jurisdictional Wetland Impacts Due to Proposed action

PROJECT #	ACRES IMPACTED	TYPE	NOTES
P1391	0.13 ac (0.05 ha)	Riparian, palustrine forested, broad-leafed	0.13 ac (225 ft [69m] of stream) would be spanned not filled
P1218	0.18 ac (0.07 ha)	Riparian, palustrine forested, broad-leafed	n/a
P1394	0.11 ac (0.04 ha)	Non-riparian, palustrine scrub-shrub, broad-leafed	n/a
TOTAL	**0.42 ac (0.17 ha)**		

The proposed projects would avoid, to the maximum degree feasible, impacts to wetlands and surface waters regardless of wetland size or legal necessity for a permit, including adherence to the MCIEAST-MCB CAMLEJ policy of maintaining a minimum setback of 50 ft from wetlands wherever possible. Each project within the Proposed Action would undergo full design, wetlands to the maximum extent practicable. Mitigation for unavoidable impacts that remain would be achieved through on site mitigation, or through compensatory mitigation through a wetland mitigation bank, as agreed upon through permit coordination with the Environmental Protection Agency, United States Army Corps of Engineers, and North Carolina Division of Water Quality.

Wetland protection measures as outlined in the *Memorandum of Agreement Between the Department of the Army and the Environmental Protection Agency, The Determination of*

Mitigation under the Clean Water Act Section 404 (b)(1) Guidelines (USACE and USEPA, 1990) would be followed:

- Avoidance - avoid potential impacts to the maximum extent practicable;
- Minimization - take appropriate and practicable steps to minimize the adverse impacts (e.g., limit the anticipated impact to an area of the wetland with lesser value than other areas, or reduce the actual size of the impacted area);
- Compensatory mitigation - take appropriate and practicable compensatory mitigation action for unavoidable adverse impacts that remain after all appropriate and practicable minimization has been made (e.g., create a new wetland area, restore existing degraded wetland, or enhance low value wetland).

The Proposed Action is not located directly within the 100-year floodplain boundary. The Proposed Action involves only minor changes to topography; no changes to current floodplain boundaries are expected to result.

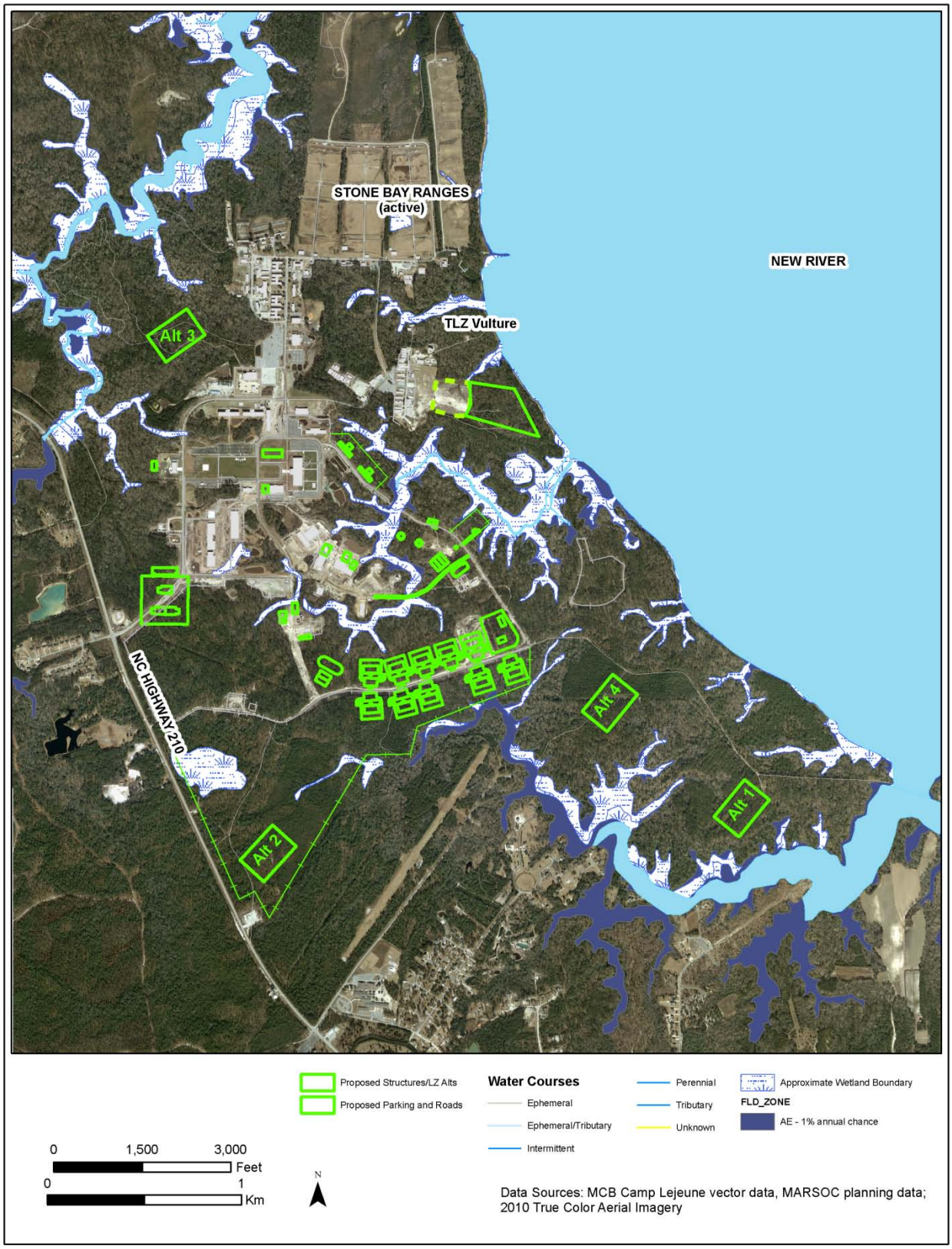


Figure 3-4 MARSOC Complex Water Resources Constraints

3.9 CULTURAL RESOURCES

3.9.1 Affected Environment

The 2007 MARSOC EA addressed the demolition of nine National Register of Historic Places (NRHP) eligible structures in the Stone Bay Rifle Range Historic District. It also addressed construction of four new buildings within the Historic District, and rehabilitation of three buildings that had been determined to be contributing elements to the Historic District. During consultation with the State Historic Preservation Office (SHPO) it was determined that demolition of these structures was an adverse affect to NRHP eligible contributing resources, but that the proposed action would not adversely affect the Historic District as a whole. The consultation also established guidelines for future construction within the Historic District. To date five of the nine eligible structures have been demolished (Officers Quarters RR39-RR43). MCIEAST-MCB CAMLEJ subsequently determined that demolition of the other structures was not necessary and there are no current plans to demolish them. The 2007 MARSOC EA also discussed four NRHP potentially-eligible archaeological sites. After further assessment only one was found to be eligible and the current proposed action would not affect this site.

One NRHP eligible archaeological site is located south of TLZ Owl's current location, and directly west of alternative site #4 for TLZ Owl relocation. Archaeological site 31ON1599/1599**[1] represents a multi-component prehistoric camp and an eighteenth century historic home site location. Historic period artifacts recovered from the site span a date range from the early-through-late 1700's, and may be associated with the home site of Captain William. H. Stone, an early New River settler, surveyor and landholder for whom Stone Bay was named. This archaeological site is recommended eligible for the NRHP (Richardson, 2012b).

3.9.2 Environmental Consequences

3.9.2.1 No Action Alternative

Under the No Action Alternative, construction at the MARSOC complex would not occur and existing cultural resources in the project vicinity would remain unchanged.

3.9.2.2 Proposed Action

No cultural resources impacts are expected from the current proposed action, either to archaeological or historic architectural resources. No construction or demolition is proposed within the Historic District. No construction is proposed in the area of any NRHP eligible archaeological site. Alternative TLZ Owl site #4 is near the home site as discussed above. The boundaries of the TLZ would not overlap the site and therefore no direct impacts are expected. Foot traffic in the surrounding woods could potentially increase because of the proximity of the

[1] This site has both prehistoric and historic components and the /1599** designates the historic component. If the site only had prehistoric components, the site number would be 31ON1599. The numerical designation is based on the Smithsonian system, where 31 indicates the 31st state for archaeological site designations, ON indicates the county, and 1599 indicates the site's sequential recording in the county.

new TLZ if this alternative were chosen. Base environmental staff reviews all training events that include digging or other ground disturbing activities per established review procedures that apply throughout the Base; avoidance of impacts to the site would be ensured through this process.

3.10 HAZARDOUS MATERIALS AND WASTE/INSTALLATION RESTORATION

3.10.1 Affected Environment

3.10.1.1 Hazardous Materials Management

Hazardous materials and hazardous wastes are managed in accordance with Base Order 5090.9, *Hazardous Waste and Hazardous Material Management Program.* Personnel involved in any aspect of hazardous waste management are trained in safety and compliance regulations. MCIEAST-MCB CAMLEJ has an Installation Hazardous Waste Management Program, in which standard operating procedures are outlined for the handling and disposal of hazardous waste (MCIEAST-MCB CAMLEJ, 1999).

The various departments and divisions within MCIEAST-MCB CAMLEJ generally order hazardous materials through the supply system. Some materials are purchased through outside vendors. Implementation of the Hazardous Material Management System has helped reduce the amount of hazardous materials purchased. Excess or shelf-life expired hazardous materials are brought to EMD's Resource Conservation and Recovery Section for characterization. These materials are recycled or reused if possible, or disposed of, mostly through the Defense Logistics Agency Disposition Services (MCIEAST-MCB CAMLEJ, 2005).

3.10.1.2 Installation Restoration Program Sites

Installation Restoration (IR) Site 69, the Rifle Range Chemical Dump, is located to the east of the MARSOC complex project area (Figure 3-5). IR Site 69 is approximately 14.8 ac (6 ha) in size. IR Site 69 has a reported history of chemical weapon munitions (CWM) disposal; specifically chemical agent identification sets (CAIS). CAIS are small glass vials, ampoules or bottles which contain small amounts of chemical warfare agents or industrial chemicals once used as training devices by all branches of the United States military to help soldiers identify and decontaminate chemical warfare agents in combat. Most of the CAIS were recalled in the late 1970's and early 1980's and destroyed; however, some of the remaining CAIS were either used for training or disposed of by burial. The glass vials and bottles can be found packed in their original storage and shipping containers, or they may be loose in the soil. The suspected CWM of concern at IR Site 69 are primarily CAIS. Although CAIS should be considered dangerous and should not be touched or picked up, due to the remote location of IR Site 69 and that the site is secured by engineering controls (i.e., perimeter fence), the site is considered a low priority for CWM issues, as determined by the U.S. Army Corps of Engineers. Training exercises are conducted throughout the surrounding areas.

IR Site 68, a miscellaneous debris dump site, is located within the MARSOC complex north of the project area, and is less than 5 ac (2 ha) in size. Two investigations have been conducted at IR Site 68. The National Oil and Hazardous Substances Pollution Contingency Plan states that

sites which the USEPA determines to need no additional evaluation are given a "No Further Response Action Plan (NFRAP)" designation within the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund) Information System (CERCLIS). Through this designation, no supplemental investigation or remediation work would be performed at the site unless new information is presented indicating that the initial decision was not appropriate. This No Further Action Decision Document presents the pertinent information that supports the conclusion that no evidence exists to suggest that the soil, groundwater, surface water, or sediment are sufficiently contaminated to pose a threat to human health. Even though there is no evidence to suggest that site media pose a potential health risk at IR Site 68, land use and aquifer use controls are in place due to the elevated inorganics.

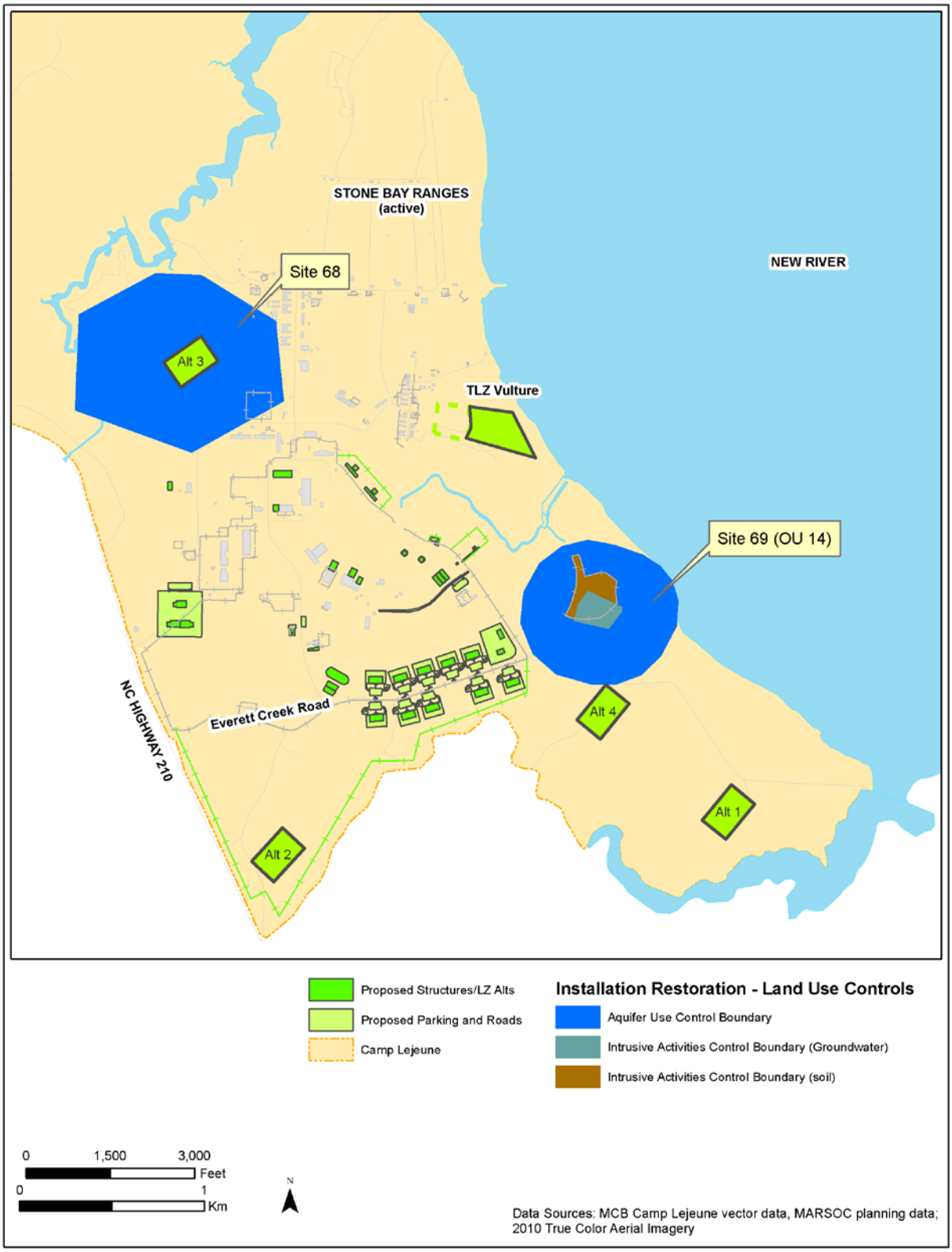


Figure 3-5 MARSOC Complex IR Site Constraints

3.10.1.3 Historic and Active Ranges at MARSOC

MCIEAST-MCB CAMLEJ would propose to close all areas affected by construction in and around the MARSOC area to future training use. This is known as an administrative closure. A site may be administratively closed when it is determined and documented that there has been no known munitions use and the site has been developed or would be developed so as to be incompatible with training. Assessment and cleanup activities under the MMRP are required for closed ranges where a history of munitions use is known or suspected. All range closures must be submitted to and approved by the Marine Corps Training and Education Command and the Marine Corps Installation Command.

The historic ranges in the area of the Stone Bay rifle range and the MARSOC complex, depicted on Figure 3-6, are based on the USACE 2001 range archive report (USACE, 2001). The rectangular area shown as the rifle range on Figure 3-6 is proposed for administrative closure due to the absence of evidence of any firing or use having ever occurred in this area. This area is believed to have been an alternate location considered, and ultimately decided against, for placement of the rifle range.

Figure 3-6 also depicts two historic Gun Positions (GP)s, 41A and 41B, both of which have been assessed under the MMRP as site UXO-16, and both of which were determined to require no further action. Figure 3-6 shows an additional potential GP described in the USACE 2001 range archive report (USACE, 2001) as potentially occurring near the current position of TLZ Owl. This suspected GP warrants investigation and possible inclusion into the MMRP; this would be addressed before any construction would be allowed to occur on the site. A historic Unnamed Explosive Contaminated Range (UXO-02) is shown on Figure 3-6 and is being managed as an active MMRP site.

Other historic ranges in the Stone Bay range included; a Mortar Range created in March 1946 for the purpose of firing 60 mm and 81mm mortars that was discontinued for use in 1947; a Machine Gun Transition Range that extended over the northern portion of the MARSOC complex that appears on 1953 and 1954 base maps that is assumed to have been used for small arms and is no longer is use; and a 1,000 Inch Range, authorized for use of .22 Caliber rifles, .45 Caliber pistols and submachine guns, that extended over the New River east of the MARSOC complex, which first appears on a 1953 range map and was discontinued for use in 1963.

In the 1960s and 1970s what is now the MARSOC complex was heavily used for patrolling and land navigation. A mock Vietnam village was constructed in the vicinity of TLZ Owl's current location. Live ammunition was not used during training. There was also a (mock) Prisoners of War (POW) camp closer Highway 210. As a result, training related items may be left in the woods; however, no dud producing ordnance was used during training (Richardson, 2012a).

The active Stone Bay ranges are directly north of the current and proposed development areas for MARSOC. The Rifle Range was originally approved in December 1941, and is still in its original location. The range is authorized for the firing of .30 Caliber weapons. This range has firing lines at 200, 300, 500, and 600 yards. The Pistol Range was constructed at the Rifle Range Complex at the same time the Rifle Range was constructed. The range has firing lines at 15 and 25 yards. A Multi-Purpose Machine Gun Range extends over the northern portion of the MARSOC complex. This range was created in 1957 and is located in the general area of the

former Transition Range. In May 1960 .30 Caliber rifles were authorized for use on this range. In February 1970 small arms (no armor piercing ammunition), white phosphorus hand grenades, and rifle grenades (practice) were authorized. In December 1986 the use of rifles, pistols, M60 machine guns, Squad Automatic Weapon, and shotgun, but no armor piercing ammunition, were authorized. In June 1994 .38 Caliber, .45 Caliber, 5.56mm, 7.62mm, 9mm, and .50 Caliber short range training ammunition were authorized for use on this range.

3.10.2 Environmental Consequences

3.10.2.1 No Action Alternative

Under the No Action Alternative, construction at the MARSOC complex would not occur. The existing conditions in hazardous materials and waste management and at contaminated sites would not change under the No Action Alternative. MCIEAST-MCB CAMLEJ would continue with currently scheduled remedial actions and environmental pollution abatement.

3.10.2.2 Proposed Action

The Proposed Action would result in an increase in personnel at MARSOC that in turn would result in an increase in use of training assets at MCIEAST-MCB CAMLEJ. IR Site 69, the active MMRP site, and the historic GPs 41A and 41B would be avoided by the proposed layout of complex facilities (Figure 3-6). IR sites were previously shown on Figure 3-5. IR Site 68 is located within the project area. Project P1433 is located within the southern edge of the rectangular area shown as the rifle range that is proposed for administrative closure.

TLZ Owl relocation Alternative 3 is located within IR Site 68. Soil and Aquifer Use Controls are in place on the site, and notification would be required to the state of North Carolina and the Environmental Protection Agency prior to any land disturbing activities, per requirements of the Land Use Controls Assurance Plan for the site. Contaminants on the site are deep below the soil surface and other construction has occurred within the boundaries; however land use and aquifer use controls would be enforced due to the elevated level of inorganics, presence of buried waste, and potential for previously unidentified contaminants. Also included within the proposed action is a multi-story Bachelor Enlisted Quarters (P1433) which is currently proposed to be placed in a location that is thought to have been previously considered for construction of a rifle range. The site would be assessed for suitability prior to any construction, and would undergo a formal administrative range closure process. The Proposed Action avoids IR Site 69, the UXO-02 and UXO-14 sites. A fence would continue to restrict access to IR Site 69.

During construction at the MARSOC complex, the management of hazardous materials would be conducted in accordance with all applicable laws and regulations. All personnel would be required to follow the procedures established by MCIEAST-MCB CAMLEJ for handling hazardous materials and petroleum, oil, and lubricants. By following these procedures, a release of contaminants would be avoided. No adverse impacts are anticipated for the Proposed Action from hazardous materials, waste, or restoration sites with the proper management of materials in accordance with all applicable laws and regulations.

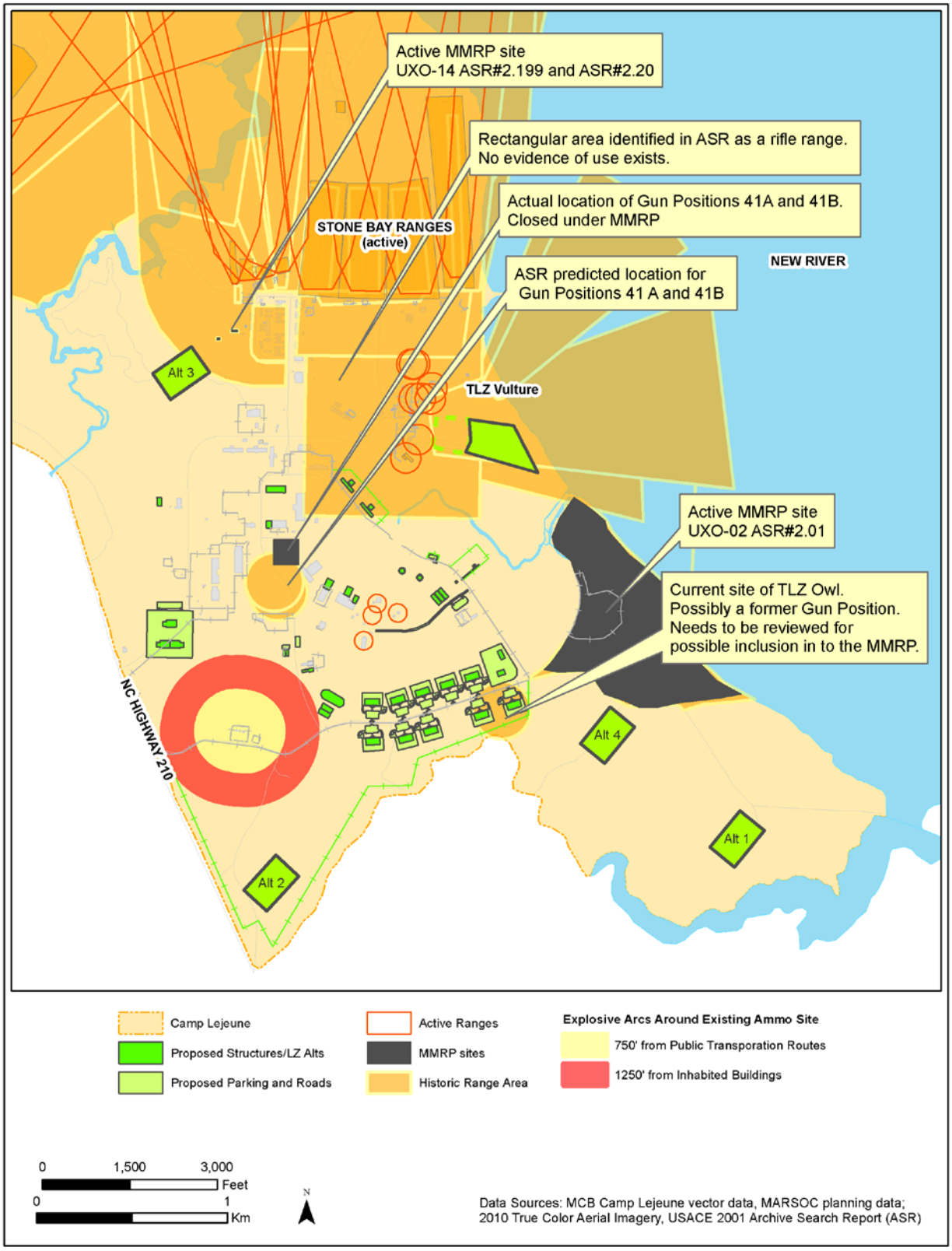


Figure 3-6 Active and Historic Ranges

4 CUMULATIVE EFFECTS

The Council on Environmental Quality (CEQ) regulations stipulate that the cumulative effects analysis within an EA should consider the potential environmental impacts resulting from "the incremental impacts of the action when added to past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions" (40 CFR 1508.7). Recent CEQ guidance in considering cumulative effects involves defining the scope of the other actions and their interrelationship with the Proposed Action. The scope must consider geographical and temporal overlaps among the Proposed Action and other actions. It must also evaluate the nature of interactions among these actions.

Cumulative effects are most likely to arise when a relationship or synergism exists between the Proposed Action and other actions expected to occur in a similar location or during a similar time period. Actions overlapping with or in proximity to the Proposed Action would be expected to have more potential for a relationship than those more geographically separated.

To identify cumulative effects, three fundamental questions need to be addressed:

- Does a relationship exist such that affected resource areas of the Proposed Action might interact with the affected resource areas of past, present, or reasonably foreseeable actions?
- If one or more of the affected resource areas of the Proposed Action and another action could be expected to interact, would the Proposed Action affect or be affected by impacts of the other action?
- If such a relationship exists, then does an assessment reveal any potentially significant impacts not identified when the Proposed Action is considered alone?

The scope of the cumulative effects analysis involves both the geographic extent of the effects and the time frame in which the effects could be expected to occur. For this SEA, there are several recent, present, and reasonably foreseeable projects at MCIEAST-MCB CAMLEJ that must be considered when analyzing cumulative impacts from the proposed construction activities at the MARSOC complex.

4.1 RECENT, ONGOING, AND REASONABLY FORESEEABLE ACTIONS

MARSOC:

As discussed previously this document is a supplement to a 2007 EA which addressed the initial stand-up of the MARSOC command at MCIEAST-MCB CAMLEJ, and construction of facilities to support that stand-up (Department of the Navy, 2007). Associated with the original proposed action was an influx of approximately 875 active duty personnel to Camp Lejeune. Construction has occurred to support this action and in the Stone Bay area approximately 220 ac (89 ha) of forest have been cleared to support construction, and 544 ac (220 ha) have converted from training area and RCW habitat to developed cantonment. Additionally, 12.5 ac (5 ha) of wetlands and 12,800 linear ft (3,901 m) of streams have been impacted for the construction completed to date.

A number of future projects are proposed to occur within the MARSOC complex area that do not warrant consideration here in this supplemental EA. These include proposed construction within already built upon areas and/or additions to existing structures. MCIEAST-MCB CAMLEJ reviewed each of these projects and determined which were to be included in the Proposed Action addressed by this supplemental EA and which were categorically excluded from further NEPA analyses in accordance with the procedures set forth in 32 CFR 775.6(f).

Categorical exclusions are generally applied to certain routine and administrative items, classroom training, building renovation/additions, modifications to existing systems or equipment, real estate actions, new construction and demolition that is similar to existing land uses, relocation of personnel that does not involve a substantial change affecting the supporting infrastructure, and routine military training. Specifically, 32 CFR 775.6(f) paragraphs 14 and 34 include the following activities that may be categorically excluded:

> *14)* Alteration of and additions to existing buildings, facilities, structures, vessels, aircraft, and equipment to conform or provide conforming use specifically required by new or existing applicable legislation or regulations (e.g., hush houses for aircraft engines, scrubbers for air emissions improvements to storm water and sanitary and industrial wastewater collection and treatment systems, and installation of firefighting equipment).
>
> *34)* New construction that is similar to existing land use and, when completed, the use or operation of which complies with existing regulatory requirements (e.g., a building within a cantonment area with associated discharges/runoff within existing handling capacities).

Table 4.1-1 includes projects from the MARSOC 2025 Stone Bay Facility Acquisition Strategy, not included in this EA, that have been categorically excluded under 32 CFR 775.6(f) paragraph 14 or 34.

Table 4.1-1 Recently Categorically Excluded Projects at MARSOC

Project	Description
P1285 SOF Armory Expansion	20,317 Sq Ft. Additional Paved Parking Area: 10,000 Sq Ft This project constructs a 16,194 Sq Ft Armory Facility with 4,123 Sq Ft of Covered Weapons Cleaning Area.
P-1419 SOF Battalion Aid Station Expansion	3,825 Sq Ft . Additional Paved Parking Area: 0 Sq Ft Constructs a 3,825 Sq Ft addition to the Battalion Aid Station (Building RR440), plus 300 Sq Ft of canopy.
MCIF Facility	4,000 Sq Ft Pre-Engineered Buildings (PEB) constructed near Supply Warehouse

CSS Admin Facility	4,000 Sq Ft Pre-Engineered Buildings (PEB) constructed near Supply Warehouse
G3-X Multi-Purpose Facility	4,000 Sq Ft Pre-Engineered Buildings (PEB) constructed near Supply Warehouse
SERE Instructor PEB	4,000 Sq Ft Pre-Engineered Buildings (PEB) constructed near RR516 Isolation Facility, with 10,000 Sq Ft of paved parking.
SATS PAD	Small Arms Training Simulator will set on a 4,320 Sq Ft concrete pad near the Indoor Small Arms Range
Ammo Operations PEB	2,000 Sq Ft Pre-Engineered Buildings (PEB) constructed near the Triple Arch Ammo Mag (bldg RR600-RR602) with 4,000 Sq Ft of paved parking
Reviewing Stand	2,184 Sq Ft covered reviewing stand.
MSOS Instructor Storage	4,000 Sq Ft Pre-Engineered Building (PEB) constructed near P-1287 Academic Expansion (RR450).
Running/Biking Trail	5 miles of 8 ft wide Asphalt/Rubber trails
PERRES Activity Bldg	4,500 Sq Ft stand-alone applied team instruction adjacent to RR136 (Fitness Center).
Vehicle Loading Ramp	Stone Bay Loading Ramp
Dumpster Enclosures	3 dumpster enclosures will be located near building RR141 (BEQ), BEQ parking lot, and behind building

Additionally, MCIEAST-MCB CAMLEJ and MARSOC determined that one proposed project is not yet ripe for discussion. This project is the FY 2016 SOF Boat Operations Facility, which proposed to construct a new boat ramp, pier/dock and parking area on the MARSOC shoreline of the New River. After discussions with the regulatory community and review of water depth data it became clear that it may not be economically possible or environmentally desirable to provide the needed facility at the proposed location. Therefore MARSOC planners are reviewing this project to better define the requirements and develop suitable alternatives accordingly.

Terrestrial impacts from this project are not likely to be substantial, the original proposal was not large. Aquatic impacts from the launching and docking facilities are to be determined.

Other Base-wide actions with the potential for cumulative impacts are listed below, and are followed by a brief description of each proposed action.

Temporary Beddown of Proposed Increase in End Strength. An EA was prepared for the proposed accommodation of immediate Grow the Force increases in Marines at MCIEAST-MCB CAMLEJ and MCAS New River, as mandated by the President's State of the Union address in January of 2007. These Marines would be accommodated in a combination of existing facilities and newly erected, relocatable facilities until permanent facility decisions were made in association with the Grow the Force EIS (see below). Four project areas were analyzed, with a total of 52 ac (21 ha) of land that would be disturbed. The EA resulted in a FONSI determination (Department of the Navy, 2008).

Range Operations at MCIEAST-MCB CAMLEJ and MCAS New River. This EA analyzed the potential consequences from current and projected training operations conducted at MCIEAST-MCB CAMLEJ and MCAS New River. The EA also addressed expected increases in training associated with Grow the Force personnel increases. Analyses in the EA resulted in a FONSI determination (MCIEAST-MCB CAMLEJ 2009b).

USMC Grow the Force at MCIEAST-MCB CAMLEJ, MCAS New River, and MCAS Cherry Point, North Carolina. An EIS was prepared for the proposed infrastructure development to support the permanent increase in Marines at MCIEAST-MCB CAMLEJ/MCAS New River and MCAS Cherry Point, as per the Presidential mandate to increase overall USMC end strength (Department of the Navy, 2009b). The EIS analyzes several action alternatives dealing with proposed new infrastructure construction, demolition and/or upgrades to existing infrastructure, and relocation and realignment of existing units and personnel to consolidate and better support the missions of the three Installations.

Runway Extensions at MCAS New River. An EA was prepared to address proposed extensions of Runways 05/23 and 01/19 at MCAS New River. Anticipated impacts for the proposed action included: long-term impacts on land use, vegetation, stormwater runoff, hunting opportunities and wetlands. Neither of the action alternatives considered would impact threatened or endangered species, groundwater, or cultural resources.

Suspect Cargo Area at Camp Geiger, MCIEAST-MCB CAMLEJ, North Carolina. An EA was prepared to construct a Suspect Cargo Area for MCAS New River, west of Camp Geiger. The EA considered several alternative locations which were eliminated due to close proximity to populated areas and public traffic routes. Anticipated impacts for the proposed action included the loss of 5 ac (2 ha) of forested land, and minor impacts to existing topography and soils, including clearing and filling approximately 5ac (2 ha) of palustrine wetlands.

Combined Arms Amphibious Assault Course and G-10 Impact Area Clearing. A planning study is currently underway to address identified improvements needed for training in and around the G-10 impact area at MCIEAST-MCB CAMLEJ. Known improvements desired include additional vegetation clearing for target visibility; current proposals would clear extensive

acreage of woody vegetation within and around the impact area to ensure clear lines of sight from surrounding firing locations and observation points into the impact area, and to provide greater flexibility for target location. The major focus of the planning study however is to specifically define the CAAAC proposal; which is intended to provide areas where armored tactical vehicles could maneuver across the landscape (rather than being restricted to trails and roads) to perform combined arms live fire amphibious operations from the sea towards multiple inland range objectives. Early concepts of the CAAAC have been developed and it is expected that there will be substantial impacts to forested areas and RCW habitat if the proposal is implemented.

Terrestrial Resources

In June 2009 an EIS was completed for the USMC Grow the Force personnel increase (Department of the Navy, 2009b). Table 4.4-2 of this EA quantifies impacts from past projects with regard to forest, wetland, and RCW habitat impacts. This table in the EA is hereby incorporated by reference and copies may be obtained by contacting the MCIEAST-MCB CAMLEJ Environmental Management Division.

RCW. MCIEAST-MCB CAMLEJ has undergone an intense period of construction as described in the 202K EIS and also within various range related NEPA documents, mentioned previously. The Base is required to address impacts to protected species from these and future projects as they occur under the Endangered Species Act, and to continue to manage towards meeting recovery of the species on remaining forested areas. MCIEAST-MCB CAMLEJ must have 173 active clusters of RCW before the species will be considered to be recovered. There is no specific date by which the Base must meet this goal, but it is recognized that a 10% growth in the number of clusters has been agreed to in previous consultations. Many smaller actions have taken acreage from current and future partitions; and although the incremental cumulative loss of habitat could result in an adverse environmental impact, these actions would not preclude MCIEAST-MCB CAMLEJ from meeting their recovery goal on MCIEAST-MCB CAMLEJ property. Conclusions regarding impacts to RCW from larger projects with more substantial impacts are summarized below:

- Proposed actions covered in the March 2009 "Engineer Training Complex and G-10 Range Realignment" EA (Department of the Navy, March 2009): The proposed action was predicted to result in the loss of four clusters. Construction is underway or complete on a portion of these ranges and two of the four clusters have been impacted to date. MCIEAST-MCB CAMLEJ successfully mitigated this impact in these two clusters by drilling nest cavities in unaffected habitat, and these areas are now occupied by the birds from the impacted clusters. It is particularly good that the original, experienced breeding pairs occupied the new cavities rather than less experienced birds. The remaining 2 clusters have not been impacted yet. These clusters would be impacted by project P1078 when the project moves forward.

  Proposed actions to be addressed in the Supplement to the 2009 Engineer Training Complex and G-10 Range Realignment EA (currently underway): Design changes to two of the ranges included in the 2009 EA would result in the taking of one additional cluster beyond what was predicted in the original EA and consultations.

The consultation and analysis is underway however it appears that the additional cluster can be replaced by relocating it to a new location within the existing partition boundaries. This would be accomplished by drilling new cavity trees outside the area of impact of the proposed range. MCIEAST-MCB CAMLEJ expects that the resident birds from the impact cluster would relocate to the newly drilled cavity trees and remain within their current partition. The impact to the population has been modeled and it was determined that even if the relocation is not successful (i.e., in the event that the newly created cavity trees are not occupied and the birds from the taken cluster abandon the area) that the loss of this one cluster would not preclude MCIEAST-MCB CAMLEJ from achieving its RCW recovery goal, (i.e., there is enough suitable habitat remaining on MCIEAST-MCB CAMLEJ for this and other impacts to still achieve the required number of clusters to meet the RCW recover goal including this lost cluster.

- Proposed actions to be addressed in subsequent NEPA documentation (Planning Study underway): MCIEAST-MCB CAMLEJ is considering clearing vegetation from the G10 Impact Area out to the primary (referred to below as the partial cut alternative) or secondary impact area boundary (referred to below as the larger cut alternative). MCIEAST-MCB CAMLEJ is also considering development of a large new range complex, known as the Combined Arms Amphibious Assault Course (CAAAC).

  The cumulative impacts from the proposed partial cut alternative plus the impacts from the range realignment addressed in the 2009 EA and current supplement would not be anticipated to be a significant adverse effect because MCIEAST-MCB CAMLEJ could successfully replace these lost clusters in existing suitable habitat, on-base, in a reasonably short time period. This expectation is based on the current availability of suitable habitat remaining on MCIEAST-MCB CAMLEJ.

  However the cumulative impact of the proposed larger cut alternative plus the impacts from the range realignment addressed in the 2009 EA and current supplement would potentially be significant because a larger number of clusters would be impacted, these clusters form the core of the MCIEAST-MCB CAMLEJ population in the highest quality habitat and thus would leave the remaining clusters fragmented and less successful, and although there are enough acres on MCIEAST-MCB CAMLEJ to eventually recoup the lost clusters there would not be enough suitable habitat ready to occupy to recoup the lost clusters in the short-term.

  The CAAAC would bring additional impacts to RCWs if it were to be constructed according to preliminary concepts. The planning study is currently underway to determine the specific requirements of the CAAAC and to recommend courses of action for further analysis and deliberation. Impacts to resources, including RCW, are not yet determinable because the CAAAC proposal is yet to be adequately defined and reasonable alternatives have not yet been identified and considered. MCIEAST-MCB CAMLEJ is actively investigating opportunities to mitigate future impacts to RCW clusters off of the Base, through partnerships with the NC Wildlife Resources

Commission and through land acquisition and conservation easements. Modeling of suitable habitats show that it would eventually be possible to recoup a sufficient number of clusters to mitigate the impacts of the CAAAC and other proposals, but the timeline for their replacement could be 60 years or more sue to the existing age of trees in the areas being considered.

FORESTED AREAS. Duke University is conducting an ongoing scientific study ("Change Analysis") to quantitatively and graphically document the change in land cover at MCIEAST-MCB CAMLEJ since the 1980s (see Figures 4-1 and 4-2). For the dates 1984 through 2007 the land cover data analysis showed that 1,746 patches of at least 1.1 ac (0.4 ha) in size had significant green vegetation reduction between 1984 and 2007. This represents an area of 35,580 ac (14,399 ha), or about 25 percent of the area of MCIEAST-MCB CAMLEJ. The study then determined if the loss of green vegetation was due to forest being converted to developed areas, or whether it was vegetated areas becoming less vegetated (but still remaining vegetated areas). Using their analysis, the authors of the study determined that 7,720 ac (3,124 ha) of MCIEAST-MCB CAMLEJ has been converted from a vegetation cover type to human impacted, developed land. This is 5.4 percent of all of MCIEAST-MCB CAMLEJ.

The definition of 'developed land' is subjective, but for this study, developed land includes human impacted uses (i.e., residential, commercial, industrial) as well as barren land. Developed does not necessarily mean that structures are present but simply that it has been disturbed by human impact in some way. Further analysis was conducted on the Duke University study data to classify the location of the change areas in order to see if the change area occurs in the cantonment area or in the training areas at MCIEAST-MCB CAMLEJ. Areas of development occurring in the cantonment area would imply construction of buildings and infrastructure for residential, commercial or industrial uses, while areas of change occurring in the training areas would imply area that has been cleared for, or because of training activities. The data shows that 1,343 ac (543 ha) (0.93 percent of the total area of the Installation) of the change to developed area has occurred in the cantonment area and 6,377 ac (2,581 ha) (4.46 percent of the total area of the Installation) of the change to developed area has occurred in the training areas of MCIEAST-MCB CAMLEJ. In all, 8.2 percent of the cantonment areas and 5.8 percent of the training areas was converted from vegetated to developed lands between 1987 and 2001.

Water Resources

Approximately 0.42 ac (0.17 ha) of palustrine wetlands, 0.13 ac (0.05 ha) of which would be spanned not filled, and 225 linear ft (69 m) of stream would be impacted by the Proposed Action. Projects previously permitted by the Wilmington District, Army Corps of Engineers for construction at MCIEAST-MCB CAMLEJ total approximately 543 ac (220 ha) of impacted wetlands to date that were mitigated through the Greater Sandy Run Area Wetland Mitigation Bank. This quantity of wetlands does not reflect impacts that were not mitigated for through the bank, but were paid for through a fee to NCDENR. As of November 30, 2011, 894.932 mitigation credits have been used out of the 1250.500 credits established in the bank as of June 26, 2007. There are 355.568 mitigation credits available for use in the bank.

There are no cumulative adverse impacts to surface water or groundwater anticipated from the Proposed Action.

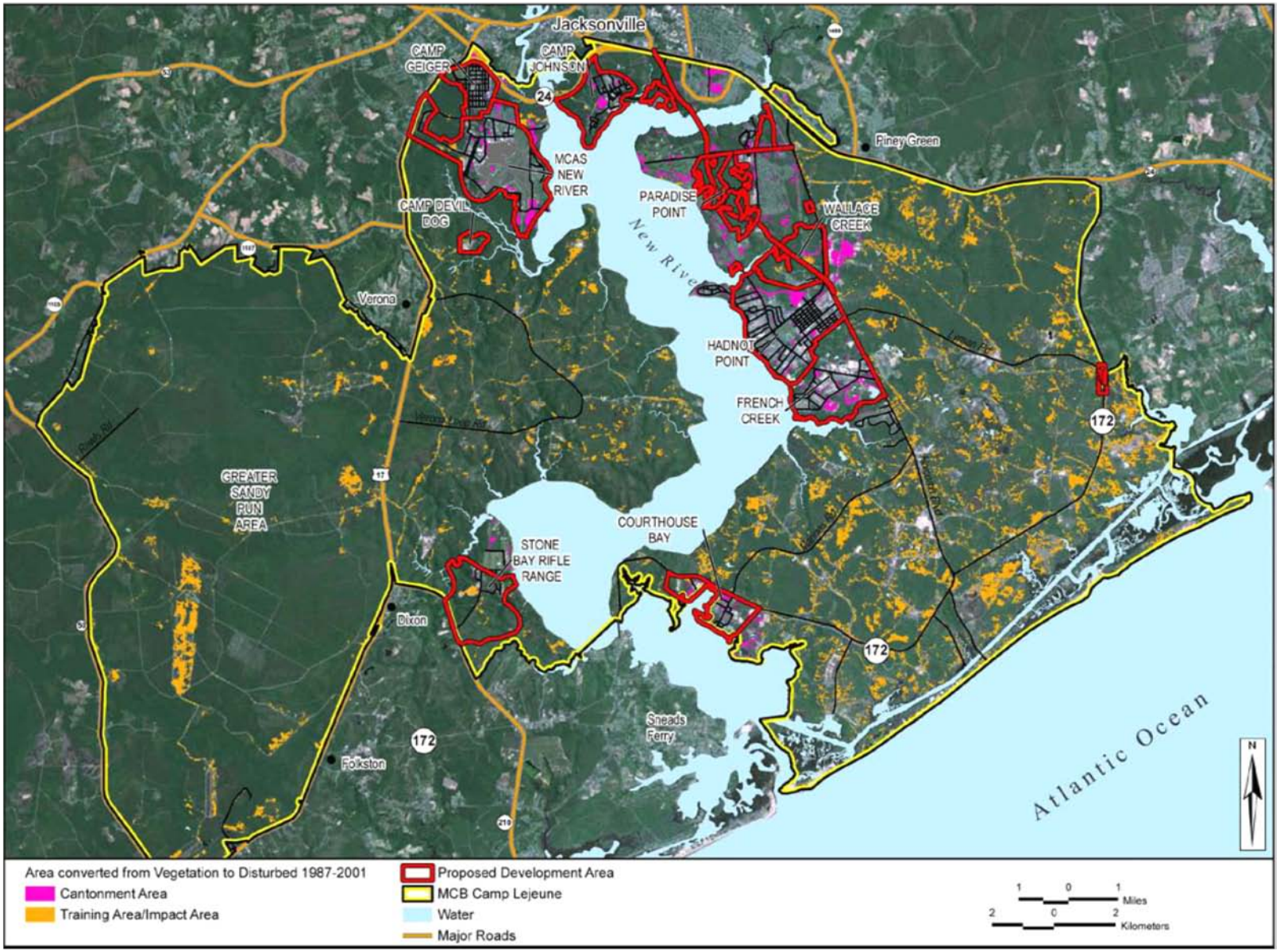
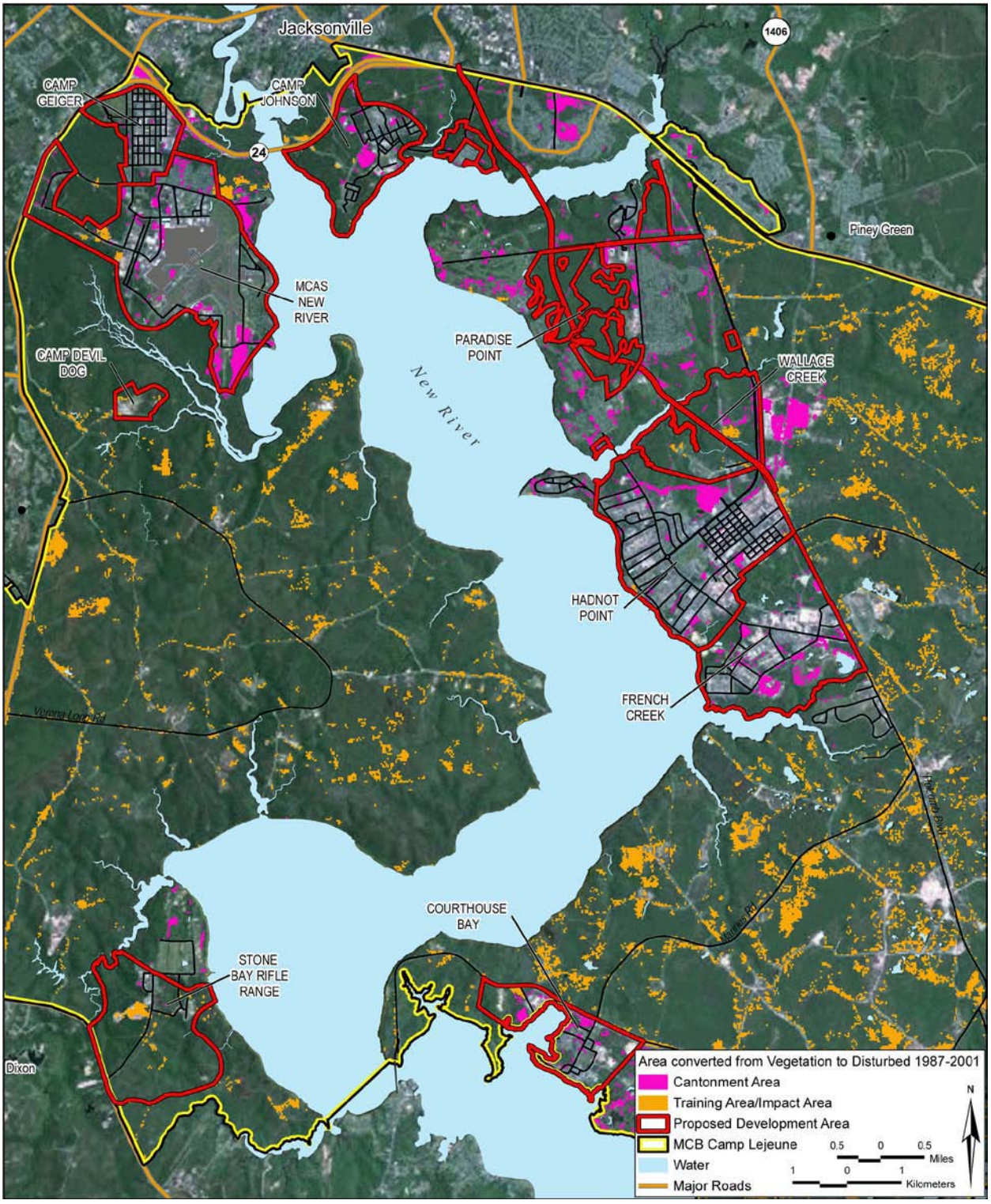


Figure 4-1 Change in Forest Cover at MCIEAST-MCB CAMLEJ MCAS New River - Basewide



1 ***Figure 4-2 Change in Forest Cover – Proposed Development Areas***

4.2 UNAVOIDABLE ADVERSE IMPACTS

The primary unavoidable, adverse impacts on the environment resulting from the implementation of the Proposed Action would be the long-term effects of the removal of up to 139 ac (56 ha) of mixed pine-bottomland hardwood habitats, including up to 65 ac (26 ha) of future RCW habitat. This would reduce the carrying capacity for wildlife species associated with that type of habitat but would not be significant in the context of all similar forested areas within Camp Lejeune. In addition, noise generating activities would occur during the construction phases of the project and also from military training that would be conducted at proposed training facilities within the complex. The Proposed Action would result in minor increases in air emissions from construction, operation, and maintenance of the new facilities. In addition, up to 0.42 ac (0.17 ha) of wetlands, 0.13 ac (0.05 ha) of which would be spanned not filled, and 225 linear ft (69 m) of stream would be impacted. One project is located within the southern edge of the area depicted in the range archive as a rifle range (although there is no evidence of firing ever occurring in this area) and TLZ Owl relocation Alternative 3 is located within IR Site 68. However, assessment/site investigation and any necessary mitigation and remediation would be completed prior to construction.

There would be minor short-term impacts, such as increases in dust, noise levels, and traffic at the project areas associated with construction activities. Grading and clearing would make the site more vulnerable to erosion, and make nearby waters more vulnerable to siltation effects. The latter impacts would be minimized through use of erosion and sediment controls and stormwater BMPs.

4.3 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USE OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY

NEPA requires an analysis of the relationship between a project's short-term impacts on the environment and of the effects that these impacts may have on the maintenance and enhancement of the long-term productivity of the affected environment. Impacts that narrow the range of beneficial uses of the environment are of particular concern. This refers to the possibility that choosing one development option reduces future flexibility in pursuing other options, or that giving over a parcel of land or other resource to a certain use eliminates the possibility of other uses being performed at the site.

Short-term uses of the environment are those that occur over a period of less than the life of the Proposed Action. Long-term uses include those impacts that would persist for a period of five years or more, or for the life of the Proposed Action. The activities addressed in this EA that would be categorized as short-term include the land clearing and construction of facilities at the complex project area.

From a long-term perspective, the Proposed Action would improve the military's capability to provide a mission ready force. The MARSOC complex area could be used for forested training maneuvers and provide a future use for special operations training as well as provide the space that would be needed for the administrative support of that training through the proposed facilities construction. The negative impacts of achieving this capability would be the removal of up to 139 ac (56 ha) of mixed pine-bottomland hardwood habitat and the associated wildlife

species, including one future RCW partition. The loss of forested habitat also results in a long-term, though minimal, reduction in commodity production and revenues.

The Proposed Action would take place within an area of MCIEAST-MCB CAMLEJ that is already largely developed by the existing MARSOC complex. While some forested area dedicated as future RCW habitat would be lost, the ecosystem at large would not be lost. Implementation of the Proposed Action or No Action Alternative would not result in any impacts that would reduce environmental productivity, permanently narrow the range of beneficial uses of the environment, or pose long-term risks to health, safety, or the general welfare of the public.

4.4 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF NATURAL AND DEPLETABLE RESOURCES

NEPA requires that environmental analysis include identification of "…any irreversible and irretrievable commitments of resources which would be involved in the Proposed Action should it be implemented." Irreversible and irretrievable resource commitments are related to the use of non-renewable resources and the effects that the uses of these resources have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (e.g., energy or minerals) that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., the disturbance of a cultural site).

Fuel, construction materials, and labor would be expended during construction of facilities. Operating the new facilities would require energy to heat, cool, and light the buildings. Therefore, minor amounts of these nonrenewable resources would be irretrievably lost or depleted. Moreover, the Proposed Action would not result in the destruction of environmental resources such that the range of potential uses of the environment would be limited, nor impact the biodiversity of the region. Although some wetlands would be lost, much of the impact would be offset or minimized through design, minimization measures, and mitigation..

4.5 MITIGATION MEASURES

The following mitigation measures would be implemented as part of the Proposed Action:

MCIEAST-MCB CAMLEJ has included a requirement into the planning process for projects, P1218 and P1393 (which are the first of the projects to go into design that are proposed for construction in future RCW habitat), to preserve as much as the existing natural environment as possible. The design contractor is tasked with providing a site plan that incorporates natural wooded areas into the layout as much as possible, rather than presuming that the entire limits of disturbance are to be cleared, filled and graded.

MARSOC would consider providing funding to MCIEAST-MCB CAMLEJ RCW recovery efforts, including off-base partnerships that are currently in development under coordination with the US Fish and Wildlife Service. Funding would be sufficient to offset current and future predicted impacts to habitat from MARSOC related projects.

Air emissions from heating and cooling systems would be minimized by using a nondistributed boiler network that would use liquid petroleum gas. In addition, construction effects would be controlled using standard management practices such as routine sweeping and wetting to reduce air emissions.

If during construction and site grading any site of potential historical or archaeological significance is encountered, the installation commander would be notified. The unit commander would order actions in the vicinity halted and the area marked. The unit commander would immediately notify the MCIEAST-MCB CAMLEJ archaeologist at telephone (910) 451-7230.

BMPs would be used to avoid and minimize the release of sediments into stormwater, with mitigation plans including both short-term (construction phase) and long-term (project life) features to meet the requirements of MCIEAST-MCB CAMLEJ's Stormwater Pollution Prevention Plan. Other mitigation measures would include planting grass on bare areas and landscaping in select areas Site design would consider regulatory requirements relating to stormwater and include discussions with DENR for type and placement of required BMPs and low-impact development features. Mitigation measures for loss of vegetation would include planting grass along roadsides and around buildings, with the addition of shrubs, trees and mulching in select areas.

All projects would be designed to avoid and minimize impacts to wetlands and waters of the US. MARSOC would abide by the MCIEAST-MCB CAMLEJ policy that all new construction will maintain a 50 ft setback from wetlands, wherever possible. In addition, wetland and stream mitigation would be conducted to fulfill all permit condition requirements.

5 LIST OF PREPARERS

US Navy

Name	Title	Affiliation
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U.S. Marine Corps

Name	Title	Affiliation
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6 REFERENCES

CATLIN Engineers and Scientist. 2010. P-1286B-Connector Road. 35% Submittal. Marine Corps Base Camp Lejeune, North Carolina. December

CATLIN Engineers and Scientist. 2011. Appendix B P-1286B BOD Final Document. May

Department of the Navy. 2003. NPDES Phase II Stormwater Management Plan for MCB Camp Lejeune and MCAS New River, North Carolina.

Department of the Navy. 2007. Final Environmental Assessment for Marine Special Operations Command Complex on MCIEAST-MCB CAMLEJ, North Carolina. Prepared by TEC Inc. August.

Department of the Navy. 2009. Engineer Training Complex and G-10 Range Realignment, MCIEAST-MCB CAMLEJ. March.

Department of the Navy. 2009b. Final Environmental Impact Statement for U.S. Marine Corps Grow the Force at MCIEAST-MCB CAMLEJ, MCAS New River, and MCAS Cherry Point.
Prepared by TEC Inc. December.

Department of the Navy. 2010a. Final Environmental Assessment for Proposed Child Development Center at Courthouse Bay, MCIEAST-MCB CAMLEJ, North Carolina. Prepared by TEC Inc. September.

Department of the Navy. 2010b. Final Environmental Assessment for Suspect Cargo Area at Camp Geiger, MCIEAST-MCB CAMLEJ, North Carolina. Prepared by TEC Inc. August.

Department of Navy. 2012a. Marine Corps Base Camp Lejeune Preliminary Subsurface Exploration and Geotechnical Engineering Analysis. SOF MSOB Company and Team Facilities Site Evaluation of Primary Development Area. Marine Corps Forces Special Operations Command (MARSOC) Stone Bay Area. 90% Submittal January 16, 2012.

Department of Navy. 2012b. SOF IT Barracks Concept Plan and Evaluation. Marine Corps Forces Special Operations Command (MARSOC) Stone Bay Area, MCIEAST-MCB CAMLEJ. January 5, 2012.

Klotz, Martin. 2007. Senior Instructor, Special Operations Training Group, Marine Corps Base Camp Lejeune, North Carolina. Personal communication by telephone.

MCIEAST-MCB CAMLEJ. 2007. Integrated Natural Resource Management Plan (2007-2011) Marine Corps Base Camp Lejeune, Onslow County, North Carolina. January

MCIEAST-MCB CAMLEJ. 2006. *Consultation Package for the Marine Corps Special Operations Command (MARSOC) Development in the Vicinity of the Stone Bay Rifle Range Historic District, Marine Corps Base, Camp Lejeune, North Carolina*. August.

MCIEAST-MCB CAMLEJ. 2005. *Environmental Assessment for Force Structure Review Group Fiscal Year 2005 Initiatives. Marine Corps Base, Camp Lejeune, North Carolina*. August

MCIEAST-MCB CAMLEJ. 2003. *Fueling Station Consolidation Traffic Study for Marine Corps Base Camp Lejeune.* Prepared by Ramey Kemp and Associates, Inc. June

MCIEAST-MCB CAMLEJ. 1999. *Long-term Watershed Management Plan for Cogdel's Creek: Marine Corps Base, Camp Lejeune, North Carolina.* April

Naval Facilities Engineering Command, Mid-Atlantic Division (NAVFAC MIDLANT). 2007. *Water Distribution Study, Domestic Water and Fire Protection, Rifle Range and MARSOC Areas, MCIEAST-MCB CAMLEJ, North Carolina.* Prepared by C. Allan Bamforth, Jr., Engineer-Surveyor, Ltd. and Hughes Associates, Inc. January

NAVFAC MIDLANT. 2006. Master Plan Charrette Marine Corps Special Operations Command, Marine Corps Base Camp Lejeune, Jacksonville, North Carolina. Prepared by HBA in Association with: Bowman, Foster & Associates, P.C.; Vanasse Hangen Brustin, Inc.; and Hughes Associates, Inc. May

NCDENR, DWQ. 2001. NCDENR Division of Water Quality.

NCDENR, DWQ. 2006. NCDENR Division of Water Quality.

NCDENR. 2012. NCDENR, Division of Water Resources. Internet site: http://www.ncwater.org/Education_and_TechnicalAssistance/Ground_Water/AquiferCharacteristics/.

NCDMF. 2006. North Carolina Division of Marine Fisheries.

Onslow County Planning and Development. 2003. *Citizen's Comprehensive Plan for Onslow County.* Prepared by Citizen's Comprehensive Plan Committee.

Richardson, Duane. 2012a. Range Control Division at Marine Corps Base Camp Lejeune, North Carolina. Personal Communication by Telephone. January

Richardson, Rick. 2012b. EMD archaeologist at Marine Corps Base Camp Lejeune, North Carolina. Personal Communication by Telephone. February

Rylander et. Al. 1988. Maximum Noise Levels as Indicators of Biological Effects. Journal of Sound and Vibration, Vol. 127.

Rylander et. Al. 1974. Re-analysis of Aircraft Noise Annoyance Data Against the dBA Peak Concept. Journal of Sound and Vibration, Vol. 36.

USACE. 2001. U.S. Army Corps of Engineers.

US Army Center for Health Promotion and Preventative Medicine (USACHPPM). 2007. Addendum to Operational Noise Consultation 52-ON-03WZb-07, Operational Noise Contours Under the 202 Range Transformation Plan, U.S. Marine Corps Base, Camp Lejeune, North Carolina, May 2007. June

USACHPPM. 2005. Operational Noise Consultation 52-ON-03F9-05, Large Caliber Weapon Noise Contours for Marine Corps Base Camp Lejeune, North Carolina. June.

US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS). June 5, 2009. Soil Survey Division, Soil Series Name Search website search February 7, 2012. http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

United States Marine Corps (USMC). 2011. 2010 Force Structure Review. November 8.

U.S. Army Corps of Engineers (USACE). 2001. *Range Identification and Preliminary Range Assessment Marine Corps Base Camp Lejeune.* December.

USACE and USEPA. 1990. *Memorandum of Agreement Between the Department of the Army and the Environmental Protection Agency, The Determination of Mitigation under the Clean Water Act Section 404 (b)(1) Guidelines*. February.

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APPENDIX A – AGENCY COORDINATION

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APPENDIX B – COASTAL CONSISTENCY DETERMINATION

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FEDERAL COASTAL CONSISTENCY DETERMINATION FOR ADDITIONAL CONSTRUCTION ON THE MARINE SPECIAL OPERATIONS COMMAND COMPLEX (MARSOC), MARINE CORPS BASE CAMP LEJEUNE, NORTH CAROLINA

May 2012

The United States Marine Corps (USMC) has determined that the proposed activity is consistent with the enforceable policies of North Carolina's approved Coastal Management Program.

1.0 FEDERAL AGENCY PURPOSE AND ACTION

The USMC proposes construction of additional facilities and infrastructure at the existing Marine Special Operations Command Complex (MARSOC), which is located in the Stone Bay area of Marine Corps Base (MCB) Camp Lejeune, North Carolina, on the west side of the New River. The complex encompasses approximately 2,017 acres (ac) (816 hectares [ha]) (Figure 1).

The overall mission of MARSOC is to train, organize, equip, and when directed by the Commander of United States Special Operations Command (USSOCOM), deploy task oriented, scaleable, and responsive USMC Special Operations Forces (SOF) worldwide in support of combatant commanders and other agencies. In order to execute this mission, MARSOC concentrates on several core activities: 1) Foreign International Defense; 2) Unconventional Warfare; 3) Special Reconnaissance; 4) Direct Action; 5) Counterterrorism; and 6) Information Operations.

Two MARSOC battalions are currently located at other parts of the Base. These battalions would be relocated to MARSOC, so that all facilities can be consolidated into one complex. Further, in accordance with a USSOCOM Manpower Study, approximately 750 additional personnel would be phased into MARSOC between FY 2013 to FY 2015. New buildings, training facilities, infrastructure, and utilities are needed to support the reorganization and future growth of MARSOC.

Under this action new facilities and infrastructure would be constructed at the existing MARSOC complex, as listed in Table 1 and shown in Figure 2. Final designs have not yet been completed and are currently in the conceptual stage. Facilities would be constructed beginning in FY 2012 and continue through FY 2017. Site improvements would include grading, pavements, security lighting, utility connections, and stormwater management. The majority of the projects would be constructed on grassy lots that would result in minimal disturbance; however, there would be some areas that would require forest clearing. The Proposed Action also includes relocation of an existing TLZ within the MARSOC complex, referred to as TLZ Owl. TLZ Owl is approximately 6 to 8 ac (2.4 to 3.2 ha) and would be relocated to one of four alternative locations in and around the current MARSOC complex or would be replaced through expansion of TLZ Vulture which lies directly south of the Stone Bay Rifle Range. Operations associated with TLZ Owl would not change under the Proposed Action. Total acreage disturbed from the proposed projects would be approximately 162 ac (66 ha), plus additional disturbance for stormwater management. The project area would be surveyed on a timely basis and all debris from construction would be removed to minimize the accumulation of potentially hazardous materials.

The USMC will comply with 401 Water Quality Certification, a state-approved erosion and sediment control plan, and stormwater management permit requirements.

Table 1 Project Descriptions

Project Number/ FY	Facility Type	Description	Size	Additional Paved Parking Area or Paved Area
	TLZ Owl	Relocation of the existing TLZ Owl to one of four alternative sites within the MARSOC complex, or expansion of TLZ Vulture.	23 acres	0
P1440 FY 2012	Survival, Evasions, Resistance, and Escape (SERE) Pre-engineered buildings	This project would install three pre-engineered buildings for use as training labs, instructor and administrative space. The buildings are referred to as the "Advanced Activities Building, Full-Mission Profile Building, and the Special Projects Building."	12,000 SF	0
P1218 FY 2013	SOF MSOB Company/Team Facilities	A team operations facility and Battalion Headquarters for 3d MSOB	236,795 SF plus paving of 800,000 SF of existing gravel roadway	600,000 SF
P1393 FY 2013	SOF SERE Training Facility	Instructional training and practical application facility to conduct SERE courses of instruction	11,205 SF	230,000 SF
P1395 FY 2014	SOF Marine Special Operations Regiment (MSOR) Headquarters	A separate regimental Headquarters facility to support administration, operational planning and mission preparation	30,000 SF	43,600 SF
FY 2014	CDC	Construct a 230 seat CDC to support the entire population at Stone Bay	22,370 SF	21,000 SF
P1391	SOF Sustainment Training Complex	Various training/range facilities to support MARSOC sustainment and	89,976 SF plus 230,000 SF of paved roadway and bridge	50,000 SF

Project Number/ FY	Facility Type	Description	Size	Additional Paved Parking Area or Paved Area
FY 2014		mission training requirements	area	
P1362 FY 2014	SOF Performance Resiliency Center	Provides space for administrative, physical therapy, physical performance education and training, nutrition education and adjacent field house to support Warfighter Rehabilitation Performance/ Human Performance Initiative activities for East Coast based MARSOC units	39, 288 SF	84,000 SF
P1433 FY 2014	Initial Training Course Bachelor Enlisted Quarters	Multi-story Bachelor Enlisted Quarters with capacity for 240 individuals	61,871 SF	10,000 SF
P1396 FY 2015	SOF Intelligence/Operations Expansion	An expansion of existing facility RR405 to support the operations of an Intelligence Battalion (vice Company)	39,568 SF	0 SF
P1219 FY 2016	SOF MSOB Company/Team Facilities	A team operations facility and Battalion Headquarters for 2d MSOB	236,795 SF plus 800,000 SF of paved road and bridge area	600,000 SF
P1392 FY 2016	SOF Military Working Dog Facility	SOF military working dog facility to include administrative space, 20 kennels	7,201 SF	13,500 SF
P1394 FY 2016	SOF Motor Transport Maintenance Expansion	Provides additional and consolidated maintenance/ operations facilities to support reorganization of MARSOC (Regimental Headquarters and two MSOBs at MCIEAST-MCB CAMLEJ) and addition of an Intelligence Battalion (vice Company)	63,000 SF	714,000 SF

Project Number/ FY	Facility Type	Description	Size	Additional Paved Parking Area or Paved Area
P1410 FY 2017	SOF EOD Expansion	Facility to support operational planning, administrative, training, and storage for EOD operations	5,920 SF	18,000 SF
P1284 FY 2017	SOF Training Tank Expansion	Expand existing building RR460 to increase the size of the training tank to accommodate mission training requirements.	34,122 SF	5,000 SF
P1411 FY 2017	SOF Paraloft Expansion	Expand existing building RR460 to increase the size of the Paraloft to support MARSOC sustainment and mission training requirements.	25,004 SF	22,000 SF
P1288 FY 2017	SOF Combat Service Support Facility	Headquarters, operations and maintenance support facility to provide administrative, operational, and maintenance support services for Combat Service Support organizations	32,292 SF	246,000 SF
Total Acreage of Construction: 162 ac (66 ha) (to account for approximately 10 percent buffer). **Of the 162 ac (66 ha), approximately 67 ac (27 ha) for parking/paved lots; 24 ac (10 ha) for buildings; 46 ac (19 ha) for paved roadways; and 25 ac (10 ha) for the TLZ Owl. These estimates do not include additional space for stormwater management.**				

2.0 NORTH CAROLINA COASTAL AREA MANAGEMENT ACT

In 1972, Congress passed the Coastal Zone Management Act, which encouraged states to keep the coasts healthy by establishing programs to manage, protect, and promote the country's fragile coastal resources. Two years later, the North Carolina General Assembly passed the landmark Coastal Area Management Act (CAMA). CAMA established the Coastal Resources Commission, required local land use planning in 20 coastal counties, and provided for a program for regulating development. The North Carolina Coastal Management Program was federally approved in 1978 by the National Oceanic and Atmospheric Administration.

2.1 AREAS OF ENVIRONMENTAL CONCERN

North Carolina's coastal zone includes the 20 counties that are adjacent to, adjoining, intersected by or bounded by the Atlantic Ocean or any coastal sound, including Onslow County. There are two tiers within this boundary. The first tier is comprised of Areas of Environmental Concern (AECs) designated by the state. AECs have more thorough regulatory controls and include coastal wetlands, coastal estuarine waters, public trust areas, coastal estuarine shorelines, ocean beaches, frontal dunes, ocean erosion areas, inlet lands, small surface water supply watersheds, public water supply well fields, and fragile natural resource areas. The second tier includes land uses with the potential to affect coastal waters, even though they are not defined as AECs. The coastal zone extends seaward to the three nautical mile territorial sea.

An AEC is an area of natural importance and its classification protects the area from uncontrolled development. AECs include almost all coastal waters and about three percent of the land in the 20 coastal counties. The four categories of AECs are:

- The Estuarine and Ocean System, which includes public trust areas, estuarine coastal waters, coastal shorelines, and coastal wetlands;
- The Ocean Hazard System, which includes components of barrier island systems;
- Public Water Supplies, which include certain small surface water supply watersheds and public water supply well fields; and
- Natural and Cultural Resource Areas, which include coastal complex natural areas; areas providing habitat for federal or state designated rare, threatened or endangered species; unique coastal geologic formations; or significant coastal archaeological or historic resources.

MCIEAST-MCB CAMLEJ contains coastal resources designated as AECs, including estuarine coastal waters, coastal shorelines, and coastal wetlands of the Estuarine and Ocean System AEC, as well as habitat for federal or state designated species and archaeological or historic resources of the Natural and Cultural Resource Area AEC. Furthermore, all land located within 75 feet (ft) (23 meters [m]) of the normal high water level of coastal waters and within 30 ft (9 m) of the normal high water level of inland water is also considered to be coastal shoreline within the Estuarine and Ocean System AEC. There are no estuarine wetlands within the proposed project area, but there are palustrine forested and palustrine scrub-shrub wetlands present. Habitat that supports threatened and endangered species are considered a coastal resource under the Natural and Cultural Resource Area AEC. The proposed construction area is not currently used as habitat for any threatened and endangered species, but is anticipated to be future habitat for red-cockaded woodpecker (RCW).

Other coastal resources not designated as AECs in the vicinity of the project area include special secondary nursery areas. Following is an analysis of the applicability of policies designed to protect AECs and the project's consistency with those policies, when applicable.

2.1.1 15A NCAC 07H.0200 (Estuarine and Ocean Systems)

15A NCAC 07H .0205 defines and establishes management objectives for coastal wetlands "to conserve and manage coastal wetlands so as to safeguard and perpetuate their biological, social,

and economic and aesthetic values; to coordinate and establish a management system capable of conserving and utilizing coastal wetlands as a natural resource essential to the functioning of the entire estuarine system." The proposed project area has no estuarine wetlands; however, about 0.31 ac (0.12 ha) of riparian palustrine forested wetlands (0.13 ac [0.05 ha] of which would be spanned, not filled), 0.11 ac (0.04 ha) of non-riparian palustrine scrub-shrub wetlands, would be impacted by the Proposed Action (see Figure 3).

15A NCAC 07H .0206 defines and establishes management objectives for estuarine waters in order "to conserve and manage the important features of estuarine waters so as to safeguard and perpetuate their biological, social, aesthetic, and economic values; to coordinate and establish a management system capable of conserving and utilizing estuarine waters so as to maximize their benefits to man and the estuarine and ocean system." The Proposed Action would not adversely affect coastal water quality. Stormwater management plans, including the use of best management practices during construction, would control surface water runoff into any adjacent waterways. Therefore, the Proposed Action is not expected to cause any significant runoff that might enter estuarine waters.

15A NCAC 07H .0207 defines and establishes management objectives for public trust areas, in order "to protect public rights for navigation, recreation, and to conserve and manage public trust areas in a manner that safeguards and perpetuates their biological, economic, and aesthetic values." Public rights for navigation and recreation of public trust waters would be protected as no loss of public trust waters would result from this proposed project. The proposed construction project would not cause a change in the public's current ability to access coastal resources in Onslow County.

The Proposed Action would be consistent with policies intended to protect estuarine and ocean systems.

2.1.2 15A NCAC 07H.0300 (Ocean Hazard Areas)

15A NCAC 07H .0303 defines and establishes management objectives for ocean hazard areas "to eliminate unreasonable danger to life and property and achieve a balance between the financial, safety, and social factors that are involved in hazard area development." The project area for the Proposed Action is not within an ocean hazard area. Therefore, policies on ocean hazard areas are not applicable.

2.1.3 15A NCAC 07H.0400 (Public Water Supplies)

15A NCAC 07H .0403 defines and establishes management objectives for public water supplies. The objective in regulating development within critical water supply areas is the "protection and preservation of public water supply well fields and A-II streams and to coordinate and establish a management system capable of maintaining public water supplies so as to perpetuate their values to the public health, safety, and welfare." There are no public water supply wells, well fields, or small surface water supply watersheds within the project area. Therefore, the Proposed Action would be consistent with policies designed to protect groundwater and public water supplies.

2.1.4 15A NCAC 07H.0500 (Natural and Cultural Resource Areas)

15A NCAC 07H .0501 defines fragile coastal natural and cultural resource areas as "areas containing environmental, natural, or cultural resources of more than local significance in which uncontrolled or incompatible development could result in major or irreversible damage to natural systems or cultural resources, scientific, educational, or associative values, or aesthetic qualities." The AECs within this category are coastal complex natural areas, coastal areas that sustain remnant species, unique coastal geologic formations, significant coastal architectural resources, and significant coastal historic architectural resources.

15A NCAC 07H .0505 defines and establishes management objectives "to protect unique habitat conditions that are necessary to the continued survival of threatened and endangered native plants and animals and to minimize land use impacts that might jeopardize these conditions." The proposed site does not currently provide unique habitat conditions that support threatened and endangered native plants and animals, but is anticipated to be future RCW habitat (see Figure 4). Though this action would remove 65 ac (26 ha) of future potential habitat, the project is not anticipated to adversely impact the continued survival of RCW.

15A NCAC 07H .0506 defines and establishes management objectives "to protect the features of a designated coastal complex natural area in order to safeguard its biological relationships, educational and scientific values, and aesthetic qualities." The proposed project area is in the vicinity of palustrine forested and palustrine scrub-shrub wetlands, but minimal disturbance would be accomplished through final project design and required mitigation. It is expected that a total of 0.42 ac (0.17 ha) of wetlands, 0.13 ac (0.05 ha) of which would be spanned not filled, and 225 linear ft (69 m) of stream would be impacted. As stated in Section 2.2.7, stormwater management plans, including the use of best management practices during construction, would control surface water runoff into adjacent wetlands and any surface water bodies. The appropriate permits would be acquired and mitigation measures implemented as described in Section 2.2.6.

15A NCAC 07H .0507 defines and establishes management objectives "to preserve unique resources of more than local significance that function as key physical components of natural systems, as important scientific and educational sites, or as valuable scenic resource." This policy is not applicable as no unique geological formations are designated within the proposed project area.

15A NCAC 07H .0508 defines and establishes use standards for development in designated fragile coastal natural or cultural areas. The proposed project area is not within a designated fragile coastal natural or cultural resource area. Implementing the Proposed Action would not cause irreversible damage to natural systems or cultural resources, scientific, educational, or associative values, or aesthetic qualities; therefore, this policy is not applicable.

15A NCAC 07H .0509 defines and establishes management objectives "to conserve coastal archaeological resources of more than local significance to history or prehistory that constitute important scientific sites, or are valuable educational, associative, or aesthetic resources." No significant coastal historic archaeological resources are located within the project area; therefore, this policy is not applicable and the NC State Historic Preservation Office need not be consulted.

15A NCAC 07H .0510 defines and establishes management objectives "to conserve coastal historic architectural resources of more than local significance which are valuable educational, scientific, associative or aesthetic resources." No significant coastal historic architectural resources are located within the project area; therefore, this policy is not applicable.

The Proposed Action would be consistent with applicable policies designed to protect natural and cultural resource areas of environmental concern.

2.2 GENERAL POLICY GUIDELINES

The North Carolina CAMA sets forth 11 General Policy Guidelines, addressing:

- Shoreline erosion policies;
- Shorefront access policies;
- Coastal energy policies;
- Post-disaster policies;
- Floating structure policies;
- Mitigation policies;
- Coastal water quality policies;
- Policies on use of coastal airspace;
- Policies on water- and wetland-based target areas for military training areas;
- Policies on beneficial use and availability of materials resulting from the excavation or maintenance of navigational channels; and
- Policies on ocean mining.

The purpose of these rules is to establish generally applicable objectives and policies to be followed in the public and private use of land and water areas within the coastal area of North Carolina. Following is an analysis of the applicability of these policies to the Proposed Action and the project's lack of impact on North Carolina's coastal zone.

2.2.1 15A NCAC 7M.0200 (Shoreline Erosion Policies)

No shorelines are included in the project area for the Proposed Action; therefore, these policies are not applicable.

2.2.2 15A NCAC 7M.0300 (Shorefront Access Policies)

Due to extensive military training, MCIEAST-MCB CAMLEJ is a closed military installation, where the public has not historically had beach access or uncontrolled water access (boat launches). Additionally, the Proposed Action involves no new facilities, operations or activities that would change the public's ability to access the beach or water around the installation; therefore, these policies are not applicable.

2.2.3 15A NCAC 7M.0400 (Coastal Energy Policies)

The Proposed Action does not involve the development of any major energy facilities; therefore, these policies are not applicable.

2.2.4 15A NCAC 7M.0500 (Post-disaster Policies)

These policies require that all state agencies prepare for disasters and to coordinate their activities in the event of a coastal disaster. MCIEAST-MCB CAMLEJ has pre-planned responses to address such an event and these measures are described in the Base Order P3440.6E, Destructive Weather Manual, which applies to all tenant commands on the installation including MARSOC. Therefore the Proposed Action is consistent with this policy.

2.2.5 15A NCAC 7M.0600 (Floating Structure Policies)

No floating structures are included in the Proposed Action; therefore, these policies are not applicable.

2.2.6 15A NCAC 7M.0700 (Mitigation Policy)

North Carolina's mitigation policy states that "Coastal ecosystems shall be protected and maintained as complete and functional systems by mitigating the adverse impacts of development as much as feasible, by enhancing, creating, or restoring areas with the goal of improving or maintaining ecosystem function and areal proportion." Impacts would be minimized through 1) proper site planning, 2) site selection, and 3) compliance with development standards.

Based on the preliminary site layout concepts the Proposed Action would impact approximately 0.42 ac (0.17 ha) of jurisdictional wetlands and 225 linear ft (69 m) of stream. Wetlands in the vicinity of the Proposed Action area are comprised primarily of riparian palustrine forested wetlands (0.31 ac [0.12 ha]) with a small area of non-riparian palustrine scrub-shrub wetlands (0.11 ac [0.04 ha]).

The proposed projects would avoid, to the maximum degree feasible, impacts to wetlands and surface waters regardless of wetland size or legal necessity for a permit, including adherence to the MCIEAST-MCB CAMLEJ policy of maintaining a minimum setback of 50 ft from wetlands wherever possible. Each project within the Proposed Action would undergo full design, wetlands to the maximum extent practicable. Mitigation for unavoidable impacts that remain would be achieved through on site mitigation, or through compensatory mitigation through a wetland mitigation bank, as agreed upon through permit coordination with the Environmental Protection Agency, United States Army Corps of Engineers, and North Carolina Division of Water Quality.

As stated in Section 2.2.7, stormwater runoff would be managed and controlled, thereby preventing siltation of nearby wetlands. Stormwater runoff would be managed in accordance with the MCIEAST-MCB CAMLEJ's state-approved Erosion and Sediment Control Plan, state-issued Stormwater Management Permit for Construction, and effective National Pollutant Discharge Elimination System permit requirements for the Installation. Best management practices would be used to avoid and minimize the release of sediments into stormwater. Mitigation plans would include both short-term (construction phase) and long-term (project life) features. In addition, construction effects would be controlled using standard management practices such as routine sweeping and wetting of exposed soils to reduce fugitive dust.

The Proposed Action would result in the loss of future RCW habitat and one future RCW partition (currently unoccupied but expected to be in the future based on MCIEAST-MCB CAMLEJ recovery goals and planning). Figure 4 depicts the future RCW habitat for the MARSOC complex. Not all of the forest within the Proposed Action area is considered suitable habitat; this decision is based on soils and vegetation primarily. Approximately 65 ac (26 ha) of RCW future habitat would be directly lost from construction of buildings and structures and the replacement of TLZ Owl. Roughly 30 of the 65 ac lost would be from the partition within which P1218 and P1219 are proposed for construction. This estimate includes only the direct footprint of the buildings and structures and does not include cleared, graded areas around these structures, and therefore underestimates the actual acreage lost. However, for the purposes of discussion, using only the 30 ac (12 ha) figure, this referenced partition would only have 116 ac (47 ha) remaining after construction of the proposed projects. The 116 ac (47 ha) would be fragmented and therefore of reduced value. In addition, the newly constructed adjacent structures would make management of these acres for RCW (particularly through prescribed burning) very difficult. Therefore, the Proposed Action is expected to result in the loss of this partition. The remaining 35 ac (14 ha) lost would be from two other partitions. While this rough estimate underestimates the true acreage that would be lost, enough habitat is expected to remain in these partitions for the RCW to continue to be successful in the future. Although construction at the MARSOC Complex would result in the loss of future RCW habitat, MCIEAST-MCB CAMLEJ does not expect this loss to jeopardize MCIEAST-MCB CAMLEJ's ability to meet the recovery goal of 173 active clusters and mitigation is not warranted.

The Proposed Action would not adversely affect any other Federally-listed threatened or endangered species, as none are known to occur in the proposed project areas. There would be a loss of forested wetland habitat, but the habitat does not support threatened or endangered species populations, with the exception of forested areas designated as future habitat for RCW, nor is it expected to be habitat suitable for known threatened and endangered species that occur at MCIEAST-MCB CAMLEJ.

As described previously, several other species at risk, including state protected species, have the potential to occur at MCIEAST-MCB CAMLEJ. However, none are known to occur within the proposed project site based on habitat requirements of the species.

No cultural resource impacts are anticipated, but if during construction any site of potential historical or archaeological significance is encountered, the Director, Environmental Management would be notified. The Director, Environmental Management would order actions in the vicinity halted and the area marked. The Director, Environmental Management would immediately notify the MCIEAST-MCB CAMLEJ archaeologist.

Other permits and approvals for the Proposed Action include:

- Clean Water Act, Section 404 wetland permit from the United States Army Corps of Engineers (Nationwide or Individual Permit depending on the quantity of wetlands and waters of the United States affected);
- Clean Water Act, Section 401 Water Quality Certification from the North Carolina Department of Environment and Natural Resources, Division of Water Quality;

- Erosion and Sediment Control Plan approval by North Carolina Department of the Environment and Natural Resources, Division of Land Resources, Land Quality Section;
- Stormwater Management Permit from the North Carolina Department of Environment and Natural Resources, Division of Water Quality;
- Water Connection Permit from NCDENR, Public Water Supply Section;
- Stormwater Management Permit from the NCDENR, Division of Water Quality;
- Non-Discharge Sewer Extension Permit from NCDENR, Division of Water Quality, Non-Discharge Branch;
- Concurrence from the United States Fish and Wildlife Service (USFWS) on informal consultation under the Endangered Species Act (ESA) regarding red-cockaded woodpecker (including compliance with the 2006 revision of *MCIEAST-MCB CAMLEJ's Recovery Plan for the Red-Cockaded Woodpecker)*;
- Compliance with the Clean Air Act; and
- Anti-terrorism/Force Protection (AT/FP) security requirements in accordance with Marine Corps Order P5530.14 dated 21 December 2000.

With the above mitigation and minimization measures in place, the Proposed Action would be consistent with North Carolina's mitigation policy.

2.2.7 15A NCAC 7M.0800 (Coastal Water Quality Policies)

The proposed construction activity would have no effect on coastal water quality. The Proposed Action includes no facilities or new operations that would directly impact coastal waters through new discharges. Impacts from runoff during construction and stormwater after construction would be minimized through the means discussed below.

Stormwater runoff would be managed and controlled in accordance with MCIEAST-MCB CAMLEJ's state-approved Erosion and Sediment Control Plan, state-issued Stormwater Management Permit for Construction, and effective National Pollutant Discharge Elimination System (NPDES) permit requirements for the Installation. MCIEAST-MCB CAMLEJ received a NPDES Phase I Stormwater permit in August 2004 and a NPDES Phase II Stormwater permit in February 2011.

Best management practices would be used to avoid contamination of stormwater and mitigate for both short-term (construction phase) and long-term (project life) impacts. Short-term practices would include erosion and sediment controls. Prior to construction, approval would be obtained from the North Carolina Department of Environment and Natural Resources on all plans. Erosion and sediment control devices could include sediment fences, dust suppressors, and temporary seeding and matting. Long-term measures would include planting grass on bare areas, landscaping in select areas with native species to the maximum extent practicable, and building stormwater retention ponds or other approved stormwater management structures. These vegetation and structural stormwater control devices would aid in the control of stormwater runoff and ensure effective and continuous control of erosion and pollution. Impacts to water quality would be further avoided by adherence to standard procedures governing hazardous materials during the construction phase and for the duration of the project. As a result, the Proposed Action is not expected to impair coastal water quality.

The project would not be located in a primary nursery area, but could have short-term indirect impacts to a special secondary nursery. These impacts would be avoided to the greatest extent possible through best management practices and site planning. Implementation of the Proposed Action would be consistent with coastal water quality policies.

2.2.8 15A NCAC 7M.0900 (Policies on Use of Coastal Airspace)

The Proposed Action includes no change to the nature or scope of military air operations, and no change to the boundaries or use of existing airspace. Therefore, these policies are not applicable.

2.2.9 15A NCAC 7M.1000 (Policies on Water- and Wetland-Based Target Areas for Military Training Areas)

No water- or wetland-based target areas or military training areas would be part of the Proposed Action; therefore, these policies are not applicable.

2.2.10 15A NCAC 7M.1100 (Policies on Beneficial Use and Availability of Materials Resulting From the Excavation or Maintenance of Navigational Channels)

No excavation or maintenance of navigational channels would be required for the Proposed Action; therefore, these policies are not applicable.

2.2.11 15A NCAC 7M.1200 (Policies on Ocean Mining)

No ocean mining would be part of the Proposed Action; therefore, these policies are not applicable.

3.0 ONSLOW COUNTY COASTAL MANAGEMENT POLICIES

The North Carolina Coastal Area Management act (CAMA) requires local governments in each of the 20 coastal counties in the state to prepare and implement a land use plan and ordinances for its enforcement consistent with established federal and state policies. Specifically, policy statements are required on resource protection; resource production and management; economic and community development; continuing public participation; and storm hazard mitigation, post-disaster recovery, and evacuation plans. Upon approval by the North Carolina Coastal Resources Commission, the plan becomes part of the North Carolina Coastal Management Program.

The Onslow County Comprehensive Plan (CAMA Core Land Use Plan), adopted by the Onslow County Board of Commissioners on October 19, 2009 and certified by the Coastal Resource Commission on January 13, 2010, addresses land use planning in relation to the CAMA. According to this Comprehensive Land Use Plan, Camp Lejeune is zoned as a Military Reservation and is limited to activities determined to be appropriate by the military. As the proposed activity has been requested by authorities at Camp Lejeune, the Proposed Action on MCIEAST-MCB CAMLEJ would be consistent with the operation of the Camp Lejeune Military Reservation, the applicable policies of the North Carolina Coastal Management Program, and Onslow County's comprehensive plan policies, for the reasons described throughout this Coastal Consistency Determination.

4.0 CONCLUSION

In conclusion, after careful consideration of the Proposed Action, the USMC has determined that implementation of the Proposed Action would be fully consistent with the relevant enforceable policies of protecting North Carolina's coastal zone. This was based on review of the proposed project against the relevant NOAA-approved enforceable policies of North Carolina's Coastal Management Program and Onslow County's comprehensive plan policies.

Figure 1 MARSOC Complex Location

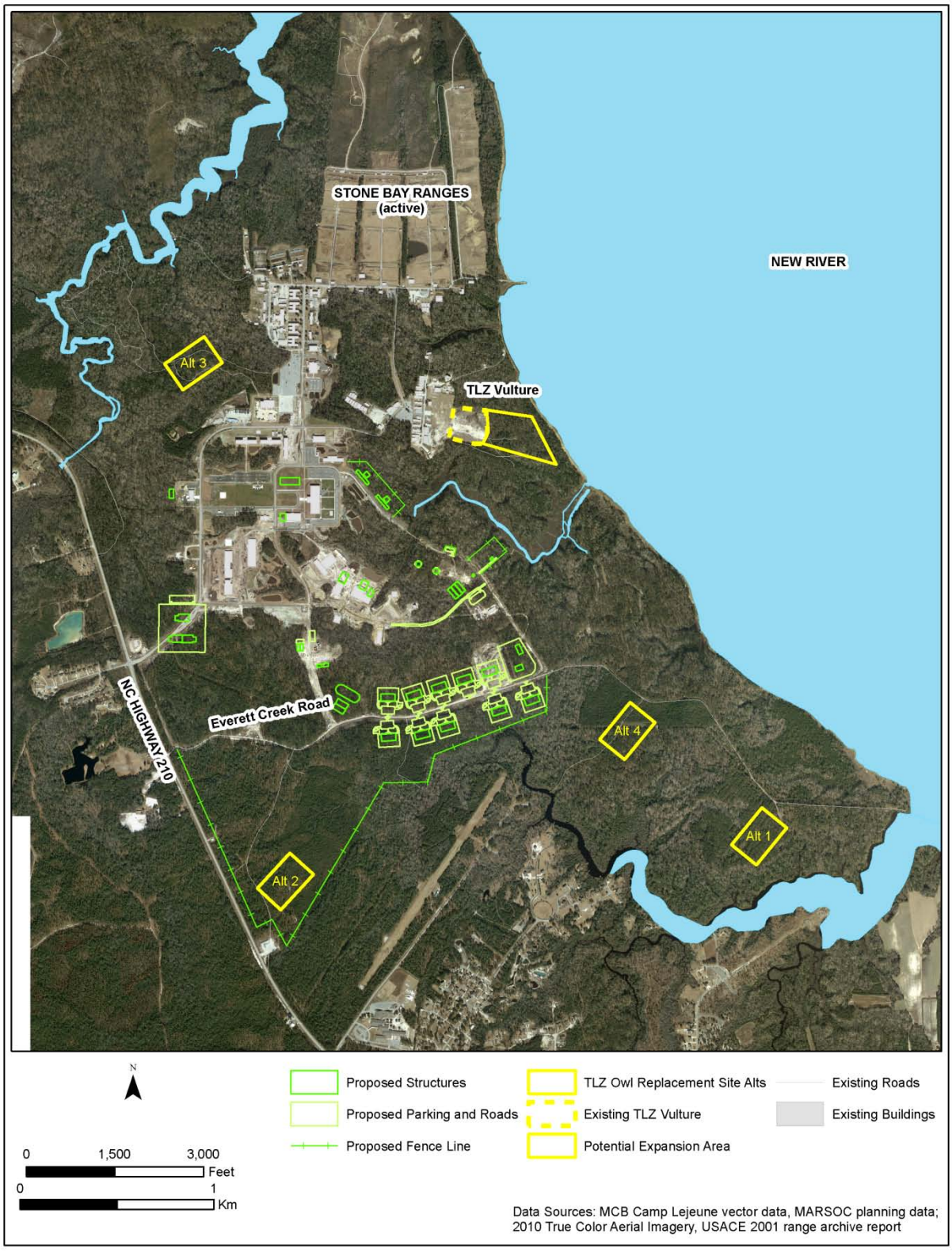

Figure 2 Project Locations

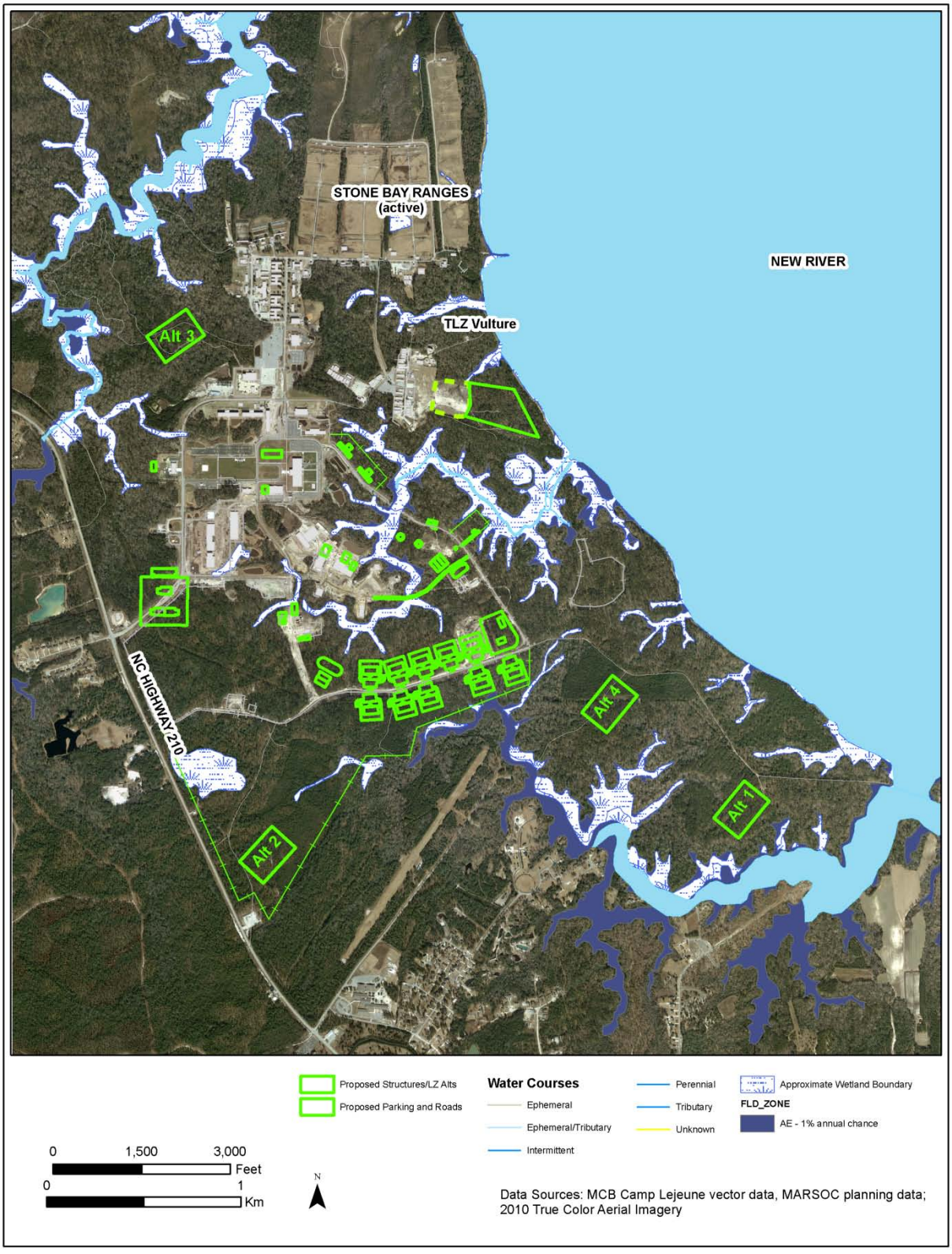

Figure 3 Wetlands and Floodplains in Project Area

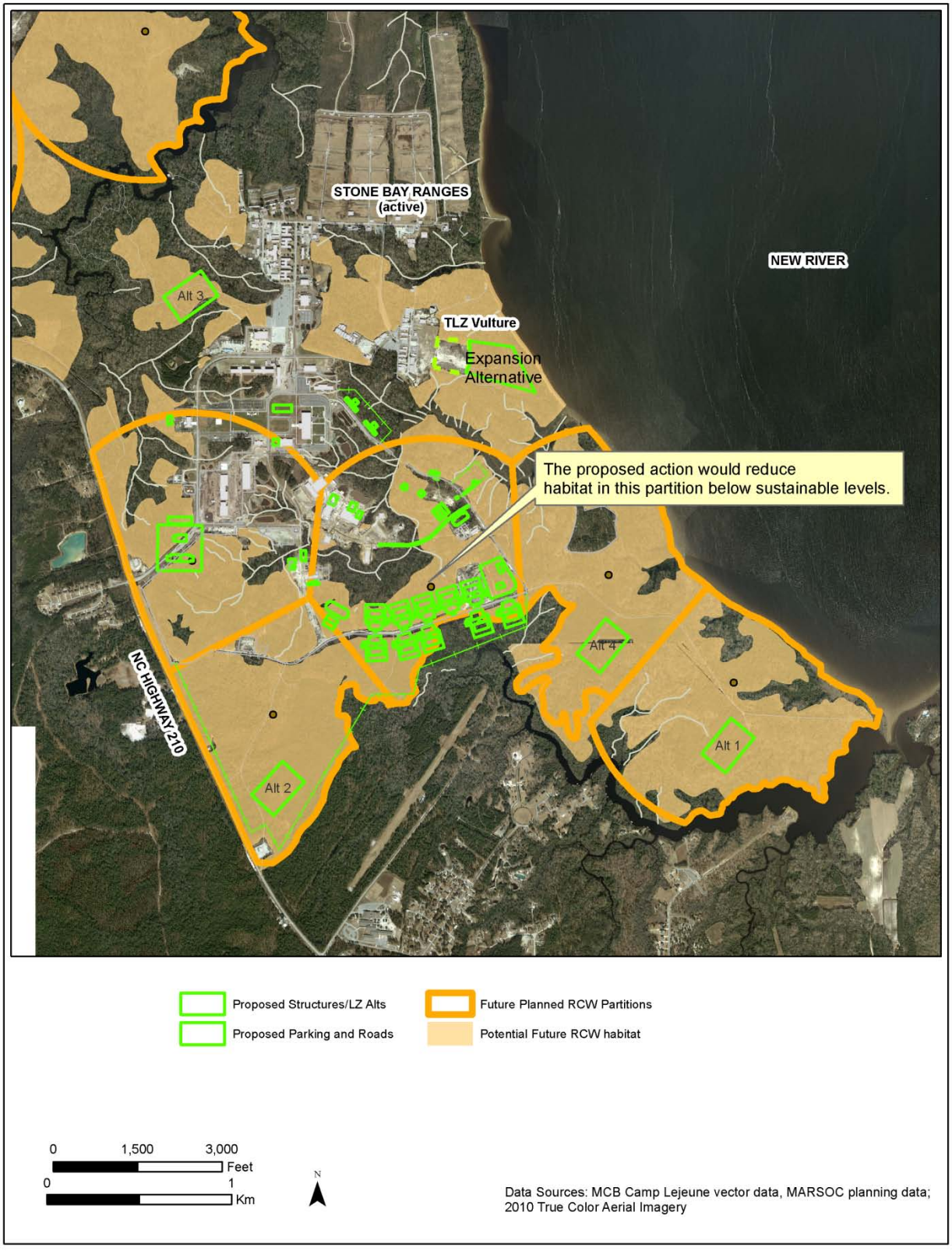

Figure 4 Future Red-cockaded Woodpecker Habitat

APPENDIX C – AIR QUALITY CALCULATIONS

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Proposed Construction Projects for MARSOC

Project No.	Construction Year	Assumed Year of Full Occupancy	Facility Type	Description	Size (SF)	Additional Paved Parking Area or Paved Area (SF)	Estimated Boiler Heat Input Capacity (MMBTU/hr) [1]	EG (hp)	Number of EGs [2]
P1440	2012	2013	Survival, Evasion, Resistance, and Escape (SERE) Pre-engineered bldgs	3 new bldgs as training labs, instructor and admin space.	12,000	0	0.3	100	1
P1218	2013 - 2014	2015	SOF MSOB Company/Team Facs.	A team operations fac and Battalion HQ for 3d MSSOB, with 800,000 SF existing gravel roadway	236,795	600,000	5.9	600	3
P1393	2013 - 2014	2015	SOF SERE Training Fac	SERE training facility	11,205	230,000	0.3	100	1
P1395	2014 - 2015	2015	SOF Marine Special Operations Regiment (MSOR) HQ	A separate regimental HQ fac	30,000	43,600	0.8	130	1
CDC	2014 - 2015	2015	Child development ctr	Child development center w/ 240 seats	22,370	21,000	0.6	150	1

P1391	2014 - 2015	2015	SOF Sustainment Training Complex	Various training/range facs	89,978	280,000	2.2	230	2
P1362	2014 - 2015	2015	SOF Performance Resiliency Center	Facs for admin, physical therapy, physical performance education, nutrition education and field house	39,288	84,000	1.0	130	2
P1433	2014 - 2015	2015	BEQ	Multi-story with capacity for 240 individuals	61,871	10,000	1.5	200	2
P1396	2015	2016	SOF Intelligence/ Operations Expansion	Expansion of existing RR405 fac	39,568		1.0	130	2
P1219	2016 - 2017	2018	SOP MSOB Company/Team Facs	A team operations fac and Battalion HQ for 2d MSSOB, with 800,000 SF existing gravel roadway	236,795	1,400,000	5.9	600	3
P1392	2016 - 2017	2018	SOF Military Working Dog Facility	SOF military working dog fac with admin space and 20 kennels	7,201	13,500	0.2	0	1
P1394	2016 - 2017	2018	SOF Motor Transport Maint Expansion	Add'l and consolidated maint/oper facs	63,000	714,000	1.6	200	2

P1410	2017 - 2018	2018	SOF EOD Expansion	Planning, admin, training, and storage facs	5,920	18,000	0.1	0	1
P1284	2017 - 2018	2018	SOF Training Tank Expansion	Expansion of exist. RR460 fac	34,122	5,000	0.9	120	2
P1411	2017 - 2018	2018	SOF Paraloft Expansion	Expansion of exist. RR460 fac	25,004	22,000	0.6	150	1
P1288	2017 - 2018	2018	SOF Combat Srv Sup Fac	HQ, operations, and maint support fac	32,292	246,000	0.8	130	2

(1) Assumed at 25 Btu/hr/SF

(2) Assumed number of units

Construction and Occupancy Periods

C - Facility under construction

O - Facility occupied

Calendar Year								
2012	2013	2014	2015	2016	2017	2018	2019	2020
Projects								
P1440 (C)	P1440 (O)	P1440 (O)	P1440 (O)	P1440 (O)	P1440 (O)	P1440 (O)	P1440 (O)	2020 and thereafter - same as 2019
	P1218 (C)	P1218 (C)	P1218 (O)	P1218 (O)	P1218 (O)	P1218 (O)	P1218 (O)	
	P1393 (C)	P1393 (C)	P1393 (O)	P1393 (O)	P1393 (O)	P1393 (O)	P1393 (O)	
		P1395 (C)	P1395 (C)	P1395 (O)	P1395 (O)	P1395 (O)	P1395 (O)	
		CDC (C)	CDC (C)	CDC (O)	CDC (O)	CDC (O)	CDC (O)	
		P1391 (C)	P1391 (C)	P1391 (O)	P1391 (O)	P1391 (O)	P1391 (O)	
		P1362 (C)	P1362 (C)	P1362 (O)	P1362 (O)	P1362 (O)	P1362 (O)	
		P1433 (C)	P1433 (C)	P1433 (O)	P1433 (O)	P1433 (O)	P1433 (O)	
			P1396 (C)	P1396 (O)	P1396 (O)	P1396 (O)	P1396 (O)	
				P1219 (C)	P1219 (O)	P1219 (O)	P1219 (O)	
				P1392 (C)	P1392 (O)	P1392 (O)	P1392 (O)	

				P1394 (C)	P1394 (O)	P1394 (O)	P1394 (O)	
					P1410 (C)	P1410 (O)	P1410 (O)	
					P1284 (C)	P1284 (O)	P1284 (O)	
					P1411 (C)	P1411 (O)	P1411 (O)	
					P1288 (C)	P1288 (O)	P1288 (O)	

Summary of Estimated Annual Emissions

Criteria Pollutants

CY	tons/yr				
	VOC	**CO**	**NOx**	**SO_2**	**PM**
2012	0.3	1	3	0.2	0.2
2013	2	9	26	2	2
2014	4	16	49	3	3
2015	4	21	40	5	4
2016	6	36	62	8	6
2017	8	44	90	10	8
2018	6	47	67	11	7
2019	5	44	44	11	6

Greenhouse Gases

CY	metric tons/yr			
	CO2	**CH4**	**N2O**	**CO2 Equiv**
2012	118	0	0	123
2013	703	1	0	739
2014	968	1	0	1015
2015	6894	1	1	7229
2016	14672	2	2	15141
2017	15042	2	2	15555
2018	15042	2	2	15555
2019	24360	1	3	25356

ESTIMATED ANNUAL EMISSIONS

2012 - Criteria Pollutants

Project	Facility Status	Emission Source	Criteria Pollutants, tons/yr				
			VOC	**CO**	**NOx**	**SO_2**	**PM**
P1440	Construction	Site clearing	0.1	0.2	0.8	0.1	0.1
		Bldg construction	0.2	0.5	2.1	0.1	0.2
		On-Road Veh.	0.1	0.5	0.3	0.001	0.02
Total Annual Emissions			0.3	1.2	3.3	0.2	0.2

2012 - Greenhouse Gases

Project	Facility Status	Emission Source	GHG, mT/yr			
			CO2	**CH4**	**N2O**	**CO2 Equiv**
P1440	Under construction	Site clearing	9.9	0.02	0.001	10.8
		Bldg construction	26.4	0.06	0.004	28.8
		On-Road Veh.	81.7	0.01	0.005	83.3
Total Annual Emissions			118	0.1	0.01	123

2013 - Criteria Pollutants

Project	Facility Status	Emission Source	Criteria Pollutants, tons/yr				
			VOC	**CO**	**NOx**	**SO_2**	**PM**
P1440	Occupied	Bldg energy use	0.0	0.5	0.3	0.1	0.1
		Boilers	0.01	0.1	0.1	0.01	0.01
		Emergency Gen.	0.0	0.06	0.3	0.02	0.02
P1218, P1393	Under	Site clearing	0.4	1.0	4.4	0.3	0.3

	construction	Paved area constr.	0.8	2.3	10.4	0.7	0.7
		Bldg construction.	0.7	2.0	8.9	0.6	0.6
		On-Road Veh.	0.3	2.7	1.6	0.0	0.1
Total Annual Emissions			2	9	26	2	2

2013 - Greenhouse Gases

Project	Facility Status	Emission Source	GHG, mT/yr			
			CO2	**CH4**	**N2O**	**CO2 Equiv**
P1440	Occupied	Bldg energy use	0	0.003	0.04	12
		Boilers	0.01	0.001	0.01	2
		Emergency Gen.	4	0.01	0.000	4
P1218, P1393	Under construction	Site clearing	55	0.1	0.01	60
		Paved area constr.	127	0.3	0.02	126
		Bldg construction.	109	0.2	0.02	119
		On-Road Veh.	409	0.04	0.02	417
Total Annual Emissions			703	1	0.1	739

2014 - Criteria Pollutants

Project	Facility Status	Emission Source	Criteria Pollutants, tons/yr				
			VOC	**CO**	**NOx**	**SO_2**	**PM**
P1440	Occupied	Bldg energy use	0.0	0.5	0.3	0.1	0.1
		Boilers	0.01	0.05	0.09	0.01	0.01
		Emergency Gen.	0.02	0.06	0.3	0.02	0.02
P1218, P1393	Under	Site clearing	0.4	1.0	4.4	0.3	0.3

	construction	Paved area constr.	0.8	2.3	10	0.7	0.7
		Bldg construction.	0.7	2.0	9	0.6	0.6
		On-Road Veh.	0.3	2.7	1.6	0.00	0.08
P1395, CDC, P1391, P1362, and P1433	Under construction	Site clearing	0.2	0.5	2.5	0.2	0.2
		Paved area constr.	0.8	2.3	10	0.7	0.7
		Bldg construction.	0.7	1.9	8.7	0.6	0.6
		On-Road Veh.	0	3	2	0	0
Total Annual Emissions			4	16	49	3	3

2014 - Greenhouse Gases

Project	Facility Status	Emission Source	GHG, mT/yr			
			CO2	**CH4**	**N2O**	**CO2 Equiv**
P1440	Occupied	Bldg energy use	0	0.00	0	12
		Boilers	0.01	0.00	0.01	1.87
		Emergency Gen.	4	0	0	4
P1218, P1393	Under construction	Site clearing	55	0	0	60
		Paved area constr.	127	0	0	126
		Bldg construction.	109	0	0	119
		On-Road Veh.	409	0	0	417
P1395, CDC, P1391, P1362, and P1433	Under construction	Site clearing	30	0	0	33
		Paved area constr.	127	0	0	126
		Bldg construction.	107	0.2	0.02	117
		On-Road Veh.	0	0	0	0
Total Annual Emissions			968	1	0	1015

2015 - Criteria Pollutants

Project	Facility Status	Emission Source	Criteria Pollutants, tons/yr				
			VOC	**CO**	**NOx**	**SO_2**	**PM**
P1440	Occupied	Bldg energy use	0.0	0.5	0.3	0.1	0.1
		Boilers	0.01	0.05	0.09	0.01	0.01
		Emergency Gen.	0.02	0.06	0.3	0.02	0.02
P1218, P1393	Occupied	Bldg energy use	1.0	9.5	5.2	2.3	1.1
		Boilers	0.2	1.1	2.0	0.2	0.1
		Emergency Gen.	0.1	1.0	4.3	0.3	0.4
P1395, CDC, P1391, P1362, and P1433	Under construction	Site clearing	0.2	0.5	2.5	0.2	0.2
		Paved area constr.	0.8	2.3	10	0.7	0.7
		Bldg construction.	0.7	1.9	8.7	0.6	0.6
		On-Road Veh.	0	3	2	0	0
P1396	Under construction	Site clearing	0.1	0.2	1.0	0.1	0.1
		Bldg construction	0.3	0.8	3.5	0.2	0.3
		On-Road Veh.	0.10	0.80	0.47	0.00	0.02
Total Annual Emissions			4	21	40	5	4

2015 - Greenhouse Gases

Project	Facility Status	Emission Source	GHG, mT/yr			
			CO2	**CH4**	**N2O**	**CO2 Equiv**
P1440	Occupied	Bldg energy use	0	0	0	12
		Boilers	0	0	0	2
		Emergency Gen.	4	0	0	4
P1218, P1393	Occupied	Bldg energy use	6397	0	1	6653

		Boilers	0	0	0	39
		Emergency Gen.	68	0	0	78
P1395, CDC, P1391, P1362, and P1433	Under construction	Site clearing	30	0	0	33
		Paved area constr.	127	0	0	126
		Bldg construction.	107	0	0	117
		On-Road Veh.	0	0	0	0
P1396	Under construction	Site clearing	12	0	0	13
		Bldg construction	26	0.06	0	29
		On-Road Veh.	123	0.01	0.01	125
Total Annual Emissions			6894	1	1	7229

2016 - Criteria Pollutants

Project	Facility Status	Emission Source	Criteria Pollutants, tons/yr				
			VOC	**CO**	**NOx**	**SO_2**	**PM**
P1440	Occupied	Bldg energy use	0.0	0.5	0.3	0.1	0.1
		Boilers	0.01	0.05	0.09	0.01	0.01
		Emergency Gen.	0.02	0.06	0.3	0.02	0.02
P1218, P1393	Occupied	Bldg energy use	1.0	9.5	5.2	2.3	1.1
		Boilers	0.2	1.1	2.0	0.2	0.1
		Emergency Gen.	0.14	0.99	4.3	0.29	0.39
P1395, CDC, P1391, P1362, and P1433	Occupied	Bldg energy use	1.0	9.3	5.1	2.2	1.1
		Boilers	0.1	1.1	1.9	0.2	0.1
		Emergency Gen.	0.3	0.9	4.1	0.3	0.3
P1396	Occupied	Bldg energy use	0.2	1.5	0.8	0.4	0.2
		Boilers	0.0	0.2	0.3	0.0	0.0

		Emergency Gen.	0.1	0.2	0.8	0.0	0.1
P1219, P1392, P1394	Under construction	Site clearing	1	2	9	1	1
		Paved area constr.	1	3	16	1	1
		Bldg construction	1	2	11	1	1
		On-Road Veh.	0	3	2	0	0
Total Annual Emissions			6	36	62	8	6

2016 - Greenhouse Gases

Project	Facility Status	Emission Source	GHG, mT/yr			
			CO2	**CH4**	**N2O**	**CO2 Equiv**
P1440	Occupied	Bldg energy use	0	0	0	12
		Boilers	0	0	0	2
		Emergency Gen.	4	0	0	4
P1218, P1393	Occupied	Bldg energy use	6397	0	1	6653
		Boilers	0	0	0	39
		Emergency Gen.	68	0	0	78
P1395, CDC, P1391, P1362, and P1433	Occupied	Bldg energy use	6281	0	0	6376
		Boilers	0	0	0	38
		Emergency Gen.	50	0	0	54
P1396	Occupied	Bldg energy use	1021	0	0	1061
		Boilers	0	0	0	6.2
		Emergency Gen.	9	0	0	10
P1219, P1392, P1394	Under construction	Site clearing	109	0	0	119
		Paved area constr.	191	0	0	126

		Bldg construction	135	0	0	147	
		On-Road Veh.	409	0	0	417	
Total Annual Emissions			14672	2	2	15141	

2017 - Criteria Pollutants

Project	Facility Status	Emission Source	Criteria Pollutants, tons/yr				
			VOC	**CO**	**NOx**	**SO_2**	**PM**
P1440	Occupied	Bldg energy use	0.0	0.5	0.3	0.1	0.1
		Boilers	0.01	0.05	0.1	0.01	0.01
		Emergency Gen.	0.0	0.1	0.3	0.0	0.0
P1218, P1393	Occupied	Bldg energy use	1.0	9.5	5.2	2.3	1.1
		Boilers	0.2	1.1	2.0	0.2	0.1
		Emergency Gen.	0.14	0.99	4.3	0.29	0.39
P1395, CDC, P1391, P1362, and P1433	Occupied	Bldg energy use	1.0	9.3	5.1	2.2	1.1
		Boilers	0.1	1.1	1.9	0.2	0.1
		Emergency Gen.	0.3	0.9	4.1	0.3	0.3
P1396	Occupied	Bldg energy use	0.2	1.5	0.8	0.4	0.2
		Boilers	0.0	0.2	0.3	0.0	0.0
		Emergency Gen.	0.1	0.2	0.8	0.0	0.1
P1219, P1392, P1394	Under construction	Site clearing	1	2	9	1	1
		Paved area constr.	1	3	16	1	1
		Bldg construction	1	2	11	1	1
		On-Road Veh.	0	3	2	0	0
P1410, P1284,	Under	Site clearing	0	2	9	1	1

P1411, P1288	construction	Paved area constr.	1	3	16	1	1
		Bldg construction	0	1	3	0	0
		On-Road Veh.	0	2	1	0	0
Total Annual Emissions			8	44	90	10	8

2017 - Greenhouse Gases

Project	Facility Status	Emission Source	GHG, mT/yr			
			CO2	**CH4**	**N2O**	**CO2 Equiv**
P1440	Occupied	Bldg energy use	0	0	0	12
		Boilers	0	0	0	2
		Emergency Gen.	4	0	0	4
P1218, P1393	Occupied	Bldg energy use	6397	0	1	6653
		Boilers	0	0	0	38
		Emergency Gen.	50	0	0	54
P1395, CDC, P1391, P1362, and P1433	Occupied	Bldg energy use	6281	0	0	6376
		Boilers	0	0	0	38
		Emergency Gen.	50	0	0	54
P1396	Occupied	Bldg energy use	1021	0	0	1061
		Boilers	0	0	0	6.2
		Emergency Gen.	9	0	0	10
P1219, P1392, P1394	Under construction	Site clearing	109	0	0	119
		Paved area constr.	191	0	0	126
		Bldg construction	135	0	0	147
		On-Road Veh.	409	0	0	417

P1410, P1284, P1411, P1288	Under construction	Site clearing	26	0	0	28
		Paved area constr.	85	0	0	126
		Bldg construction	32	0	0	35
		On-Road Veh.	245	0	0	250
Total Annual Emissions			15042	2	2	15555

2018 - Criteria Pollutants

Project	Facility Status	Emission Source	Criteria Pollutants, tons/yr				
			VOC	**CO**	**NOx**	**SO_2**	**PM**
P1440	Occupied	Bldg energy use	0.0	0.5	0.3	0.1	0.1
		Boilers	0.01	0.05	0.1	0.01	0.01
		Emergency Gen.	0.0	0.1	0.3	0.0	0.0
P1218, P1393	Occupied	Bldg energy use	1.0	9.5	5.2	2.3	1.1
		Boilers	0.2	1.1	2.0	0.2	0.1
		Emergency Gen.	0.14	0.99	4.3	0.29	0.39
P1395, CDC, P1391, P1362, and P1433	Occupied	Bldg energy use	1.0	9.3	5.1	2.2	1.1
		Boilers	0.1	1.1	1.9	0.2	0.1
		Emergency Gen.	0.3	0.9	4.1	0.3	0.3
P1396	Occupied	Bldg energy use	0.2	1.5	0.8	0.4	0.2
		Boilers	0.0	0.2	0.3	0.0	0.0
		Emergency Gen.	0.1	0.2	0.8	0.0	0.1
P1219, P1392, P1394	Occupied	Bldg energy use	1	12	6	3	1
		Boilers	0	1	2	0	0
		Emergency Gen.	0	1	5	0	0

P1410, P1284, P1411, P1288	Under construction	Site clearing	0	2	9	1	1
		Paved area constr.	1	3	16	1	1
		Bldg construction	0	1	3	0	0
		On-Road Veh.	0	2	1	0	0
Total Annual Emissions			6	47	67	11	7

2018 - Greenhouse Gases

Project	Facility Status	Emission Source	GHG, mT/yr			
			CO2	**CH4**	**N2O**	**CO2 Equiv**
P1440	Occupied	Bldg energy use	0	0	0	12
		Boilers	0	0	0	2
		Emergency Gen.	4	0	0	4
P1218, P1393	Occupied	Bldg energy use	6397	0	1	6653
		Boilers	0	0	0	38
		Emergency Gen.	50	0	0	54
P1395, CDC, P1391, P1362, and P1433	Occupied	Bldg energy use	6281	0	0	6376
		Boilers	0	0	0	38
		Emergency Gen.	50	0	0	54
P1396	Occupied	Bldg energy use	1021	0	0	1061
		Boilers	0	0	0	6
		Emergency Gen.	9	0	0	10
P1219, P1392, P1394	Occupied	Bldg energy use	7918	0	1	8235
		Boilers	0	0	0	48
		Emergency Gen.	79	0	0	89

P1410, P1284, P1411, P1288	Under construction	Site clearing	26	0	0	28
		Paved area constr.	85	0	0	126
		Bldg construction	32	0	0	35
		On-Road Veh.	245	0	0	250
Total Annual Emissions			15042	2	2	15555

2019 and Thereafter - Criteria Pollutants

Project	Facility Status	Emission Source	Criteria Pollutants, tons/yr				
			VOC	**CO**	**NOx**	**SO_2**	**PM**
P1440	Occupied	Bldg energy use	0.0	0.5	0.3	0.1	0.1
		Boilers	0.01	0.1	0.1	0.01	0.01
		Emergency Gen.	0.0	0.1	0.3	0.0	0.0
P1218, P1393	Occupied	Bldg energy use	1.0	9	5	2.3	1.1
		Boilers	0.2	1.1	2.0	0.2	0.1
		Emergency Gen.	0.1	1.0	4.3	0.3	0.4
P1395, CDC, P1391, P1362, and P1433	Occupied	Bldg energy use	1.0	9.3	5.1	2.2	1.1
		Boilers	0.1	1.1	1.9	0.2	0.1
		Emergency Gen.	0.3	0.9	4.1	0.3	0.3
P1396	Occupied	Bldg energy use	0.2	1.5	0.8	0.4	0.2
		Boilers	0.0	0.2	0.3	0.0	0.0
		Emergency Gen.	0.1	0.2	0.8	0.0	0.1
P1219, P1392, P1394	Occupied	Bldg energy use	1	12	6	3	1
		Boilers	0	1	2	0	0
		Emergency Gen.	0	1	5	0	0

P1410, P1284, P1411, P1288	Occupied	Bldg energy use	0	4	2	1	0
		Boilers	0	0	1	0	0
		Emergency Gen.	0	0	2	0	0
Total Annual Emissions			5	44	44	11	6

2019 and Thereafter - Greenhouse Gases

Project	Facility Status	Emission Source	GHG, mT/yr			
			CO2	**CH4**	**N2O**	**CO2 Equiv**
P1440	Occupied	Bldg energy use	0	0	0	12
		Boilers	0	0	0	2
		Emergency Gen.	4	0	0	4
P1218, P1393	Occupied	Bldg energy use	6397	0	1	6653
		Boilers	0	0	0	39
		Emergency Gen.	68	0	0	78
P1395, CDC, P1391, P1362, and P1433	Occupied	Bldg energy use	6281	0	0	6376
		Boilers	0	0	0	38
		Emergency Gen.	50	0	0	54
P1396	Occupied	Bldg energy use	1021	0	0	1061
		Boilers	0	0	0	6.2
		Emergency Gen.	9	0	0	10
P1219, P1392, P1394	Occupied	Bldg energy use	7918	0	1	8235
		Boilers	0	0	0	48
		Emergency Gen.	79	0	0	89
P1410, P1284,	Occupied	Bldg energy use	2511	0	0	2611

P1411, P1288		Boilers	0.05	0.01	0.05	15
		Emergency Gen.	23	0	0	25
Total Annual Emissions			24360	1	3	25356

CONSTRUCTION EQUIPMENT EXHAUSTS

MAJOR CONSTRUCTION EQUIPMENT WITH ENGINE EMISSIONS

Equipment *	Engine Size Range (Hp)	Engine Size Used in Calc. (Hp)	General Construction Activities		
			Site Clearing, Landscaping, Utility Installation	Road and Parking Lot Construction	Building Construction
Dozer	300 - 800	300	✓	✓	✓
Skid steer loader	23 - 100	60	✓	✓	✓
Backhoe loader	100	100	✓	✓	✓
Grader	135 - 280	150	✓	✓	☐
Roller	50 - 170	110	☐	✓	☐
Concrete truck	250	250	☐	✓	✓
Trencher	11 - 24	15	☐	✓	☐
Dump truck	300 - 430	350	✓	✓	✓
Delivery truck	215 - 600	400	☐	✓	✓
Crane	250 - 746	450	☐	☐	✓
Compactor	175 - 630	300	☐	✓	☐
Paver - Asphalt	121 - 224	150	☐	✓	☐

Small gas-fired engines	2.5 - 30	10	✓	✓	✓

* Privately owned vehicle calculations are included in another spreadsheet.

EMISSION FACTORS FOR CRITERIA POLLUTANTS

Equipment	Load Factor	Criteria Pollutants (lb/hp-hr) [1]				
		VOC	CO	NOx	SO2	PM
Dozer	0.58	0.0025	0.0069	0.031	0.0021	0.0022
Skid steer loader	0.23					
Backhoe loader	0.21					
Grader	0.58					
Roller	0.23					
Concrete truck						
Trencher	0.23					
Dump truck						
Delivery truck						
Crane	0.58					
Compactor	0.58					
Paver - Asphalt	0.58	0.004	0.001			0.001
Small gas-fired engines		0.015	0.01	0.01	0.0006	0.0007

[1] AP-42, Sec. 11.1, except Paver Asphalt EF from Sec. 11.1 and Small gas-fired engines EF from Sec. 3.3

EMISSION FACTORS FOR GREENHOUSE GAS

Equipment	Load Factor	Greenhouse Gas (lb/MMBtu) [2]		
		CO2	CH4	N2O
Dozer	0.58	164	0.36	0.024
Skid steer loader	0.23			
Backhoe loader	0.21			
Grader	0.58			
Roller	0.23			
Concrete truck				
Trencher	0.23			
Dump truck				
Delivery truck				
Crane	0.58			
Compactor	0.58			
Paver - Asphalt	0.58			
Small gas-fired engines				

(2) CO2 and CH4 EFs from AP-42 Table 3.3-1; N2O EF from API's document titled Compendium of GHG Emission Methodologies for the Oil and Gas Industry dated 2004

EMISSION ESTIMATES

Construction Year: 2012; Project No.: P1440

General Construction Activities

- Site clearing, landscaping, utility installation
- Building construction

Site Clearing, Landscaping, and Utility Installation

Equipment	Estimated Operating Data	
	Hp	No. of Hrs/yr
Dozer	300	80
Skid steer loader	60	80
Backhoe loader	100	80
Grader	150	80
Dump truck	350	80
Small gas-fired engines	10	80

Criteria Pollutants	VOC	CO	NOx	SO_2	PM
tons/yr	0.07	0.18	0.81	0.05	0.06
GHG	CO2	CH4	N2O	CO2 Equiv	
mT/yr	9.9	0.02	0.001	10.8	

Building Construction

Equipment	Estimated Operating Data	
	Hp	No. of Hrs/Yr
Dozer	300	80
Skid steer loader	60	100
Backhoe loader	100	100

Concrete truck	250	100
Dump truck	350	100
Delivery truck	400	100
Crane	450	80
Small gas-fired engines	10	100

Criteria Pollutants	VOC	CO	NOx	SO_2	PM
tons/yr	0.2	0.5	2.1	0.1	0.2
GHG	**CO2**	**CH4**	**N2O**	**CO2 Equiv**	
mT/yr	26	0.1	0.004	29	

Construction Years: 2013 and 2014; Project Nos.: P1218 and P1393

General Construction Activities

- Site clearing, landscaping, utility installation
- Road and parking lot construction
- Building construction

Site Clearing, Landscaping, and Utility Installation

Equipment	Estimated Operating Data	
	Hp	No. of Hrs/yr
Dozer	300	440
Skid steer loader	60	440
Backhoe loader	100	440
Grader	150	440
Dump truck	350	440
Small gas-fired engines	10	440

Criteria Pollutants	VOC	CO	NOx	SO_2	PM
tons/yr	0.4	1.0	4.4	0.3	0.3
GHG	CO2	CH4	N2O	CO2 Equiv	
mT/yr	55	0.1	0.01	60	

Road and Parking Lot Construction

Equipment	Estimated Operating Data	
	Hp	No. of Hrs/Yr
Dozer	300	400
Skid steer loader	60	400
Backhoe loader	100	400
Grader	150	400
Roller	110	400
Concrete truck	250	400
Trencher	15	400
Dump truck	350	400
Delivery truck	400	400
Compactor	450	400
Paver - Asphalt	150	400
Small gas-fired engines	10	200

Criteria Pollutants	VOC	CO	NOx	SO_2	PM
tons/yr	0.83	2.30	10.37	0.69	0.74
GHG	CO2	CH4	N2O	CO2 Equiv	
mT/yr	127	0.3	0.02	126	

Building Construction

Equipment	Estimated Hp	Operating Data No. of Hrs/Yr
Dozer	300	331
Skid steer loader	60	413
Backhoe loader	100	413
Concrete truck	250	413
Dump truck	350	413
Delivery truck	400	413
Crane	450	331
Small gas-fired engines	10	413

Criteria Pollutants	VOC	CO	NOx	SO_2	PM
tons/yr	0.71	1.97	8.86	0.59	0.63
GHG	**CO2**	**CH4**	**N2O**	**CO2 Equiv**	
mT/yr	109	0.2	0.02	119	

Construction Years: 2014 and 2015; Project Nos.: P1395, P1391, P1362, and P1433

General Construction Activities

- Site clearing, landscaping, utility installation
- Road and parking lot construction
- Building construction

Site Clearing, Landscaping, and Utility Installation

Equipment	Estimated Hp	Operating Data No. of Hrs/yr
Dozer	300	244

Skid steer loader	60	244
Backhoe loader	100	244
Grader	150	244
Dump truck	350	244
Small gas-fired engines	10	244

Criteria Pollutants	VOC	CO	NOx	SO_2	PM
tons/yr	0.21	0.5	2.5	0.2	0.2
GHG	**CO2**	**CH4**	**N2O**	**CO2 Equiv**	
mT/yr	30	0.07	0.004	33	

Road and Parking Lot Construction

Equipment	Estimated Operating Data	
	Hp	No. of Hrs/Yr
Dozer	300	400
Skid steer loader	60	400
Backhoe loader	100	400
Grader	150	400
Roller	110	400
Concrete truck	250	400
Trencher	15	400
Dump truck	350	400
Delivery truck	400	400
Compactor	450	400
Paver - Asphalt	150	400
Small gas-fired engines	10	200

Criteria Pollutants	VOC	CO	NOx	SO_2	PM

tons/yr	0.8	2.3	10.4	0.7	0.7
GHG	**CO2**	**CH4**	**N2O**	**CO2 Equiv**	
mT/yr	127	0.3	0.02	126	

Building Construction

Equipment	Estimated Operating Data	
	Hp	No. of Hrs/Yr
Dozer	300	325
Skid steer loader	60	406
Backhoe loader	100	406
Concrete truck	250	406
Dump truck	350	406
Delivery truck	400	406
Crane	450	325
Small gas-fired engines	10	406

Criteria Pollutants	**VOC**	**CO**	**NOx**	**SO_2**	**PM**
tons/yr	0.72	1.94	8.72	0.58	0.62
GHG	**CO2**	**CH4**	**N2O**	**CO2 Equiv**	
mT/yr	107	0.2	0.02	117	

Construction Year: 2015; Project No.: P1396

General Construction Activities

- Site clearing, landscaping, utility installation
- Building construction

Site Clearing, Landscaping, and Utility Installation

Equipment	Estimated Operating Data	
	Hp	No. of Hrs/yr
Dozer	300	96
Skid steer loader	60	96
Backhoe loader	100	96
Grader	150	96
Dump truck	350	96
Small gas-fired engines	10	96

Criteria Pollutants	VOC	CO	NOx	SO_2	PM
tons/yr	0.08	0.22	0.97	0.06	0.07
GHG	**CO2**	**CH4**	**N2O**	**CO2 Equiv**	
mT/yr	12	0.03	0.002	13	

Building Construction

Equipment	Estimated Operating Data	
	Hp	No. of Hrs/Yr
Dozer	300	132
Skid steer loader	60	165
Backhoe loader	100	165
Concrete truck	250	165
Dump truck	350	165
Delivery truck	400	165
Crane	450	132

Small gas-fired engines	10	165

Criteria Pollutants	VOC	CO	NOx	SO_2	PM
tons/yr	0.3	0.8	3.5	0.2	0.3
GHG	**CO2**	**CH4**	**N2O**	**CO2 Equiv**	
mT/yr	26	0.1	0.004	29	

Construction Years: 2016 and 2017; Project Nos.: P1219, P1392, and P1394

General Construction Activities

- Site clearing, landscaping, utility installation
- Road and parking lot construction
- Building construction

Site Clearing, Landscaping, and Utility Installation

Equipment	Estimated Operating Data	
	Hp	No. of Hrs/yr
Dozer	300	876
Skid steer loader	60	876
Backhoe loader	100	876
Grader	150	876
Dump truck	350	876
Small gas-fired engines	10	876

Criteria Pollutants	VOC	CO	NOx	SO_2	PM
tons/yr	0.76	1.98	8.81	0.58	0.63
GHG	**CO2**	**CH4**	**N2O**	**CO2 Equiv**	

mT/yr	108.8	0.24	0.016	118.7

Road and Parking Lot Construction

Equipment	Estimated Operating Data	
	Hp	No. of Hrs/Yr
Dozer	300	600
Skid steer loader	60	600
Backhoe loader	100	600
Grader	150	600
Roller	110	600
Concrete truck	250	600
Trencher	15	600
Dump truck	350	600
Delivery truck	400	600
Compactor	450	600
Paver - Asphalt	150	600
Small gas-fired engines	10	400

Criteria Pollutants	VOC	CO	NOx	SO_2	PM
tons/yr	1.3	3.5	15.6	1.0	1.1
GHG	**CO2**	**CH4**	**N2O**	**CO2 Equiv**	
mT/yr	191	0.4	0.03	126	

Building Construction

Equipment	Estimated Operating Data	
	Hp	No. of Hrs/Yr
Dozer	300	409

Skid steer loader	60	512
Backhoe loader	100	512
Concrete truck	250	512
Dump truck	350	512
Delivery truck	400	512
Crane	450	409
Small gas-fired engines	10	512

Criteria Pollutants	VOC	CO	NOx	SO_2	PM
tons/yr	0.91	2.45	10.99	0.73	0.78
GHG	**CO2**	**CH4**	**N2O**	**CO2 Equiv**	
mT/yr	135	0.3	0.020	147	

Construction Years: 2017 and 2018; Project Nos.: P1410, P1284, P1411, and P1288

General Construction Activities

- Site clearing, landscaping, utility installation
- Road and parking lot construction
- Building construction

Site Clearing, Landscaping, and Utility Installation

Equipment	Estimated Operating Data	
	Hp	No. of Hrs/yr
Dozer	300	207
Skid steer loader	60	207
Backhoe loader	100	207
Grader	150	207

Dump truck	350	207
Small gas-fired engines	10	207

Criteria Pollutants	VOC	CO	NOx	SO_2	PM
tons/yr	0.18	1.98	8.81	0.58	0.63
GHG	**CO2**	**CH4**	**N2O**	**CO2 Equiv**	
mT/yr	25.7	0.06	0.004	28.1	

Road and Parking Lot Construction

Equipment	Estimated Operating Data	
	Hp	No. of Hrs/Yr
Dozer	300	267
Skid steer loader	60	267
Backhoe loader	100	267
Grader	150	267
Roller	110	267
Concrete truck	250	267
Trencher	15	267
Dump truck	350	267
Delivery truck	400	267
Compactor	450	267
Paver - Asphalt	150	267
Small gas-fired engines	10	133

Criteria Pollutants	VOC	CO	NOx	SO_2	PM
tons/yr	0.6	3.5	15.6	1.0	1.1
GHG	**CO2**	**CH4**	**N2O**	**CO2 Equiv**	
mT/yr	85	0.2	0.01	126	

Building Construction

Equipment	Estimated Operating Data	
	Hp	No. of Hrs/Yr
Dozer	300	97
Skid steer loader	60	122
Backhoe loader	100	122
Concrete truck	250	122
Dump truck	350	122
Delivery truck	400	122
Crane	450	97
Small gas-fired engines	10	122

Criteria Pollutants	VOC	CO	NOx	SO_2	PM
tons/yr	0.2	0.6	2.6	0.2	0.2
GHG	CO2	CH4	N2O	CO2 Equiv	
mT/yr	32	0.1	0.00	35	

Labor and Vehicle Trip Estimates

Construction Work	No. of Construction Years (Estimated)	No. of Personnel (Estimated Avg. Day)	No. of Privately Owned Vehicle Trips (Estimated Avg. Day)	Total No. of Privately Owned Vehicle Trips [(1)]	No. of Truck Trips (Estimated Avg. Day)	Total No. of Truck Trips [(1)]
Construction Year: 2012						
Project No. P1440: Three pre-engineered buildings (12,000 SF total)	1	20	8	1,800	12	540
Construction Years: CY 2013-2014						
Project Nos. P1218 and P1393: HQ buildings (approx. 429,600 SF); 1.63 million SF of paved area	2	100	40	18,000	60	5,400
Construction Years: CY 2014-2015						
Project Nos. P1395, P1391, P1362, and P1433: SOF MSOR HQ buildings, CDC, SOF Sustainment Training Complex, SOF Performance Resiliency Center, BED, and SOF Intelligence/Operations Expansion facilities (approx. total square footage: 243,500 SF); approx. 438,000 SF of paved areas	2	100	40	18,000	60	5,400

Construction Year: CY 2015						
Project No. P1396: Expansion of existing facility RR405 by addition of 39,568 SF	1	30	12	2,700	18	810
Construction Years: CY 2016-2017						
Project Nos. P1219, P1392, P1394: SOF MSOB Company and Team Facilities; SOF Military Working Dog Facility; and SOF Motor Transport Maint. Expansion (approx. total square footage: 307,000 SF; plus approx. 2.13 million SF of paved areas.	2	100	40	18,000	60	5,400
Construction Years: CY 2017-2018						
Project Nos P1410, P1284, P1411, and P1288: SOF EOD Expansion; SOF Training Tank Expansion; SOF Paraloft Expansion; and SOF Combat Facility Support Facility (approx. total square footage: 97,000 SF; plus 291,000 SF of paved areas.	1	60	24	5,400	36	1,620

[1] Assume 45 weeks/yr, 5 days per week, one 8 hr shift per day. Trip number is based on average day throughout the construction period listed.

On-Road Vehicles Related to MARSOC Construction Projects

Emission Factors

Criteria Pollutants [1]	VOC	CO	NOx	SO_2	PM
	lb/mi	lb/mi	lb/mi	lb/mi	lb/mi
Labor Commute; 50% Car	0.001	0.007	0.001	0.00001	0.00009
Delivery Trucks	0.002	0.014	0.016	0.00003	0.0006
Heavy Duty Diesel Trucks	0.002	0.009	0.027	0.00004	0.001
GHG [2]	CO2	CH4	N2O		
	kg/mi	g/L	g/L		
Labor Commute; 50% Car [3]	0.36	0.42	0.20		
Delivery Trucks [4]	1.5	0.07	0.2		
Heavy Duty Diesel Trucks [5]	1.7	0.13	0.08		

[1] SCAQMD Data (2007-2026)

[2] 2004 American Petroleum Institute (API) data

[3] Medium gas auto in city, at 22 miles per gallon; with oxidation catalyst

[4] Light duty diesel truck, at 15 miles/gal and with moderate emission control

[5] Heavy duty diesel trucks, at 7 miles per gallon and with moderate emission control

EMISSION ESTIMATES

Construction Year: 2012

Vehicle Type	No. of Trips/Yr	No. of Miles/Yr [6]
Labor Commute 50% Cars	1,800	90,000
Delivery Trucks	540	27,000
Heavy Duty Diesel Trucks	104	5,198

Criteria Pollutants	VOC	CO	NOx	SO_2	PM
tons/yr	0.07	0.53	0.32	0.001	0.02
GHG	CO2	CH4	N2O	CO2 Equiv	
mT/yr	82	0.007	0.005	83	

[6] Assumed 50 mile round trips

Construction Year: CY 2013-2014

Vehicle Type		No. of Trips/Yr	No. of Miles/Yr			
Labor Commute 50% Cars		9,000	450,000			
Delivery Trucks		2,700	135,000			
Heavy Duty Diesel Trucks		520	25,988			
Criteria Pollutants		VOC	CO	NOx	SO_2	PM
tons/yr		0.34	2.67	1.58	0.005	0.08
GHG		CO2	CH4	N2O	CO2 Equiv	
mT/yr		409	0.04	0.02	417	

Construction Years: CY 2014-2015

Vehicle Type	No. of Trips/Yr	No. of Miles/Yr			
Labor Commute 50% Cars	9,000	450,000			
Delivery Trucks	2,700	135,000			
Heavy Duty Diesel Trucks	520	25,988			
Criteria Pollutants	VOC	CO	NOx	SO_2	PM
tons/yr	0.34	2.67	1.58	0.00	0.08
GHG	CO2	CH4	N2O	CO2 Equiv	

mT/yr	409	0.04	0.02	417

Construction Year: CY 2015

Vehicle Type	No. of Trips/Yr		No. of Miles/Yr		
Labor Commute 50% Cars	2,700		135,000		
Delivery Trucks	810		40,500		
Heavy Duty Diesel Trucks	156		7,796		
Criteria Pollutants	**VOC**	**CO**	**NOx**	**SO_2**	**PM**
tons/yr	0.10	0.80	0.47	0.001	0.02
GHG	**CO2**	**CH4**	**N2O**	**CO2 Equiv**	
mT/yr	123	0.01	0.01	125	

Construction Years: CY 2016-2017

Vehicle Type	No. of Trips/Yr		No. of Miles/Yr		
Labor Commute 50% Cars	9,000		450,000		
Delivery Trucks	2,700		135,000		
Heavy Duty Diesel Trucks	520		25,988		
Criteria Pollutants	**VOC**	**CO**	**NOx**	**SO_2**	**PM**
tons/yr	0.34	2.67	1.58	0.00	0.08
GHG	**CO2**	**CH4**	**N2O**	**CO2 Equiv**	
mT/yr	409	0.04	0.02	417	

Construction Years: CY 2017-2018

Vehicle Type	No. of Trips/Yr		No. of Miles/Yr		
Labor Commute 50% Cars	5,400		270,000		
Delivery Trucks	1,620		81,000		
Heavy Duty Diesel Trucks	312		15,593		
Criteria Pollutants	**VOC**	**CO**	**NOx**	**SO_2**	**PM**
tons/yr	0.20	1.60	0.95	0.00	0.05
GHG	**CO2**	**CH4**	**N2O**	**CO2 Equiv**	
mT/yr	245	0.02	0.01	250	

Building Energy Consumption

Basic Information

Assumed Fuel Used	Diesel	
Delivered Energy Consumption Intensity [1]	90	thousand Btu/square foot/yr

Emission Factors

Criteria Pollutants [2]	VOC	CO	NOx[3]	SO_2[4]	PM
lb/MMBtu	0.09	0.85	0.47	0.202	0.1
GHG [4]	**CO2**	**CH4**	**N2O**		
lb/10^6 W-hr	2150	0.021	0.276		

[1] Refers to energy used on site (including purchased electricity). Ref: US Dept of Energy's 2008 Buildings Energy Data Book.

[2] AP-24 Section 3.4 (Large Stationary Diesel And All Stationary Dual-fuel Engines); controlled EF for NOx (as required by the Clean Air Interstate Rule; typical NOx control efficiencies range from 20 - 90%; 60% controlled efficiency assumed)

[3] Based on USEPA (clean energy information; 4 lbs/MW-hr).

[4] Assumed sulfur content of 0.2%.

[5] 2004 American Petroleum Institute Data

EMISSION ESTIMATES

Project No.	Square Footage	Delivered Energy (MMBtu/yr)	Emissions (tons/yr)
Construction Year: 2012; Assumed Full Occupancy: CY 2013			

P1440	12,000	1,080					
Criteria Pollutants			**VOC**	**CO**	**NOx**	**SO_2**	**PM**
Tons/yr			0.0	0.5	0.3	0.11	0.1
GHG			**CO2**	**CH4**	**N2O**	**CO2 Equiv**	
mT/yr			0.01	0.003	0.04	12	
Construction Years: CY 2013-2014; Assumed Full Occupancy: CY 2015							
P1218	236,795	21,312					
P1393	11,205	1,008					
Criteria Pollutants			**VOC**	**CO**	**NOx**	**SO_2**	**PM**
Tons/yr			1.0	9.5	5.2	2.3	1.1
GHG			**CO2**	**CH4**	**N2O**	**CO2 Equiv**	
mT/yr			6397	0.1	1	6653	

Construction Years: CY 2014-2015; Assumed Full Occupancy: CY 2016							
P1395	30,000	2,700					
CDC	22,370	2,013					
P1391	89,978	8,098					
P1362	39,288	3,536					
P1433	61,871	5,568					
Criteria Pollutants			**VOC**	**CO**	**NOx**	**SO_2**	**PM**
Tons/yr			1.0	9.3	5.1	2.2	1.1
GHG			**CO2**	**CH4**	**N2O**	**CO2 Equiv**	
mT/yr			6281	0.02	0.3	6376	
Construction Year: CY 2015; Assumed Full Occupancy: CY 2016							
P1396	39,568	3,561					
Criteria Pollutants			**VOC**	**CO**	**NOx**	**SO_2**	**PM**
Tons/yr			0.2	1.5	0.8	0.4	0.2
GHG			**CO2**	**CH4**	**N2O**	**CO2 Equiv**	
mT/yr			1021	0.01	0.1	1061	

Construction Years: CY 2016-2017; Assumed Full Occupancy: CY 2018							
P1219	236,795	21,312					
P1392	7,201	648					
P1394	63,000	5,670					
Criteria Pollutants			**VOC**	**CO**	**NOx**	**SO_2**	**PM**
Tons/yr			1.2	11.7	6.5	2.8	1.4
GHG			**CO2**	**CH4**	**N2O**	**CO2 Equiv**	
mT/yr			7918	0.1	1.0	8235	
Construction Years: CY 2017-2018; Assumed Full Occupancy: CY 2019							
P1410	5,920	533					
P1284	34,122	3,071					
P1411	25,004	2,250					
P1288	32,292	2,906					
Criteria Pollutants			**VOC**	**CO**	**NOx**	**SO_2**	**PM**
Tons/yr			0.4	3.7	2.1	0.9	0.4
GHG			**CO2**	**CH4**	**N2O**	**CO2 Equiv**	
mT/yr			2511	0	0	2611	

Boilers

Basic Information

Boiler Sizes	Varied based on facility square footage; see the sheet titled Facility Listing	
Oper. Hrs./yr	4,380	hrs/yr, assumed for each boiler
Fuel	Propane	
Fuel heating value	90,500	Btu/gal (AP-42 Section 1.5, for commercial-grade propane)
Typical sulfur content	15	grain/100 scf (commercial propane)

Emission Factors*

Criteria Pollutants	VOC	CO	NOx	SO_2	PM
lb/10^3 gal	1	7.5	13	1.50	0.7
GHG	**CO2**	**CH4**	**N2O**		
lb/10^3 gal	0.9	0.2	0.9		

* AP-42 Section 1.5

EMISSION ESTIMATES

Construction Year: 2012; Assumed Full Occupancy: CY 2013

Boiler Capacity, MMBtu/hr	0.3				
Project No.	P1440				
Criteria Pollutants	VOC	CO	NOx	SO_2	PM

tons/yr	0.01	0.05	0.09	0.01	0.005
GHG	**CO2**	**CH4**	**N2O**	**CO2 Equiv**	
mT/yr	0.01	0.001	0.01	1.9	

Construction Years: CY 2013-2014; Assumed Full Occupancy: CY 2015

Boiler Capacity, MMBtu/hr	5.9	0.3			
Project No.	P1218	P1393			
Criteria Pollutants	**VOC**	**CO**	**NOx**	**SO_2**	**PM**
tons/yr	0.15	1.13	1.95	0.23	0.11
GHG	**CO2**	**CH4**	**N2O**	**CO2 Equiv**	
mT/yr	0.12	0.03	0.12	39	

Construction Years: CY 2014-2015; Assumed Full Occupancy: CY 2016

Boiler Capacity, MMBtu/hr	0.8	0.6	2.2	1.0	1.5
Project No.	P1395	CDC	P1391	P1362	P1433
Criteria Pollutants	**VOC**	**CO**	**NOx**	**SO_2**	**PM**
tons/yr	0.15	1.10	1.92	0.22	0.10
GHG	**CO2**	**CH4**	**N2O**	**CO2 Equiv**	
mT/yr	0.12	0.03	0.12	38.05	

Construction Year: CY 2015; Assumed Full Occupancy: CY 2016

Boiler Capacity, MMBtu/hr	1.0				
Project No.	P1396				
Criteria Pollutants	**VOC**	**CO**	**NOx**	**SO_2**	**PM**
tons/yr	0.02	0.18	0.31	0.04	0.02
GHG	**CO2**	**CH4**	**N2O**	**CO2 Equiv**	
mT/yr	0.02	0.00	0.02	6.18	

Construction Years: CY 2016-2017; Assumed Full Occupancy: CY 2018

Boiler Capacity, MMBtu/hr	5.9	0.2	1.6		
Project No.	P1219	P1392	P1394		
Criteria Pollutants	**VOC**	**CO**	**NOx**	**SO_2**	**PM**
tons/yr	0.19	1.39	2.41	0.28	0.13
GHG	**CO2**	**CH4**	**N2O**	**CO2 Equiv**	
mT/yr	0.15	0.03	0.15	47.97	

Construction Years: CY 2017-2018; Assumed Full Occupancy: CY 2019

Boiler Capacity, MMBtu/hr	0.1	0.9	0.6	0.8	
Project No.	P1410	P1284	P1411	P1288	
Criteria Pollutants	**VOC**	**CO**	**NOx**	**SO_2**	**PM**
tons/yr	0.06	0.44	0.77	0.09	0.04
GHG	**CO2**	**CH4**	**N2O**	**CO2 Equiv**	
mT/yr	0.05	0.01	0.05	15.21	

Emergency Generators

Basic Information

EG Sizes	Varied based on facilities; see the sheet titled Facility Listing	
No. of Oper. Hours/yr (Assumed)	250	for emergency usage only
Fuel	Diesel Oil	

Emission Factors*

For Small EGs (up to 600 hp)

Criteria Pollutants (1)	VOC	CO	NOx	SO_2	PM
lb/hp-hr	0.002	0.005	0.023	0.002	0.002
GHG (2)	CO2	CH4	N2O		
lb/MMBtu	123	0.27	0.02		

For Large EGs (greater than 600 hp)

Criteria Pollutants (3)	VOC	CO	NOx	SO_2 (4)	PM
lb/hp-hr	0.0005	0.004	0.018	0.001	0.002
GHG (2)	CO2	CH4	N2O (5)		
lb/MMBtu	124	0.6	0.02		

(1) AP-42, Section 3.3; 75% loading applied for emission estimating purposes

(2) CO2 and CH4 emission factors from AP-42 Table 3.3-1; N2O EF from the 2004 API document titled Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Gas Industry, dated 2-2004

(3) AP-42, Section 3.4

(4) Assume 0.2 % sulfur

(5) See Note 2 above

EMISSION ESTIMATES

Construction Year: 2012; Assumed Full Occupancy: CY 2013

EG Energy, hp (small unit)	100				
Project No.	P1440				
Criteria Pollutants	**VOC**	**CO**	**NOx**	**SO_2**	**PM**
tons/yr	0.02	0.06	0.3	0.02	0.02
GHG	**CO2**	**CH4**	**N2O**	**CO2 Equiv**	
mT/yr	4	0.01	0.000	4	

Construction Years: CY 2013-2014; Assumed Full Occupancy: CY 2015

EG Energy, hp (large & small units)	1800	100.0			
Project No.	P1218	P1393			
Criteria Pollutants	**VOC**	**CO**	**NOx**	**SO_2**	**PM**
Large EGs - tons/yr	0.1	1	4.1	0	0
Small EG - tons/yr	0.0	0.1	0.3	0.0	0.0
GHG	**CO2**	**CH4**	**N2O**	**CO2 Equiv**	
Large EGs - mT/yr	64	0	0	74	
Small EG - mT/yr	4	0.01	0.000	4	

Construction Years: CY 2014-2015; Assumed Full Occupancy: CY 2016

EG Energy, hp (small units)	130.0	150	460	260	400
Project No.	P1395	CDC	P1391	P1362	P1433

Criteria Pollutants	VOC	CO	NOx	SO_2	PM
tons/yr	0.3	0.9	4	0.3	0.3
GHG	CO2	CH4	N2O	CO2 Equiv	
mT/yr	50	0	0.01	54	

Construction Year: CY 2015; Assumed Full Occupancy: CY 2016

EG Energy, hp (small units)	260				
Project No.	P1396				
Criteria Pollutants	VOC	CO	NOx	SO_2	PM
tons/yr	0.1	0.2	0.8	0.0	0.1
GHG	CO2	CH4	N2O	CO2 Equiv	
mT/yr	9	0.02	0.00	10	

Construction Years: CY 2016-2017; Assumed Full Occupancy: CY 2018

EG Energy, hp (large & small units)	1800.0	0.0	400		
Project No.	0	0			
Criteria Pollutants	VOC	CO	NOx	SO_2	PM
Large EGs - tons/yr	0.1	0.9	4	0.3	0.4
Small EG - tons/yr	0.1	0.3	1.2	0.1	0.1
GHG	CO2	CH4	N2O	CO2 Equiv	
Large EGs - mT/yr	64	0.3	0.01	74	
Small EG - mT/yr	14	0.03	0.00	15	

Construction Years: CY 2017-2018; Assumed Full Occupancy: CY 2019

EG Energy, hp (small units)	0.0	240	150	260	
Project No.	P1410	P1284	P1411	P1288	
Criteria Pollutants	**VOC**	**CO**	**NOx**	**SO_2**	**PM**
tons/yr	0.2	0.4	1.9	0.1	0.1
GHG	**CO2**	**CH4**	**N2O**	**CO2 Equiv**	
mT/yr	23	0.05	0.00	25	

APPENDIX D – MIGRATORY BIRD SPECIES

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Species, Status, Family	Habitat
HORNED GREBE (*Podiceps auritus*) Status: NAWCP Family: Podicipedidae	Breeds on small to moderate-sized, shallow freshwater ponds and marshes. Winters along coasts and on large bodies of water.
LEAST BITTERN (*Ixobrychus exilis)* Status: NAWCP Family: Ardeidae	Freshwater or brackish marshes with tall, dense emergent vegetation including sedges and cattails.
GT. BLUE HERON (*Ardea herodias*) Status: NAWCP Family: Areidae	Found along marshes, swamps, rivers, lake edges, tidal flats, mangroves, and seacoasts. Usually nests in trees near water, but colonies can be found away from water.
GREAT EGRET (*Ardea alba*) Status: NAWCP Family: Ardeidae	Nests in colonies with other species, in shrubs and trees over water, and on islands. Feeds in variety of wetlands, including marshes, swamps, streams, rivers, ponds, lakes, tide flats, seashores, canals, and flooded fields.
SNOWY EGRET (*Egretta thula*) Status: NCWRC-SC, NAWCP Family: Areidae	Coastal areas, marshes, river valleys, lake edges.
LITTLE BLUE HERON (*Egretta caerulea*) Status: NCWRC-SC, BCC, NAWCP Family: Areidae	Swamps, inland marshes, estuaries, rivers, ponds, lakes, and coastal areas.

Species, Status, Family	Habitat
TRICOLOR HERON (*Egretta tricolor*) Status: NCWRC-SC, NAWCP Family: Areidae	Marshes, shores, mudflats, and tidal creeks.
GREEN HERON (*Butorides virescens*) Status: NAWCP Family: Areidae	Breeds in swampy thickets. Forages in swamps, along creeks and streams, in marshes, ponds, lake edges, salt marshes, ponds and pastures. Winters mostly in coastal areas, especially mangrove swamps.
BLK-CRWN NGT-HER (*Nycticorax nycticorax*) Status: NAWCP Family: Areidae	Various wetland habitats, including salt, brackish, and freshwater marshes, swamps, streams, lakes, and agricultural fields.
WHITE IBIS (*Eudocimus albus*) Status: NAWCP Family: Threskiornithidae	Salt, brackish, and fresh marshes, rice fields, mangroves. May forage in any kind of shallow water, commonly flying to feed in fresh water even in coastal regions. Foraging sites include marshes, mudflats, flooded pastures, lake edges, mangrove lagoons, grassy fields. Nests in mangroves, trees in swamps, dense thickets, sometimes on ground on islands or in marshes.
CANADA GOOSE (*Branta canadensis*) Status: NAWMP, GBBDC Family: Anatidae	Breeds in a broad range of habitats from low Arctic tundra to prairies and parklands, including lakes, meadows, golf courses, and city parks.
WOOD DUCK (*Aix sponsa*) Status: GBBDC Family: Anatidae	Found in forested wetlands, including along rivers, swamps, marshes, ponds, and lakes.

Species, Status, Family	Habitat
AM. BLACK DUCK *(Anas rubripes)* Status: NAWMP, GBBDC Family: Anatidae	Breeds in a variety of wetland habitats, from salt marshes to beaver ponds, river islands, and boreal bogs. Winters primarily in salt water along coasts, but in a variety of freshwater areas inland.
MALLARD (*Anas platyrhynchos*) Status: NAWMP, GBBDC Family: Anatidae	Found in all wetland habitats, lakes, rivers, bays, and parks.
BLUE-WINGED TEAL (*Anas discors*) Status: NAWMP Family: Anatidae	Shallow ponds, small lakes and open grasslands, and seasonal and permanent wetlands ; winters on marshes and protected coastal areas.
NORTHERN PINTAIL (*Anas acuta*) Status: GBBDC, NAWMP Family: Anatidae	Nests in open country with shallow, seasonal wetlands or ponds and low vegetation. Winters in wide variety of shallow inland freshwater and intertidal habitats such as coastal bays, lakes, and agricultural fields.
AM. WIGEON (*Anas americana*) Status: GBBDC, NAWMP Family: Anatidae	Shallow freshwater wetlands, including ponds, lakes, marshes, and rivers. Winters on wet meadows, lakes, protected coastal waters.

Species, Status, Family	Habitat
RING-NECKED DUCK (*Aythya collaris*) Status: GBBDC Family: Anatidae	Summers on open lakes, marshes; winters on large lakes and coastal areas.
BLACK VULTURE (*Coragyps atratus*) Status: NCWRC-SC Family: Cathartidae	Open country, dumps, and urban areas.
BALD EAGLE (*Haliaeetus leucocephalus*) Status:MCIEAST-MCB CAMLEJ's INRMP-T, NCWRC-T Family: Accipitridae	Breeds in forested areas near large bodies of water. Winters in coastal areas, along large rivers, and large unfrozen lakes.
AM. SWAL. T. KITE (*Elanoides forficatus*) Status: BCC, PIF Family: Accipitridae	Forested regions near marshes or swamps, often bottomland, or riverine forest, also open pine woodland.
AMERICAN KESTREL (*Falco sparverius*) Status: BCC, PIF Family: Falconidae	Breeds in a variety of open habitats, including meadows, grasslands, deserts, parkland, agricultural fields, urban and suburban areas.
COOPERS HAWK (*Accipiter cooperii*) Status: NCWRC-SC Family: Accipitridae	Breeds in deciduous, mixed, coniferous forests and open woodland. Becoming more common in suburban and urban areas.
VIRGINA RAIL (*Rallus limicola*) Status: NAWCP Family: Rallidae	Freshwater marshes; occasionally inhabits salt marshes. Lives in dense emergent vegetation.

Species, Status, Family	Habitat
COMMON MOORHEN (*Gallinula chloropus*) Status: NAWCP Family: Rallidae	Freshwater or brackish marshes with tall emergent vegetation, ponds, canals, and rice fields.
SANDHILL CRANE (*Grus canadensis*) Status: NAWCP Family: Gruinae	Breeds in open marshes or bogs, and in wet grasslands and meadows. Feed in marshes and grain fields. Summers on praires and tundra; during winter, roosts on shallow water and feeds in agricultrual fields.
EASTERN KINGBIRD (*Tyrannus tyrannus*) Status: Family: Tyrannidae	Breeds in open environments with scattered perches, such as fields, orchards, shelterbelts, and forest edges. Uses urban parks and golf courses. Winters in river- and lake-edge habitats and canopy of tropical forests.
LOGGERHEAD SHRIKE (*Lanius ludovicianus*) Status: NCWRC-SC Family: Laniidae	Open country with some shrubs and trees.
FISH CROW (*Corvus ossifragus*) Status: Family: Corvidae	Primarily coastal, along beaches and marshes into forests. Usually near water, but breeds in urban areas and farmland away from coast and large bodies of water. Common at dumps and in urban areas.
BROWN-HD.NTHTCH (*Sitta pusilla*) Status: BCC, PIF Family: Sittidae	Pine forests, especially in open, mature forests with periodic fires.
BROWN CREEPER (*Certhia americana*) Status: NCWRC-SC Family: Certhiidae	Coniferous and mixed coniferous-deciduous forests.

Species, Status, Family	Habitat
WOOD THRUSH (*Hylocichla mustelina*) Status: BCC, PIF Family: Turdidae	Breeds in the interior and edges of deciduous and mixed forests, in rural to urban areas, generally in cool, moist sites, often near water.
NORTH. PARULA W. (*Parula americana*) Status: BCC, PIF Family: Parulidae	Deciduous and coniferous foressts, usually near water.
PRAIRIE WARBLER (*Dendroica discolor*) Status: BCC, PIF Family: Parulidae	Various shrubby habitats, including regenerating forests, dry brushy areas, open fields, old fields, young pine plantations, mangrove swamps, and Christmas-tree farms. Florida residents live in mangrove forests.
WORM-EATING WARB. (*Helmitheros vermivorum*) Status: PIF Family: Parulidae	Breeds in mature deciduous or mixed deciduous-coniferous forest with patches of dense understory, usually on steep hillside. Winters in tropical forests.
SWAINSON'S WARB. (*Limnothlypis swainsonii*) Status: BCC, PIF Family: Parulidae	Breeds in swamps and southern forests with thick undergrowth, especially canebrakes and floodplain forests in lowlands and rhododendron-mountain laurel in Appalachians. Winters in tropical scrub, evergreen, and gallery forests.
BLK-NECKED STILT (*Himantopus mexicanus*) Status: USSCP (Hawaiian population) Family: Recurvirostridae	Shallow fresh and saltwater wetlands, including salt ponds, rice fields, shallow lagoons, mangrove swamps, ditches, ponds salt ponds, or fields.
SOLITARY SAND. (*Tringa solitaria*) Status: USSCP Family: Scolopacidae	Breeds in taiga or boreal bogs, nesting in trees in deserted songbird nests. In migration and winter found along freshwater ponds, stream edges, temporary pools, flooded ditches and fields, more commonly in wooded regions, less frequently on mudflats and open marshes.
WHIMBREL (*Numenius phaeopus*) Status: BCC, USSCP Family: Scolopacidae	Breeds in various tundra habitat, from wet lowlands to dry heath. In migration, frequents various coastal and inland habitats, including fields and beaches. Winters in tidal flats and shorelines, occasionally visiting inland habitats.

Species, Status, Family	Habitat
RED KNOT (*Calidris canutus*) Status: BCC, USSCP Family: Scolopacidae	Breeds in drier tundra areas, such as sparsely vegetated hillsides. Outside of breeding season, it is found primarily in intertidal, marine habitats, especially near coastal inlets, estuaries, and bays.
WHT-RUMP. SAND. (*Calidris fuscicollis*) Status: Family: Scolopacidae	Breeds in mossy or grassy tundra near water. On migration and during winter found in grassy marshes, mudflats, sandy beaches, flooded fields, and shores of ponds and lakes.
DUNLIN (*Calidris alpina*) Status: USSCP (Alaska-East Asian and Alaska-Pacific Coast populations) Family: Scolopacidae	Breeds in wet coastal tundra. Winters along mudflats, estuaries, marshes, flooded fields, sandy beaches, and shores of lakes and ponds.
STILT SAND. *(Calidris himantopus)* Status: BCC Family: Scolopacidae	Breeds in sedge tundra near water, often near wooded borders of the taiga. On migration and in winter found along mudflats, flooded fields, shallow ponds and pools, and marshes.
S-BILL.DOWITCHER (*Limnodromus griseus*) Status: BCC, USSCP Family: Scolopacidae	Breeds in muskegs of taiga to timberline and on bogs at northern limit of coniferous forests, and barely onto subarctic tundra. Winters on coastal mud flats and brackish lagoons. In migration prefers saltwater tidal flats, beaches, and salt marshes. Found in freshwater mud flats and flooded agricultural fields.
AM. WOODCOCK (*Scolopax minor*) Status: USSCP, GBBDC Family: Scolopacidae	Forests and thickets with openings, shrubby areas, meadows.
LAUGHING GULL (*Larus atricilla*) Status: NAWCP Family: Laridae	Nests in marshes, on beaches, and on islands along coast. Found along coasts, in estuaries, bays, and inland lakes. Feeds along the ocean, on rivers, at landfills, and in urban parks.

Species, Status, Family	Habitat
RING-BILLED GULL (*Larus delawarensis*) Status: NAWCP Family: Laridae	Nests on islands. Found around fresh water, landfills, golf courses, farm fields, shopping areas, and coastal beaches.
HERRING GULL (*Larus argentatus*) Status: NAWCP Family: Laridae	Breeds on islands. Forages and winters at sea, along beaches and mudflats, lakes, rivers, fields, at dumps, and other areas where human-produced food is available. Rests in open areas, including parking lots, fields, and airports.
LEAST TERN (*Sterna antillarum*) Status: NCWRC-SC, E, BCC, NAWCP Family: Laridae	Seacoasts, beaches, bays, estuaries, lagoons, lakes and rivers, breeding on sandy or gravelly beaches and banks of rivers or lakes, rarely on flat rooftops of buildings.
BLACK TERN (*Chlidonias niger*) Status: BCC, NAWCP Family: Laridae	Summers on wet meadows, marshes, ponds; winters on coast and at sea.
CHUK-WIL'S-WIDOW (*Caprimulgus carolinensis*) Status: BCC Family: Caprimulgidae	Along edges of coniferous or mixed forests; often along rivers.
RED-COCKAD.WOOD (*Picoides borealis*) Status: NCWRC-E, PIF Family: Picidae	Open pine forest maintained by frequent fires, especially longleaf pine forests.
YEL-BELL. SAPSUCKER (*Sphyrapicus varius*) Status: NCWRC-SC, FSC Family: Picidae	Breeds in young forests and along streams, especially in aspen and birch; also in orchards. Winters in variety of forests, especially semiopen woods.

Species, Status, Family	Habitat
HOODED WARBLER (*Wilsonia citrina*) Status: PIF Family: Parulidae	Dense shrubbery in mature deciduous woodlands, especially near streams.
PAINTED BUNTING (*Passerina ciris*) Status: BCC, PIF Family: Cardinalidae	Open brushlands, thickets, and scattered woodlands. Along Atlantic coast, also in hedges and yards.
BACHMAN'S SPAR. (*Aimophila aestivalis*) Status: NCWRC--SC and FSC; BCC, PIF Family: Emberizidae	Open pine or oak woods, brushy fields. Found primarily in open pine woods with understory of wiregrass, palmettos, and weeds, and in oak-palmetto scrub, grasslands.
SLTMRSH SHARP-TAIL SPAR. (*Ammodramus caudacutus*) Status: BCC Family: Emberizidae	Salt and fresh-water marshes, wet meadows, lakeshores.
NELSON'S SHARP-TAIL SPAR. (*Ammodramus nelsoni)* Status: BCC Family: Emberizidae	Freshwater marshes, lakeshores, and wet meadows in interior and brackish marshes along coast; in winter in salt and brackish marshes.
SWAMP SPARROW (*Melospiza georgiana*) Status: Family: Emberizidae	Various wetlands, including freshwater and tidal marshes, bogs, meadows, and swamps. Winters also in damp fields with tall grass.
ORCHARD ORIOLE (*Icterus spurius*) Status: BCC Family: Icteridae	Nests in gardens, orchards, open woods, wetlands, suburban areas, parks, along streams and lakes, and in large planted trees near houses. In winter found in tropical forests.