FINAL

ENVIRONMENTAL ASSESSMENT

For

Construction of Fire Stations

At

Marine Corps Air Station Cherry Point, North Carolina

May 2020

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Abstract

Designation:	Environmental Assessment
Title of Proposed Action:	Construction of Fire Stations
Project Location:	Marine Corps Air Station Cherry Point
Lead Agency for the EA:	U.S. Marine Corps
Cooperating Agency:	None
Affected Region:	Craven County, North Carolina
Action Proponent:	Marine Corps Air Station Cherry Point
Point of Contact:	Marine Corps Air Station, Cherry Point Environmental Affairs Department Jessica Guilianelli PSC Box 8006 Cherry Point, North Carolina 28533 jessica.guilianelli@usmc.mil
Date:	May 2020

Marine Corps Air Station Cherry Point has prepared this Environmental Assessment in accordance with the National Environmental Policy Act, as implemented by the Council on Environmental Quality Regulations and U.S. Marine Corps regulations for implementing the National Environmental Policy Act. The Proposed Action is to replace two aging fire stations on base at Marine Corps Air Station Cherry Point in Craven County, North Carolina. This Environmental Assessment evaluates the potential environmental impacts associated with the Proposed Action and the No Action Alternative to the following resource areas: air quality, cultural resources, biological resources, visual resources and recreation, noise, infrastructure, traffic and transportation, and public health and safety. Project implementation is scheduled for Fiscal Year 2022.

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EXECUTIVE SUMMARY

ES.1 Proposed Action

Marine Corps Air Station (MCAS) Cherry Point has prepared this Environmental Assessment (EA) to assess the potential environmental impacts associated with replacing two aging fire stations with two new modern fire stations in Craven County, North Carolina. The two existing fire stations are not optimally located to serve all the areas of the air station and are not large enough to accommodate the personnel, vehicles and equipment. Once new facilities are constructed, the existing fire stations (buildings 192, 193, and 4203) would be demolished.

ES.2 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to provide fire station facilities that offer adequate response times to all areas of MCAS Cherry Point, safe and healthy living environments for personnel who occupy the facilities, and proper storage for vehicles and equipment. The need for the proposed action is to comply with the requirements of the Marine Corps Fire Protection and Emergency Services Program (Marine Corps Order [MCO] 11000.11A); Unified Facilities Criteria (UFC) 2-000-05N Facility Planning Criteria For Navy/Marine Corps Shore Installations (formerly Naval Facilities Engineering Command [NAVFAC] P-80); U.S. Army Corps of Engineers (USACE) Standard Fire Station Design Manual (UFC 4-730-10); and Department of Defense (DoD) Manual 6055.06, *Fire and Emergency Services Certification Program* and DoD Instruction (DoDI) 6055.06, *DoD Fire and Emergency Services Program*.

ES.3 Alternatives Considered

MCAS Cherry Point is considering one action alternative that meets the purpose of and need for the Proposed Action and a No Action Alternative.

The proposed action would replace the Main and Satellite Fire Stations on MCAS Cherry Point. Once new facilities are constructed, buildings 192, 193, and 4203 would be demolished.

Alternatives were developed for analysis based upon the following screening factors: ability to comply with the requirements of Marine Corps Fire Protection and Emergency Services Program (MCO 11000.11A); Unified Facilities Criteria (UFC) 2-000-05N Facility Planning Criteria for Navy/Marine Corps Shore Installations (formerly NAVFAC P-80); U.S. Army Corps of Engineers (USACE) Standard Fire Station Design Manual (UFC 4-730-10); DoD Manual 6055.06; and DoDI 6055.06. In addition, locations considered for the proposed main and Satellite Stations were evaluated against the following geographic considerations: whether it is large enough to accommodate modern facilities and if the location could meet response time requirements to all areas of responsibility on the air station.

Based on the screening factors and meeting the requirements of the purpose and need three candidate sites were identified as meeting all of the screening factors and analyzed within this EA (**Figure ES-1**). The location under consideration for the Main Station is located on a cleared site and paved parking lot, near existing barracks and basketball courts, to the east of Roosevelt Blvd. Two locations are being considered for the Satellite Station: Site 1 is a cleared site, currently used for storage of mowing and landscaping equipment; and Site 2 is further south to the east of Roosevelt Blvd on a wooded site adjacent to a power line right of way.

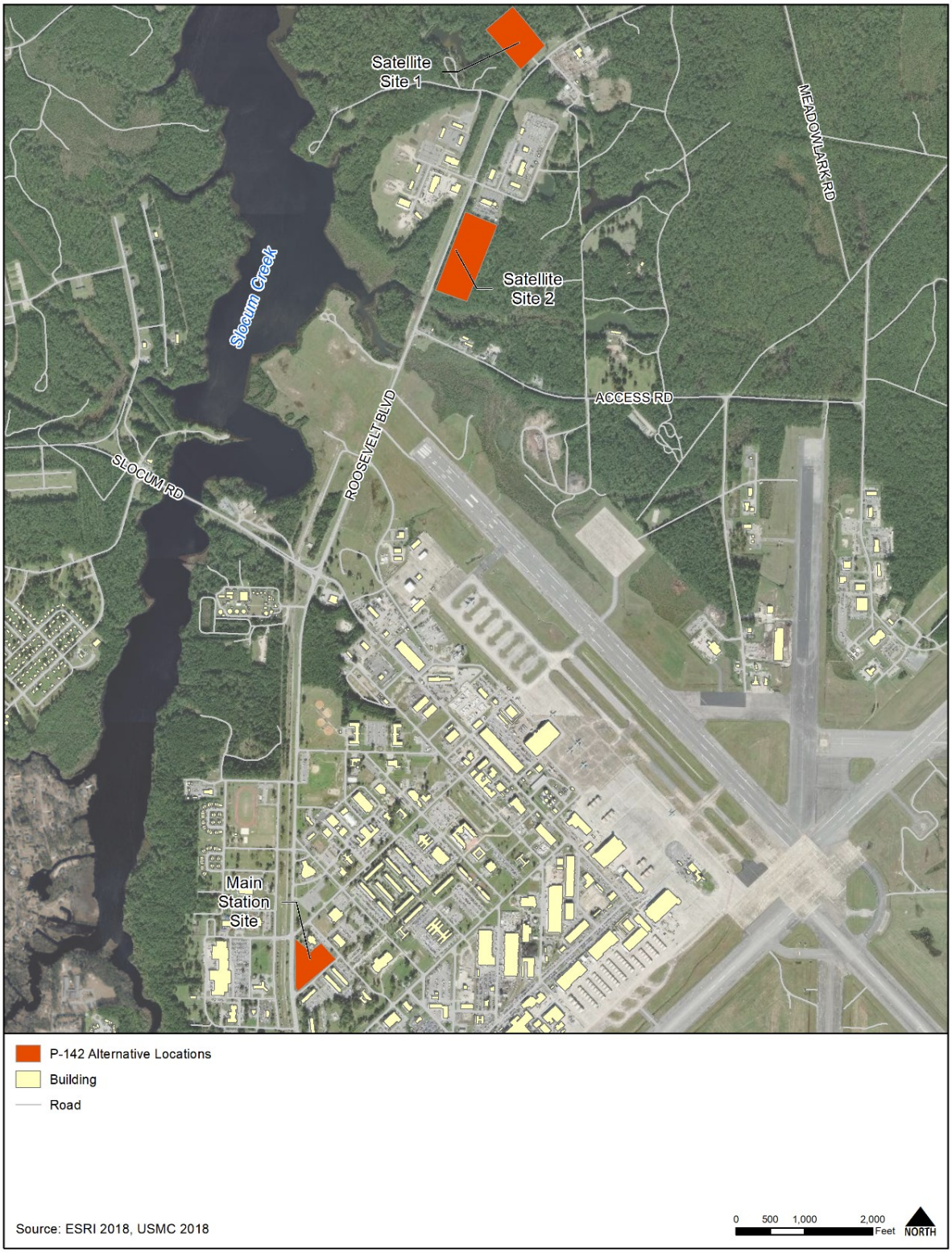

Figure ES-1. Proposed Locations of Main and Satellite Fire Stations

Under the No Action Alternative, the Proposed Action would not occur; the Marine Corps would not establish new fire station facilities. While the No Action Alternative would not meet the purpose of and need for the Proposed Action, it is required by the National Environmental Policy Act (NEPA) to provide a baseline for measuring the environmental consequences of the action alternatives.

ES.4 Summary of Environmental Resources Evaluated in the EA

Council on Environmental Quality (CEQ) regulations, NEPA, and Navy and U.S. Marine Corps instructions for implementing NEPA, specify that an EA should address those resource areas potentially subject to impacts. The following resource areas have been addressed in this EA: air quality, cultural resources, biological resources, visual resources and recreation, noise, infrastructure, traffic and transportation, and public health and safety. Because potential impacts were considered to be negligible or non-existent, the following resource areas were not evaluated in this EA: airspace, hazardous materials and wastes, socioeconomics and environmental justice, land use and coastal zone, water resources, and geological resources.

ES.5 Summary of Potential Environmental Consequences of the Action Alternatives and Major Mitigating Actions

Table ES-1 provides a tabular summary of the potential impacts to the resources associated with the Proposed Action.

Table ES-1. Summary of Potential Impacts to Resource Areas

Resource Area	No Action Alternative	Fire Station Construction and Demolition (Preferred Alternative)
Air Quality	The No Action Alternative would have no significant impacts to air quality.	• The emissions associated with construction and demolition would be temporary and localized. • Estimated emissions would not exceed any of the comparative thresholds. • The emissions would contribute directly to emission of GHGs from combustion of fossil fuels.
Cultural Resources	The No Action Alternative would have no significant impacts to cultural resources.	• No archaeological resources would be impacted by the proposed demolition of the existing Main or Satellite Stations, nor the construction of the Main Station or Satellite Station at Site 1. The proposed Satellite Station Site 2 has not been previously surveyed or disturbed. If this site is selected MCAS Cherry Point would determine the presence of National Register of Historic Places eligible archaeological resources through consultation with the North Carolina SHPO and complete appropriate archaeological investigations • No architectural resources are considered eligible for listing in the NRHP at the existing Main or Satellite Station Sites or the proposed Main or Satellite Station Sites 1 or 2 or at the Main Station Site. • No known traditional cultural properties have been identified at MCAS Cherry Point.
Biological Resources	The No Action Alternative would have no significant impacts to biological resources.	• The proposed demolition of the existing Main and Satellite Fire Stations is not expected to affect natural vegetation or wildlife. • The proposed construction of the Main Fire Station would occur in a previously disturbed area that supports no native vegetation or wildlife. • The proposed construction of the Satellite Station at either Site 1 or 2 would remove small areas of natural vegetation. The impacts to wildlife would be minimal.
Visual Resources and Recreation	The No Action Alternative would have no significant impacts to visual resources and recreation.	• The proposed Main and Satellite Stations would have similar design and character as the rest of the cantonment area and there would be no impact to visual resources. • The existing basketball courts at the proposed site for the Main Station would be removed; however, there would be no significant impact to recreation activities at the installation.
Noise	The No Action Alternative would have no significant impacts to the noise environment.	• Under the Proposed Action, there would be short-term and temporary noise generated by construction and demolition equipment and activities. • The predominate noise source at MCAS Cherry Point is from aircraft operations and it is expected that the temporary construction noise would not be perceptible.
Infrastructure	The No Action Alternative would have no significant impacts to infrastructure.	• Construction and demolition, under the Proposed Action, would have only minor impacts to the infrastructure and utilities at MCAS Cherry Point. • While these facilities would introduce new connections for potable water, wastewater, and power, the size of the facilities and required demand from these utilities would not create capacity concerns.

Table ES-1. Summary of Potential Impacts to Resource Areas

Resource Area	No Action Alternative	Fire Station Construction and Demolition (Preferred Alternative)
		• During construction, the contractor would be required to follow stormwater best management practices (BMPs), a Stormwater Pollution Prevention Plan and a site-specific erosion and sediment control plan. • The new fire stations are not anticipated to generate an inordinate quantity of solid waste. Debris from the demolition process will be taken to an approved construction and demolition debris land fill in accordance with required laws and regulations.
Traffic and Transportation	The No Action Alternative would have no significant impacts to traffic and transportation.	• During construction, vehicles and equipment would cause minor disturbances to traffic flow. • The disturbance to traffic flow would be greater at the proposed Main Station site given its location near the main portion of MCAS Cherry Point.
Public Health and Safety	The No Action Alternative would have no significant impacts to public health and safety.	• During construction at the Proposed Action sites, Occupational Safety and Health Act regulations, procedures, and anti-terrorism/force protection requirements would be followed; therefore, no significant impacts to public health or safety are anticipated. • There are no environmental health or safety risks associated with the Proposed Action that would disproportionately affect children.

ES.6 Public Involvement

Regulations from CEQ direct agencies to involve the public in preparing and implementing their NEPA procedures. For this project, which will affect lands within the boundaries of the air station, the Draft EA was published and the Final EA and FONSI will be published to the NAVFAC website: https://www.navfac.navy.mil/navfac_worldwide/atlantic/fecs/mid-atlantic/about_us/environmental_norfolk/environmental_planning_and_conservation.html. Notices of availability are published in the New Bern Sun Journal.

The public comment period on the Draft EA ended on April 28, 2020. No comments were received. For additional information please contact Jessica Guilianelli at Marine Corps Air Station Cherry Point Environmental Affairs Department, PSC Box 8006, Cherry Point, North Carolina 28533; or email: jessica.guilianelli@usmc.mil .

Final
Environmental Assessment for Construction of Fire Station at Marine Corps Air Station Cherry Point, North Carolina

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Abbreviations and Acronyms

Acronym	Definition
APE	Area of Potential Effect
AT/FP	Antiterrorism Force Protection
BMP	best management practice
BEQ	Bachelor Enlisted Quarters
CAA	Clean Air Act
CDC	Child Development Center
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
dB	decibel
dBA	A-weighted sound level
DNL	day-night average sound level
DoD	United States Department of Defense
DoDI	Department of Defense Instruction
DON	United States Department of the Navy
EA	Environmental Assessment
ECP	entry control point
EIS	Environmental Impact Statement
EO	Executive Order
FY	fiscal year
GHG	greenhouse gas
GPD	gallons per day
HAP	hazardous air pollutant
HVAC	heating, ventilation, and air conditioning
Hz	Hertz
ICRMP	Integrated Cultural Resources Management Plan
IWTP	Industrial water treatment plant
LOS	level of service
MBTA	Migratory Bird Treaty Act
MCAS	Marine Corps Air Station
MCO	Marine Corps Order
MGD	million gallons per day
MSAT	Mobile Source Air Toxics
MT/yr	Metric tons/year
NAAQS	National Ambient Air Quality Standards
NAVFAC	Naval Facilities Engineering Command
NCDCR	North Carolina Department of Cultural Resources
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NO_x	nitrogen oxide
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
OSHA	Occupational Health and Safety Administration
Pb	lead
PM_{10}	particulate matter less than or equal to 10 microns in diameter
$PM_{2.5}$	particulate matter less than or equal to 2.5 microns in diameter
PSD	Prevention of Significant Deterioration
ROI	region of influence
SCBA	self-contained breathing apparatus
SF	square feet
SHPO	State Historic Preservation Officer
SO_2	sulfur dioxide
Tpy	tons per year
UFC	Unified Facilities Code

Acronym	Definition
U.S.	United States
U.S.C.	United States Code
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VOC	volatile organic compounds
WWTP	wastewater treatment plant

1 Purpose of and Need for the Proposed Action

1.1 Introduction

The Marine Corps Air Station (MCAS) Cherry Point proposes to replace two aging fire stations on base in Craven County, North Carolina. This Environmental Assessment (EA) has been prepared in accordance with the requirements of the National Environmental Policy Act (NEPA) (42 United States [U.S.] Code [U.S.C.] section 4321 et seq.); the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] section 1500 et seq.); Marine Corps Order (MCO) 5090.2, Volume 12; U.S. Marine Corps NEPA Manual 2.0 (2011); and all other applicable laws, regulations, Executive Orders (EOs), and instructions.

1.2 Background

The MCAS Cherry Point Fire Department functions as an all-hazards fire and emergency service organization with responsibilities including not only fire protection but also emergency medical services, confined space rescue, water rescue, open water spill response, high angle rescue, hazardous material & weapons of mass destruction mitigation, trench rescue, structural collapse, wildland firefighting, aircraft firefighting, fire inspection, public education, and risk management. These responsibilities require specialized equipment that needs to be transported and housed.

Two existing fire stations on MCAS Cherry Point are not optimally located to serve all areas of the air station within the required response times. The existing main station, building 193 (and its adjacent storage building 4203), is located on F Street in the center of the station's core area. The existing Satellite Station, building 192, is located north of the core area, on Roosevelt Blvd near the officers' housing area. Additionally the stations are aging, both were built in 1944, and do not meet current Department of Defense (DoD) and Marine Corps standards or support current mission requirements.

Current response time guidelines depend on the nature of the emergency (fire or medical) and number of personnel required (DoDI 6055.06, Section 7). For example, guidelines stipulate that for 90 percent of calls for most types of emergency (including fire, medical response, technical rescue and hazmat response) the first unit arrive on scene within 7 minutes. MCAS Cherry Point is divided into two Fire Demand Zones, divided roughly along a line extending from the end of runway 14, across Roosevelt Blvd (see **Figure 1.2-1**). The Satellite Station serves the northern zone and the main station serves the southern zone (Salter personal communication 2019).

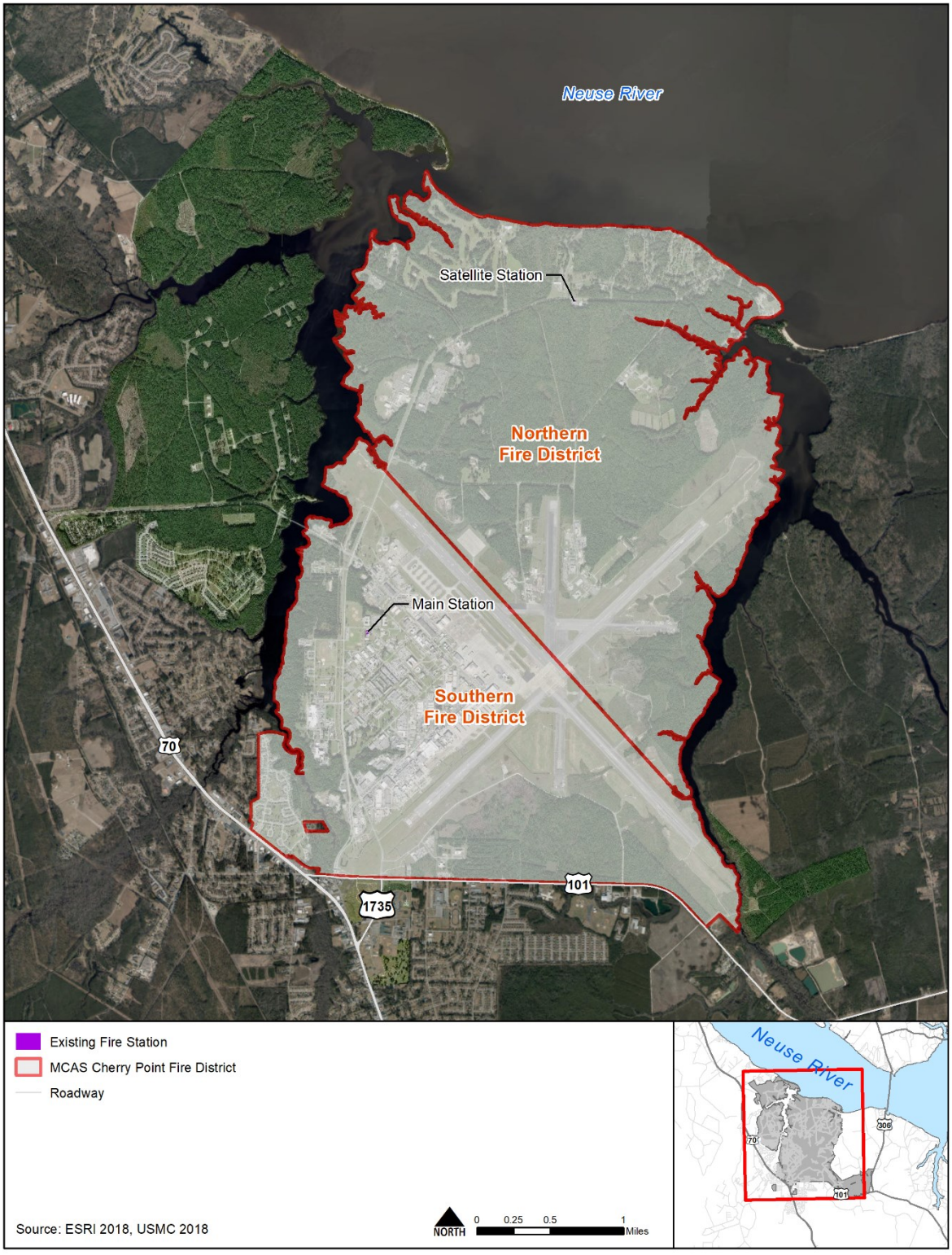

Figure 1.2-1. MCAS Cherry Point Fire Demand Zones

The existing fire stations are not large enough to accommodate the personnel, vehicles, and equipment. Living conditions for crews including bunkrooms, kitchens, and restroom facilities are insufficient. Some vehicles are stored outside. Freezing conditions can damage equipment, cause ice buildup on vehicles, and can necessitate draining water tanks and pumps. This can result in longer response time and can impact crew safety. Each station has an adjacent storage building (buildings 4343 and 4562) used to store response gear and equipment. These storage buildings are not climate controlled. Temperature extremes in storage buildings are damaging to equipment such as regulators and foam systems that are critical for the first responder operations. Exposure to extreme temperatures can also damage mechanical equipment, cause diesel fuel thickening, result in difficulty starting engines, and necessitate the winterizing of tools inhibiting response efficiency and reducing equipment lifespans.

In 2018, Hurricanes Florence and Michael exacerbated ongoing issues with aging infrastructure at the main and Satellite Stations. Roofs and walls sustained dozens of leaks leading to mold and mildew on insulation, drywall, and carpets. Saturated conditions lead to septic system backups flooding bathrooms. Vehicles not housed in garages were damaged or were stored offsite (See **Figures 1.2-2** and **Figure 1.2-3**).

Figure 1.2-2. Existing Main Fire Station at MCAS Chery Point

Figure 1.2-3. Existing Satellite Fire Station at MCAS Cherry Point

The proposed action would replace these inadequate and aging fire stations with two new modern fire stations, which would be better located to respond as required to areas of the air station and would be adequately sized to house equipment and personnel.

The on-base housing area is served and would continue to be by the existing Fire and Emergency Medical Services station (building 4875) and base housing outside the gate would continue to be served by Havelock Fire Department.

1.3 Location

MCAS Cherry Point is located on approximately 13,164 acres in Craven County, in the City of Havelock, North Carolina. (**Figure 1.3-1**).

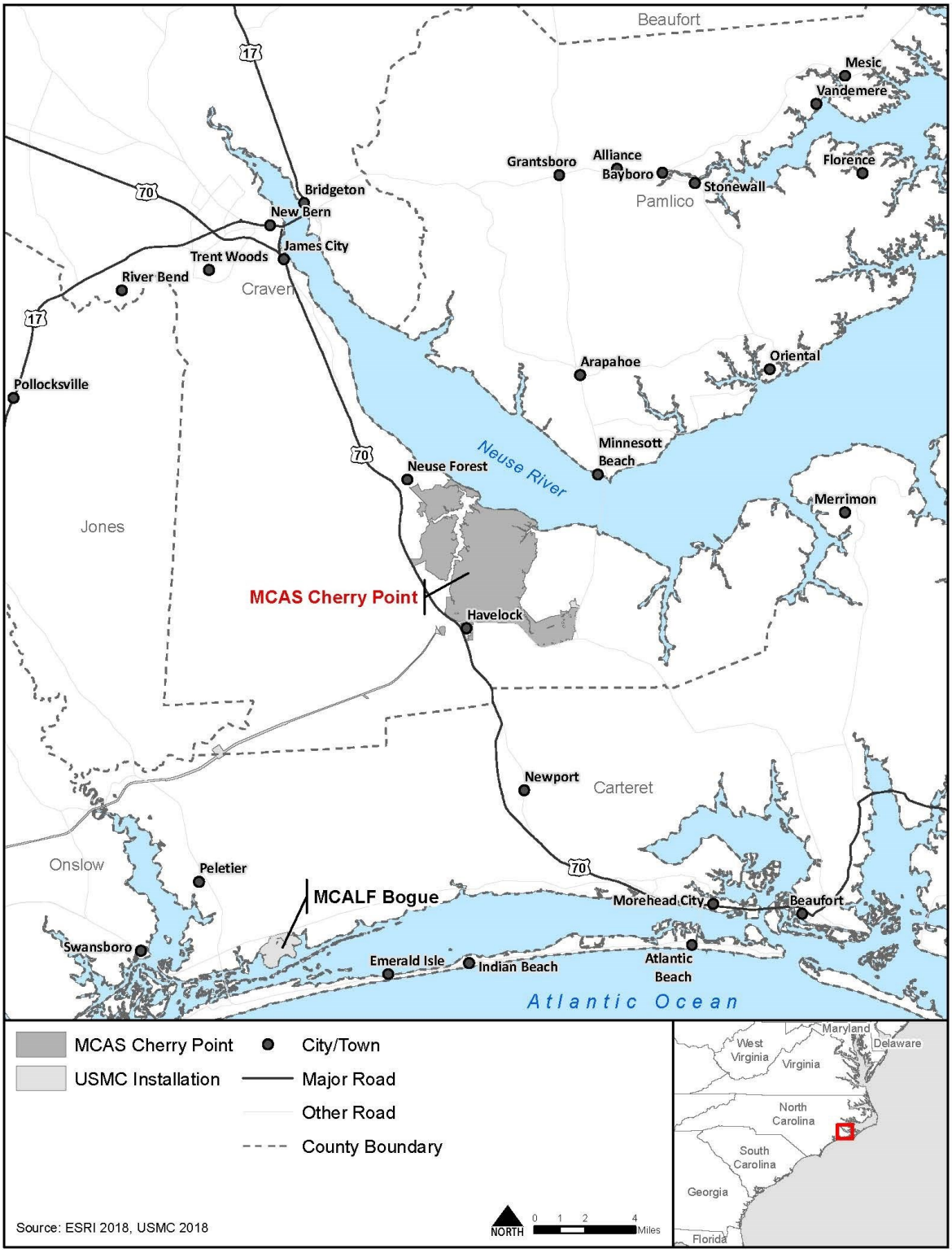

Figure 1.3-1. MCAS Cherry Point

1.4 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to provide fire station facilities that provide adequate response times to all areas of MCAS Cherry Point, safe and healthy living environment for personnel who occupy the facilities, and proper storage for vehicles and equipment.

> 10 U.S.C. section 5063: The Marine Corps shall be organized, trained, and equipped to provide fleet marine forces of combined arms, together with supporting air components, for service with the fleet in the seizure or defense of advanced naval bases and for the conduct of such land operations as may be essential to the prosecution of a naval campaign.

The need for the proposed action is to comply with the requirements of the Marine Corps Fire Protection and Emergency Services Program (MCO 11000.11A); Unified Facilities Criteria (UFC) 2-000-05N Facility Planning Criteria For Navy/Marine Corps Shore Installations (formerly Naval Facilities Engineering Command [NAVFAC] P-80); U.S. Army Corps of Engineers (USACE) Standard Fire Station Design Manual (UFC 4-730-10); DoD Fire and Emergency Services Certification Program (DoD 6055.6-M); and DoDI 6055.06, DoD Fire and Emergency Services Program.

The Proposed Action furthers the U.S. Marine Corps' execution of its congressionally mandated roles and responsibilities under 10 U.S.C. section 5063.

1.5 Scope of Environmental Analysis

This EA includes an analysis of potential environmental impacts associated with the action alternatives and the No Action Alternative. The environmental resource areas analyzed in this EA include: air quality, cultural resources, biological resources, visual resources and recreation, noise, infrastructure, traffic and transportation, and public health and safety. The study area for each resource analyzed may differ due to how the Proposed Action interacts with or impacts the resource. For instance the study area for land use resources may only include the construction footprint of a building whereas the noise study area would expand out to include areas that may be impacted by operational, range, or construction noise.

1.6 Key Documents

Key documents are sources of information incorporated into this EA. Documents are considered to be key because of similar actions, analyses, or impacts that may apply to this Proposed Action. CEQ guidance encourages incorporating documents by reference. Documents incorporated by reference in part or in whole include:

- MCO 11000.11A, Marine Corps Fire Protection and Emergency Services Program
- U.S. Army Corps of Engineers Standard Fire Station Design Manual (UFC 4-730-10)
- UFC 2-000-05N Facility Planning Criteria For Navy/Marine Corps Shore Installations (formerly NAVFAC P-80)
- DoD Manual 6055, Fire and Emergency Services Certification Program
- DoDI 6055-06, Fire and Emergency Services Certification Program
- Form 1391, Fiscal Year (FY)22 Military Construction Program, Fire Stations (Project Number P142)
- MCAS Cherry Point Transportation Component Report of Master Plan, 2013

- MCAS Cherry Point Master Plan, 2014
- MCAS Cherry Point Integrated Natural Resources Management Plan, 2012
- MCAS Cherry Point Integrated Cultural Resources Management Plan, 2018
- MCAS Cherry Point Draft Area Traffic Accommodation Plan, 2019
- Pre-Final Fleet Readiness Center East Area Development Plan, 2019
- Revised Draft Report Architectural Survey Update, MCAS Cherry Point, North Carolina, 2019
- Letter from David Brook, Deputy State Historic Preservation Officer, North Carolina Department of Cultural Resources to Charles W. Walker, PE, Head, Environmental Planning Branch, Department of the Navy, Naval Facilities Engineering Command, June 1998

1.7 Relevant Laws and Regulations

This EA has been prepared in accordance with federal and state laws, statutes, regulations, and policies pertinent to the implementation of the Proposed Action, including the following:

- NEPA (42 U.S.C. sections 4321–4370h)
- CEQ Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1500–1508)
- Department of Navy (DoN) Regulations for implementing NEPA (32 CFR 775)
- MCO 5090.2, Volume 12, Environmental Planning and Review
- Clean Air Act (CAA; 42 U.S.C. section 7401 et seq.)
- Clean Water Act (33 U.S.C. section 1251 et seq.)
- Coastal Zone Management Act (16 U.S.C. section 1451 et seq.)
- National Historic Preservation Act (NHPA; 54 U.S.C. section 306108 et seq.)
- Endangered Species Act (16 U.S.C. section 1531 et seq.)
- Migratory Bird Treaty Act (MBTA; 16 U.S.C. sections 703–712)
- EO 11988, Floodplain Management
- EO 13834, Efficient Federal Operations
- EO 13186, Responsibility of Federal Agencies to Protect Migratory Birds
- EO 13045, Protection of Children from Environmental Health Risks and Safety Risks

A description of the Proposed Action's consistency with these laws, policies and regulations, as well as the names of regulatory agencies responsible for their implementation, is presented in Chapter 5 (**Table 5.1-1**).

1.8 Public and Agency Involvement and Intergovernmental Coordination

Regulations from CEQ direct agencies to involve the public in preparing and implementing their NEPA procedures. For this project, which will affect lands within the boundaries of the air station, the Draft EA was published and the Final EA and FONSI will be published to the NAVFAC website: https://www.navfac.navy.mil/navfac_worldwide/atlantic/fecs/mid-atlantic/about_us/environmental_norfolk/environmental_planning_and_conservation.html. Notices of availability were published in the New Bern Sun Journal. The public comment period on the Draft EA ended on April 28, 2020. No comments were received. For additional information please contact Jessica Guilianelli at Marine Corps Air Station Cherry Point Environmental Affairs Department, PSC Box 8006, Cherry Point, North Carolina 28533; or email: jessica.guilianelli@usmc.mil .

2 Proposed Action and Alternatives

2.1 Proposed Action

The proposed action would replace the Main and Satellite Fire Stations on MCAS Cherry Point. Once new facilities are constructed, buildings 192, 193, and 4203 would be demolished.

2.2 Screening Factors

NEPA's implementing regulations provide guidance on the consideration of alternatives to a federally proposed action and require rigorous exploration and objective evaluation of reasonable alternatives. Only those alternatives determined to be reasonable and to meet the purpose and need require detailed analysis.

Potential alternatives that meet the purpose and need were required to comply with:

- MCO 11000.11A, Marine Corps Fire Protection and Emergency Services Program;
- USACE Standard Fire Station Design Manual, UFC 4-730-10;
- UFC 2-000-05N Facility Planning Criteria for Navy/Marine Corps Shore Installations; and
- DoD Manual 6055.06, Fire and Emergency Services Certification Program; and
- DoDI 6055.06, DoD Fire and Emergency Services Program.

Locations considered for the proposed Main and Satellite Stations were evaluated against the following screening factors:

1. large enough to accommodate modern facilities; and,
2. located to meet response time requirements to all areas of responsibility on the air station.

2.3 Alternative Carried Forward for Analysis

Based on the reasonable alternative screening factors and meeting the purpose and need for the Proposed Action, several alternative locations for the construction of a Main and Satellite Fire Station will be analyzed in this EA.

2.3.1 No Action Alternative

The No Action Alternative would not meet the purpose and need as described in Section 1.4, and, therefore, is not considered a reasonable alternative. However, CEQ guidelines stipulate that the No Action Alternative must be analyzed to assess any environmental consequences that may occur if the proposed action is not implemented. Therefore, this alternative was carried forward for analysis and will serve to establish a comparative baseline for analysis.

2.3.2 Fire Station Construction and Demolition (Preferred Alternative)

2.3.2.1 Construction

While designs of the proposed facilities are not yet completed, they would be designed to meet or exceed the useful service life specified in DoD UFC and would incorporate features that provide the

lowest practical life cycle cost solutions satisfying the facility requirements with the goal of maximizing energy efficiency. Site preparation work would include necessary clearing and earthwork.

Both fire stations would be single-story buildings with concrete foundations, masonry walls, and metal roofing. The Main and Satellite Fire Stations would be multi-bay drive-thru facilities. The main station would be approximately 32,092 square feet (SF) and the Satellite Fire Station would be approximately 12,698 SF. Each station would feature a fire hose drying rack, storage room, dayroom, training area, dining room, kitchen, exercise room, medical supply storage area, boat storage, administrative space, dispatch center, workroom, laundry, fire extinguisher maintenance room, self-contained breathing apparatus (SCBA) room, toilets and shower rooms for males and females, and individual sleeping quarters with personnel lockers. Paving and site improvements would include landscaping, access roadways, erosion and sediment control, parking lots, pads for equipment, retention basins, and sidewalks. Roadway work could include intersection improvements, traffic signal lights and controls, and signage.

Built-in equipment would include compressed air systems for vehicle maintenance, gear lockers, overhead vehicle doors, equipment racks, raised flooring, fire pumps, vehicle bay radiant heating, grease traps, overhead hose reels, gear washer/dryer/extractors, cascade systems for SCBA room testing, public address systems, built-in work benches, vehicle exhaust systems, and emergency generators. Berthing area built-in equipment would include commercial kitchen hoods, stove/ovens, dishwashers, refrigerator/freezers, ice makers, and ceiling fans.

Supporting utilities would include natural gas, electrical, steam, water, sanitary and storm sewer, telephone, local area network, and cable television. Within buildings, services would include heating, ventilation, and air conditioning (HVAC), fire protection systems, fire alarm systems, electrical cables and conductors, electrical vaults, lightning protection, transformers, and traffic signal controls. Additionally, new roadway entry points and potentially emergency signalization of these entry points may be required to allow access to the roadway network.

This project would comply with Antiterrorism Force Protection (AT/FP) regulations, and physical security mitigation in accordance with DoD Minimum Anti-Terrorism Standards for Buildings. DoD and Department of the Navy principles for high performance and sustainable building requirements would be included in the design and construction of the project in accordance with federal laws and Executive Orders. Low Impact Development would be included in the design and construction of this project as appropriate.

Several alternative locations are being considered for the new stations (**Figure 2.3-1**). The location under consideration for the Main Station is located on a cleared site and paved parking lot, near existing barracks and basketball courts, to the east of Roosevelt Blvd (**Figure 2.3-2**). Two locations are being considered for the Satellite Station: Site 1 (Preferred Location) is a cleared site, currently used for storage of mowing and landscaping equipment, a paved road extends to the site from Roosevelt Blvd; and Site 2 is further south adjacent to the east of Roosevelt Blvd on a wooded site adjacent to a power line right of way (**Figures 2.3-3** and **Figure 2.3-4**).

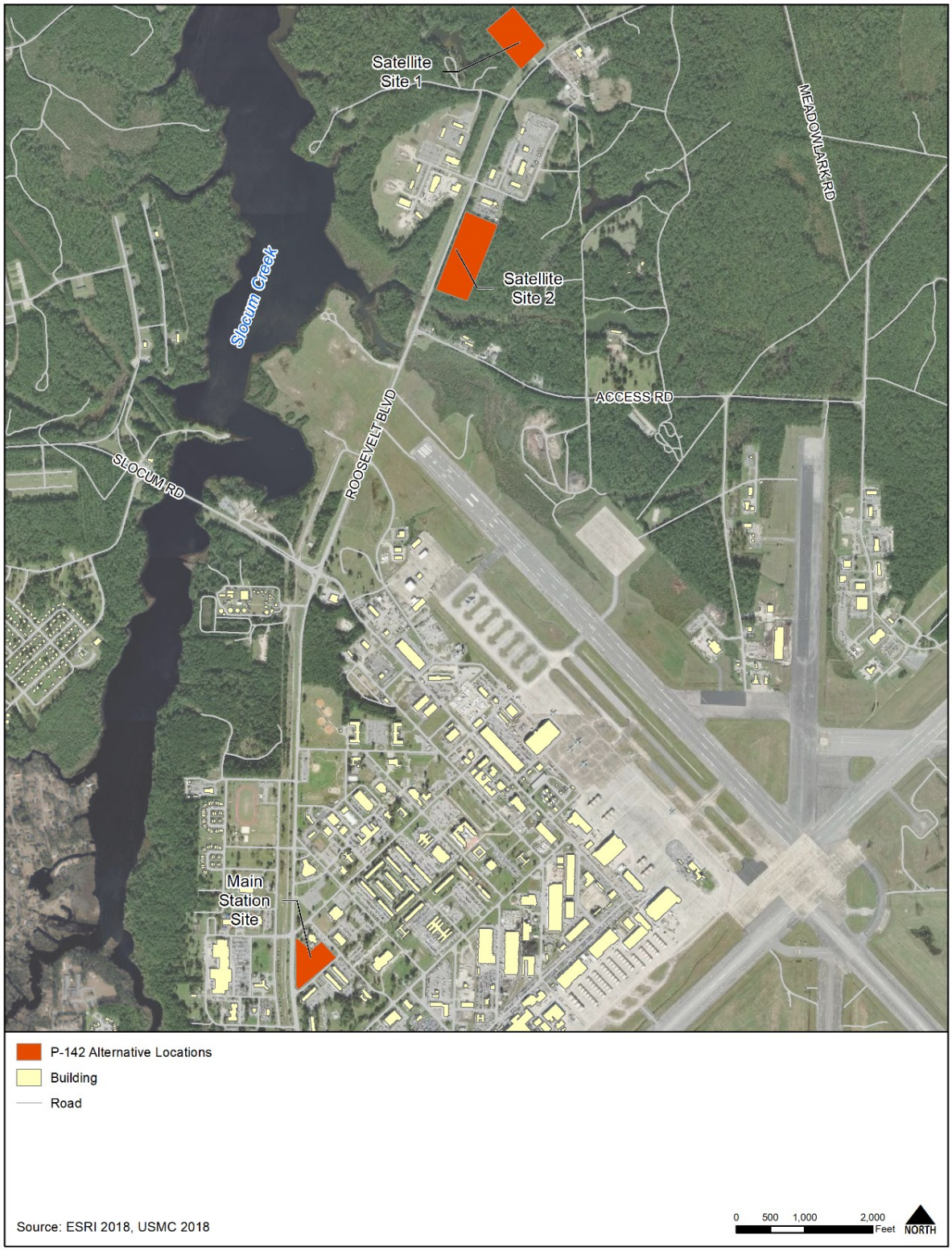

Figure 2.3-1. Proposed Locations of Main and Satellite Fire Stations

Figure 2.3-2. Proposed Main Station Site

Figure 2.3-3. Proposed Satellite Station Site 1

Figure 2.3-4. Proposed Satellite Station Site 2

2.3.2.2 Demolition

Once construction of the new fire stations is complete, the existing stations – building 193 (8,514 SF) and building 192 (4,198 SF) and Building 4203 (detached metal storage building next to building 193)- would be demolished. The ancillary storage buildings 4343 and 4562 would remain in place and would be repurposed.

2.4 Alternatives Considered but not Carried Forward for Detailed Analysis

The following alternatives were considered, but not carried forward for detailed analysis in this EA as they did not meet the purpose and need for the project and did not satisfy the reasonable alternative screening factors presented in Section 2.2.

As an alternative to the construction of new facilities, the possibility of leasing a facility off-station or renovating a facility on-station was considered. Leasing off-station would not provide adequate response times to all fire demand zones. Renovating existing fire stations or other on-station facilities were also considered as alternatives to new facilities construction on MCAS Cherry Point. There are no facilities available for renovation that would satisfy the response time requirements or space to accommodate modern facilities to support mission requirements**.**

2.5 Best Management Practices Included in the Proposed Action

This section presents an overview of the best management practices (BMPs) that are incorporated into the Proposed Action in this document. BMPs are existing policies, practices, and measures that the MCAS Cherry Point would adopt to reduce the environmental impacts of designated activities, functions, or processes. Although BMPs mitigate potential impacts by avoiding, minimizing or reducing/eliminating impacts, BMPs are distinguished from potential mitigation measures because BMPs are (1) existing

requirements for the Proposed Action, (2) ongoing, regularly occurring practices, or (3) not unique to this Proposed Action. In other words, the BMPs identified in this document are inherently part of the Proposed Action and are not potential mitigation measures proposed as a function of the NEPA environmental review process for the Proposed Action. **Table 2.5-1** includes a list of BMPs.

Table 2.5-1 Best Management Practices for the Proposed Action

BMP	Description	Impacts Reduced/Avoided
Erosion and Sediment Control Plan	The Erosion and Sediment Control Plan would identify site-specific BMPs to implement during construction and demolition activities, such as silt fencing, watering exposed soils, etc.	Reduce erosion at construction and demolition sites. Minimize impacts on nearby water resources from sedimentation.
Stormwater Pollution Prevention Plan	A Stormwater Pollution Prevention Plan would be prepared in accordance with a National Pollutant Discharge Elimination System (NPDES) permit. This plan would contain an erosion and sedimentation control plan. The plan would incorporate BMPs for erosion and sedimentation control, including techniques to diffuse and slow the velocity of stormwater runoff.	Reduce erosion, sedimentation, and stormwater runoff. Minimize impacts to nearby surface water resources.
Equipment cleaning and access, fill quality	Construction equipment and vehicles would be thoroughly cleaned before brought on site. All fill material brought to the construction site from off site would be checked to ensure that it is free from contaminants and does not contain any seeds or plant materials from non-native or invasive species. All mechanized clearing and grading, vehicle traffic, equipment staging, and the deposition of soil would be confined to the temporary and/or permanent project footprint or to other disturbed or developed land.	Reduce the potential for impacts from invasive/non-native plants and animals. Minimize soil disturbance footprint.
Fire Prevention Measures	The use of shields, protective mats, or other fire prevention equipment during grinding and welding to prevent or minimize the potential for fire. Vehicles would not be driven or parked in areas where catalytic converters could ignite dry vegetation. No smoking or disposal of cigarette butts would take place within vegetated areas.	Minimize the potential for fire.
Low Impact Development design features	Low Impact Development design features would be implemented to minimize the potential impacts to soils from stormwater runoff.	Reduce erosion, sedimentation, and stormwater runoff. Minimize impacts to nearby surface water resources.
Transportation coordination	Coordination with the responsible agencies regarding the use of public roads during project construction.	Minimize any disruption of local traffic

3 Affected Environment

This chapter presents a description of the environmental resources and baseline conditions that could be affected from implementing any of the alternatives and an analysis of the potential direct and indirect effects of each alternative.

All potentially relevant environmental resource areas were initially considered for analysis in this EA. In compliance with NEPA, CEQ, and Department of Navy and Marine Corps guidelines; the discussion of the affected environment (i.e., existing conditions) focuses only on those resource areas potentially subject to impacts. Additionally, the level of detail used in describing a resource is commensurate with the anticipated level of potential environmental impact.

"Significantly," as used in NEPA, requires considerations of both context and intensity. Context means that the significance of an action must be analyzed in several contexts such as society as a whole (e.g., human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of a proposed action. For instance, in the case of a site-specific action, significance would usually depend on the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant. Intensity refers to the severity or extent of the potential environmental impact, which can be thought of in terms of the potential amount of the likely change. In general, the more sensitive the context, the less intense a potential impact needs to be in order to be considered significant. Likewise, the less sensitive the context, the more intense a potential impact would be expected to be significant.

This section includes air quality, cultural resources, biological resources, visual resources, noise, infrastructure, transportation, and public health and safety. Resources that have little to no potential for impact have been eliminated from further evaluation. These include:

Airspace: The Proposed Action does not alter, use, or have the potential to affect airspace at the installation.

Hazardous Materials and Wastes: The Proposed Action would not introduce any new hazardous materials in the environment. All hazardous wastes generated by construction and demolition activities would be handled under the existing Resource Conservation and Recovery Act -compliant waste management programs and MCAS Cherry Point procedures.

Socioeconomics and Environmental Justice: The proposed construction and demolition activities, could generate short-term employment and income to civilian contractors as well as temporary beneficial impacts in the local economy, resulting from an increase in demand for goods and services. The Proposed Action would not change the local, regional, or statewide economics or social conditions or affect any specific population or demographic group. No impacts to socioeconomics and environmental justice would be expected.

Land Use and Coastal Zone: The Proposed Action would have little impact to existing land uses at MCAS Cherry Point. The main station location is located in land designated as Administrative/Operations per the 2014 Master Plan. The location of Satellite 1 is in a forested area designated as training, while Satellite 2 overlaps land designated as operations/recreation. The transition of any of these areas into use as a fire station would not create any negative impacts with regard to land use planning at MCAS Cherry Point. The Proposed Action would also remain consistent with Land Use policies at MCAS Cherry Point. Therefore, Land Use is not analyzed any further in this EA. There is a small tributary of Slocum

Creek near Site 2 under consideration for the Satellite Station, but the project area would be outside of this coastal resource. BMPs implemented during construction would reduce or eliminate the potential for impacts to coastal waters.

Water Resources: There are no wetlands or surface waters in the areas proposed for construction or demolition. While construction would expose soil to runoff, potentially creating minor temporary impacts to nearby surface waters and wetlands, an erosion and sediment control plan would be implemented to protect downstream surface waters and wetlands. Through implementation of BMPs, impacts to surface water would be reduced or eliminated.

Geological Resources: The proposed construction and demolition activities would require minor grading as well as potential removal or compaction of soils. In the case of the existing fire stations locations and the proposed main fire station site, soils and topography are already disturbed. The proposed Satellite Fire Station locations would require grading, and potentially filling, changing existing topography. Such impacts would be minor. Removal and/or compaction of soils could also occur during construction and demolition activities. Standard erosion and sedimentation control procedures, outlined in MCAS Cherry Point's stormwater pollution prevention plan, would be implemented to minimize impacts to soils.

3.1 Air Quality

This discussion of air quality includes criteria pollutants, standards, sources, permitting, and greenhouse gases (GHGs). Air quality in a given location is defined by the concentration of various pollutants in the atmosphere. A region's air quality is influenced by many factors, including the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions.

Most air pollutants originate from human-made sources, including mobile sources (e.g., cars, trucks, buses) and stationary sources (e.g., factories, refineries, power plants), as well as indoor sources (e.g., some building materials and cleaning solvents). Air pollutants are also released from natural sources such as volcanic eruptions and forest fires.

3.1.1 Regulatory Setting

3.1.1.1 Criteria Pollutants and National Ambient Air Quality Standards

The principal pollutants defining the air quality, called "criteria pollutants," include carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone, suspended particulate matter less than or equal to 10 microns in diameter (PM_{10}), fine particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$), and lead (Pb). CO, SO_2, Pb, and some particulates are emitted directly into the atmosphere from emissions sources. Ozone, NO_2, and some particulates are formed through atmospheric chemical reactions that are influenced by weather, ultraviolet light, and other atmospheric processes.

Under the CAA, the U.S. Environmental Protection Agency (USEPA) has established National Ambient Air Quality Standards (NAAQS) (40 CFR 50) for these pollutants. NAAQS are classified as primary or secondary. Primary standards protect against adverse health effects; secondary standards protect against welfare effects, such as damage to farm crops and vegetation and damage to buildings. Some pollutants have long-term and short-term standards. Short-term standards are designed to protect

against acute, or short-term, health effects, while long-term standards were established to protect against chronic health effects.

Areas that are and have historically been in compliance with the NAAQS are designated as attainment areas. Areas that violate a federal air quality standard are designated as nonattainment areas. Areas that have transitioned from nonattainment to attainment are designated as maintenance areas and are required to adhere to maintenance plans to ensure continued attainment. Areas that lack sufficient data to determine their classification are designated "unclassifiable," and are treated as attainment areas for the purpose of stationary source air permitting. MCAS Cherry Point is in a region designated as attainment/unclassifiable.

In addition to the NAAQS for criteria pollutants, national standards exist for hazardous air pollutants (HAPs), which are regulated under Section 112(b) of the 1990 CAA Amendments. The *National Emission Standards for Hazardous Air Pollutants* regulate HAP emissions from stationary sources (40 CFR 61).

3.1.1.2 Mobile Sources

HAPs emitted from mobile sources are called Mobile Source Air Toxics (MSATs). MSATs are compounds emitted from highway vehicles and non-road equipment that are known or suspected to cause cancer or other serious health and environmental effects. In 2001, USEPA issued its first MSAT Rule, which identified 201 compounds as being HAPs that require regulation. A subset of six of the MSAT compounds was identified as having the greatest influence on health and included benzene, butadiene, formaldehyde, acrolein, acetaldehyde, and diesel particulate matter. USEPA issued a second MSAT Rule in February 2007, which generally supported the findings in the first rule and provided additional recommendations of compounds having the greatest impact on health. The rule also identified several engine emission certification standards that must be implemented (40 CFR 59, 80, 85, and 86; Federal Register Volume 72, No. 37, pp. 8427–8570, 2007). Unlike the criteria pollutants, there are no NAAQS for benzene and other HAPs. The primary control methodologies for these pollutants for mobile sources involves reducing their content in fuel and altering the engine operating characteristics to reduce the volume of pollutant generated during combustion.

3.1.1.3 General Conformity

The USEPA General Conformity Rule applies to federal actions occurring in nonattainment or maintenance areas when the total direct and indirect emissions of nonattainment pollutants (or their precursors) exceed specified thresholds. Because MCAS Cherry Point is located in an area of good air quality designated as attainment/unclassified, the General Conformity Rule does not apply.

3.1.1.4 Permitting

The proposed action involves construction that involves use of mobile sources that generate air pollutant emissions. The operation of the fire department facilities, once constructed, will not include any new or modified major stationary sources and therefore is not carried forward in the analysis.

3.1.1.5 Greenhouse Gases

GHGs are gas emissions that trap heat in the atmosphere. These emissions occur from natural processes and human activities. Scientific evidence indicates a trend of increasing global temperature over the past century due to an increase in GHG emissions from human activities. The climate change associated

with this global warming is predicted to produce negative economic and social consequences across the globe.

In an effort to reduce energy consumption, reduce GHGs, reduce dependence on petroleum, and increase the use of renewable energy resources the Navy has implemented a number of renewable energy projects. The Navy has established Fiscal Year 2020 GHG emissions reduction targets of 34 percent from a FY 2008 baseline for direct GHG emissions and 13.5 percent for indirect emissions. Examples of Navy-wide GHG reduction projects include energy efficient construction, thermal and photovoltaic solar systems, geothermal power plants, and the generation of electricity with wind energy. The Navy continues to promote and install new renewable energy projects.

3.1.2 Affected Environment

The most recent emissions inventory for Craven County is shown in **Table 3.1-1**. Volatile organic compound (VOC) and nitrogen oxide (NO_x) emissions are used to represent ozone generation because they are precursors of ozone.

Table 3.1-1. Craven County Air Emissions Inventory (2014)

Location	VOC (tpy)	CO (tpy)	NOx (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Craven County	24,700	31,869	3,193	1,134	3,472	1,866

Source: USEPA 2019.

Legend: tpy = tons per year; NO_x = nitrogen oxide; VOC = Volatile Organic Compound; CO = Carbon Monoxide; SO_2 = sulfur dioxide; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter.

3.1.3 Environmental Consequences

Effects on air quality are based on estimated direct and indirect emissions associated with the action alternatives. The region of influence (ROI) for assessing air quality impacts is the air basin in which the project is located, Craven County, North Carolina.

Estimated emissions from a proposed federal action are typically compared with the relevant national and state standards to assess the potential for increases in pollutant concentrations.

3.1.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to baseline air quality. Therefore, no significant impacts to air quality or air resources would occur with implementation of the No Action Alternative.

3.1.3.2 Fire Station Construction and Demolition (Preferred Alternative)

Potential Impacts

The construction of a new Main Fire Station and a smaller Satellite Fire Station and the demolition of the old facilities would generate small, localized air quality impacts for a period of months. Once the stations are constructed, emissions related to operations would be minimal and not anticipated to be in excess of any air emissions generated by the existing fire station current operations. Therefore, the air quality impacts of the Proposed Action are limited to those created by the demolition and construction activities. **Appendix A** contains Air Quality calculations.

For attainment area criteria pollutants, the project air quality analysis uses the USEPA's Prevention of Significant Deterioration (PSD) permitting threshold of 250 tons per year (tpy) as an initial indicator of the local significance of potential impacts to air quality. In the context of criteria pollutants for which the proposed project region is in attainment of a NAAQS, the analysis compares the annual net increase in emissions estimated for each project alternative to the 250 tpy PSD permitting threshold. The PSD permitting threshold represents the level of potential new emissions below which a new or existing minor non-listed stationary source may acceptably emit without triggering the requirement to obtain a permit. Thus, if the intensity of any net emissions increase for a project alternative is below 250 tpy in the context of an attainment criteria pollutant the indication is the air quality impacts will be insignificant for that pollutant.

The Main Fire Station is anticipated to require up to 12 months of construction, and the smaller Satellite Fire Station may take six to nine months. The demolition of the existing stations would take approximately one month. To provide a worst-case estimate of emissions, demolition and construction of both facilities was evaluated as occurring during the same year. The Satellite Site could involve initial tree clearing, whereas the main fire station site is already open. **Table 3.1-2** presents the estimated construction emissions for both facilities.

Table 3.1-2. Estimated Construction Emissions for Fire Station Construction

Summary	VOC tpy	CO tpy	NO_x tpy	SO_2 tpy	PM_{10} tpy	$PM_{2.5}$ tpy	CO_2 MT/yr
Emissions	0.3	1.0	1.4	0.6	2.6	0.4	229
Comparative Threshold	250	250	250	250	250	250	25,000
Exceed Threshold?	No	No	No	No	No	No	No

Note: [1]2014 CEQ
Legend: tpy = tons per year; MT/yr = metric tons per year, CO_2 = carbon dioxide

Construction emissions do not exceed the comparative threshold and are very low. Therefore, implementation of the Preferred Alternative would not result in significant impacts to air quality.

Greenhouse Gases

Implementation of the Preferred Alternative would contribute directly to emissions of GHGs from the combustion of fossil fuels. Demolition, construction, and clearing activities would generate approximately 252 tons (229 metric tons) of CO_2. This would be comparable to having an additional 45 cars driving an average of 11,500 miles for one year and is well below the 2014 CEQ draft guidance threshold for quantification of 25,000 tons.

3.2 Cultural Resources

This discussion of cultural resources includes prehistoric and historic archaeological sites; historic buildings, structures, and districts; and physical entities and human-made or natural features important to a culture, a subculture, or a community for traditional, religious, or other reasons. Cultural resources can be divided into three major categories:

- Archaeological resources (prehistoric and historic) are locations where human activity measurably altered the earth or left deposits of physical remains.
- Architectural resources include standing buildings, structures, landscapes, and other built-environment resources of historic or aesthetic significance.

- Traditional cultural properties may include archaeological resources, structures, neighborhoods, prominent topographic features, habitat, plants, animals, and minerals that Native Americans or other groups consider essential for the preservation of traditional culture.

3.2.1 Regulatory Setting

Cultural resources are governed by federal laws and regulations, including the NHPA, Archeological and Historic Preservation Act, American Indian Religious Freedom Act, Archaeological Resources Protection Act of 1979, and the Native American Graves Protection and Repatriation Act of 1990. Federal agencies' responsibility for protecting historic properties is defined primarily by sections 106 and 110 of the NHPA. Section 106 requires federal agencies to take into account the effects of their undertakings on historic properties. Section 110 of the NHPA requires federal agencies to establish—in conjunction with the Secretary of the Interior—historic preservation programs for the identification, evaluation, and protection of historic properties. Cultural resources also may be covered by state, local, and territorial laws.

3.2.2 Affected Environment

Cultural resources listed in the National Register of Historic Places (NRHP) or eligible for listing in the NRHP are "historic properties" as defined by the NHPA. The list was established under the NHPA and is administered by the National Park Service on behalf of the Secretary of the Interior. The NRHP includes properties on public and private land. Properties can be determined eligible for listing in the NRHP by the Secretary of the Interior or by a federal agency official with concurrence from the applicable State Historic Preservation Office (SHPO). A NRHP-eligible property has the same protections as a property listed in the NRHP. The historical properties include archaeological and architectural resources.

The Marine Corps has conducted inventories of cultural resources at MCAS Cherry Point to identify historical properties that are listed or potentially eligible for listing in the NRHP (MCAS Cherry Point 2018).

The area of potential effects (APE) for cultural resources is the geographic area or areas within which an undertaking (project, activity, program or practice) may cause changes in the character or use of any historic properties present. The APE is influenced by the scale and nature of the undertaking and may be different for various kinds of effects caused by the undertaking. For this Proposed Action, the Marine Corps determined that the architectural APE includes a total of 88.5 acres and covers five areas where demolition and construction would occur: the areas of the existing fire stations (buildings 192 and 193) proposed for demolition, the proposed area for the Main Station, and the two alternative areas for the Satellite Station. These five areas are collectively defined as the project area and include the buildings within the view shed of the project area (**Figures 3.2-1 through 3.2-5**). It should be noted that Site 1 is the preferred location for the Satellite Station (**Figure 3.2-4**).

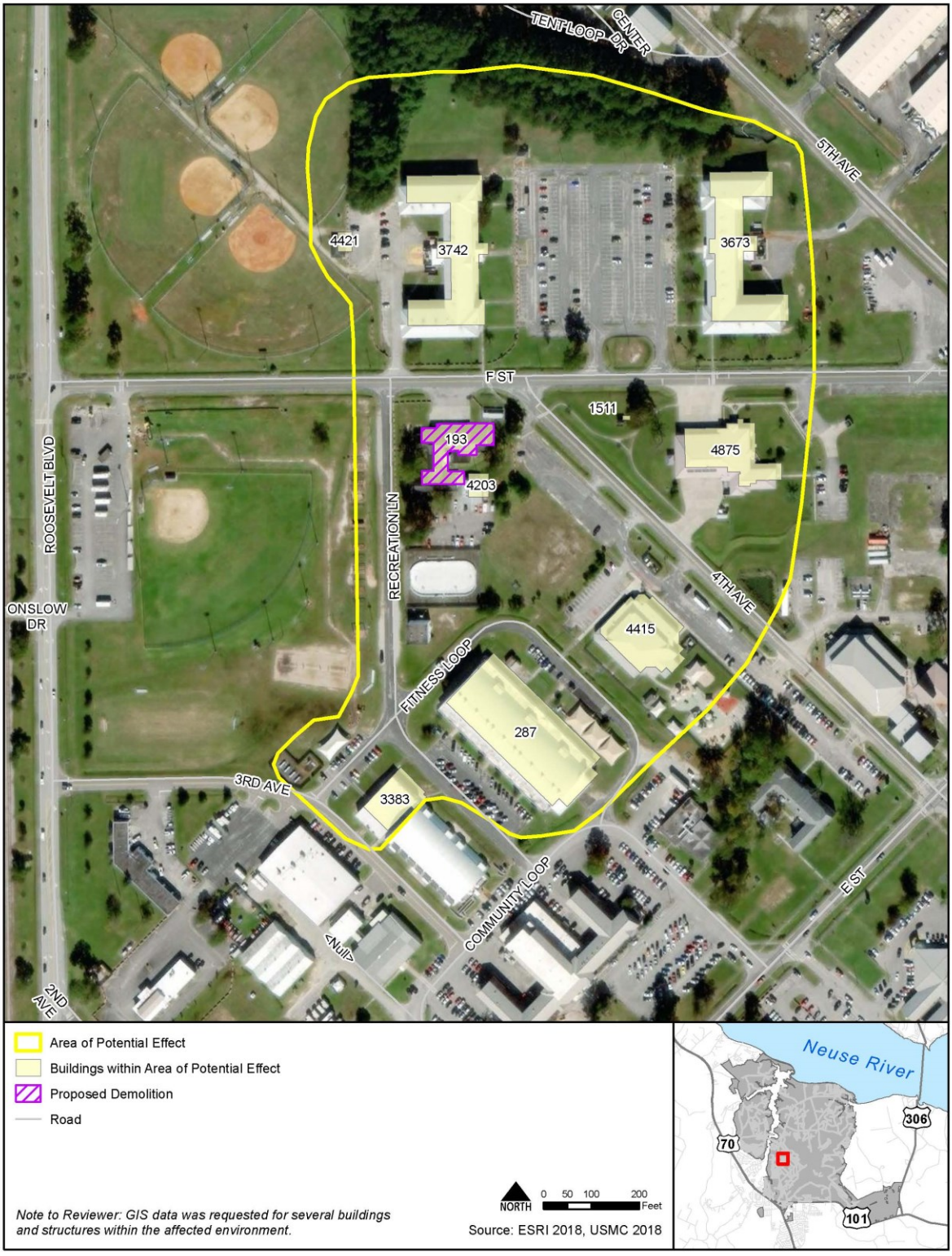

Figure 3.2-1. APE for Existing Main Fire Station (Building 193)

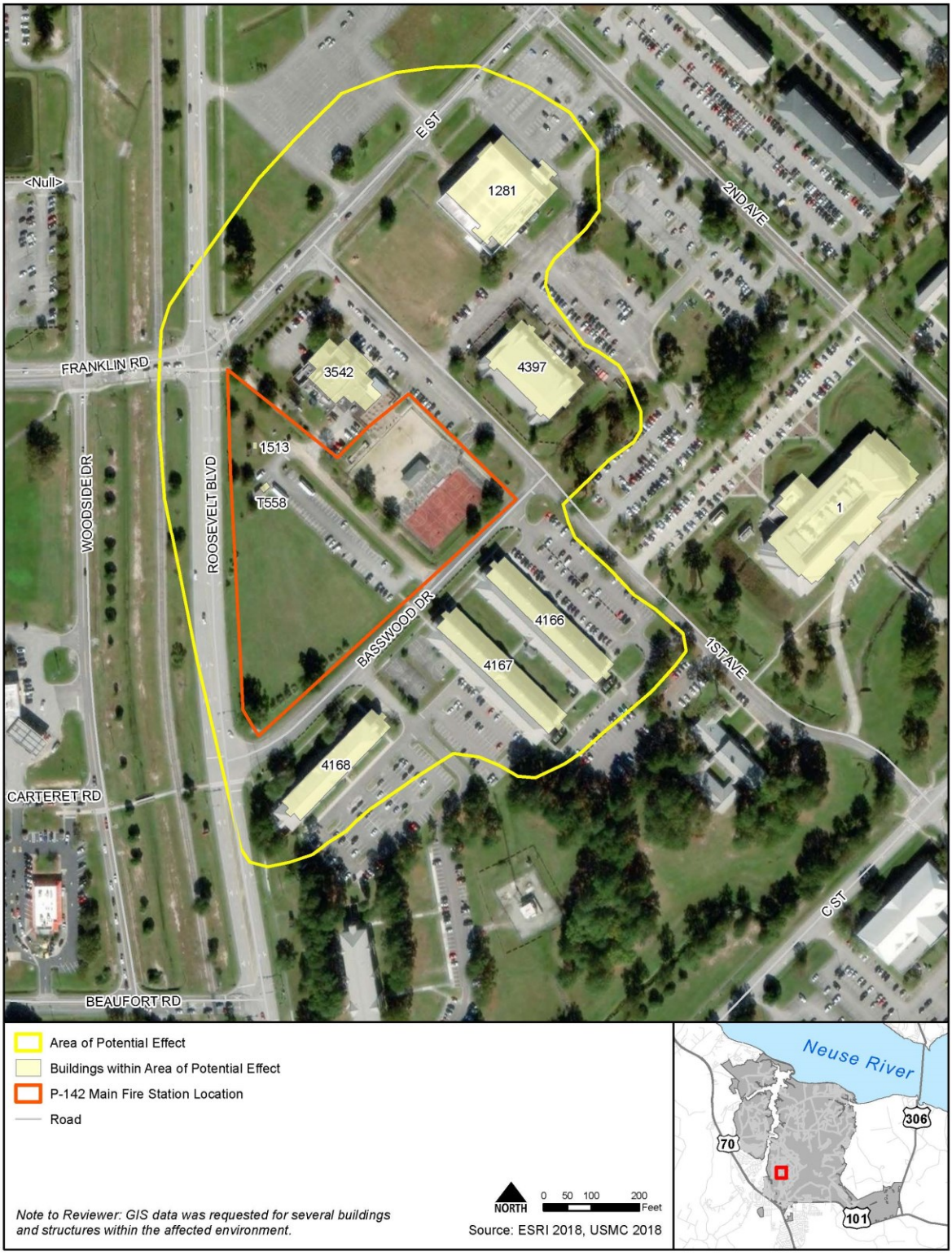

Figure 3.2-2. APE for Proposed Main Fire Station

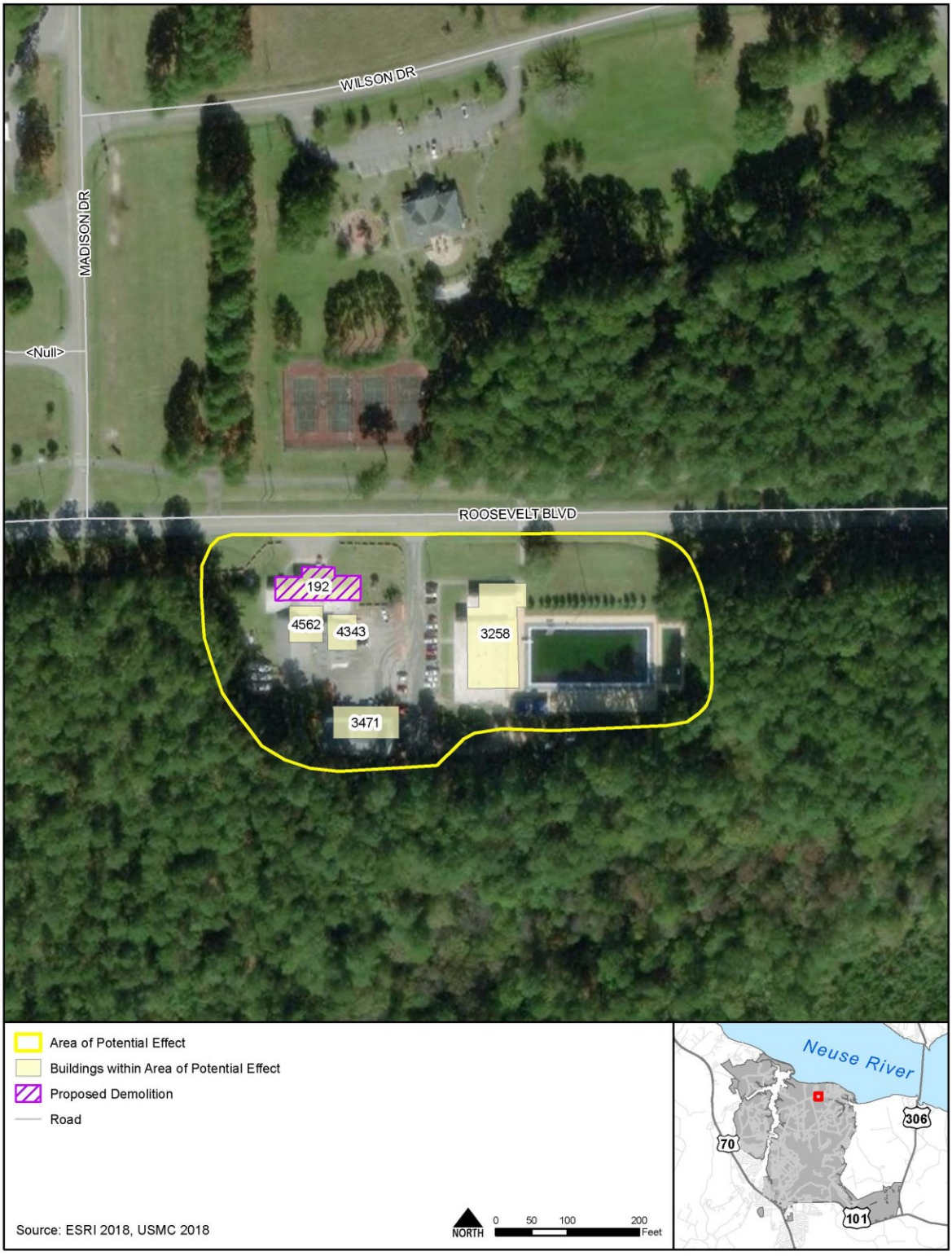

Figure 3.2-3. APE for Existing Satellite Fire Station (Building 192)

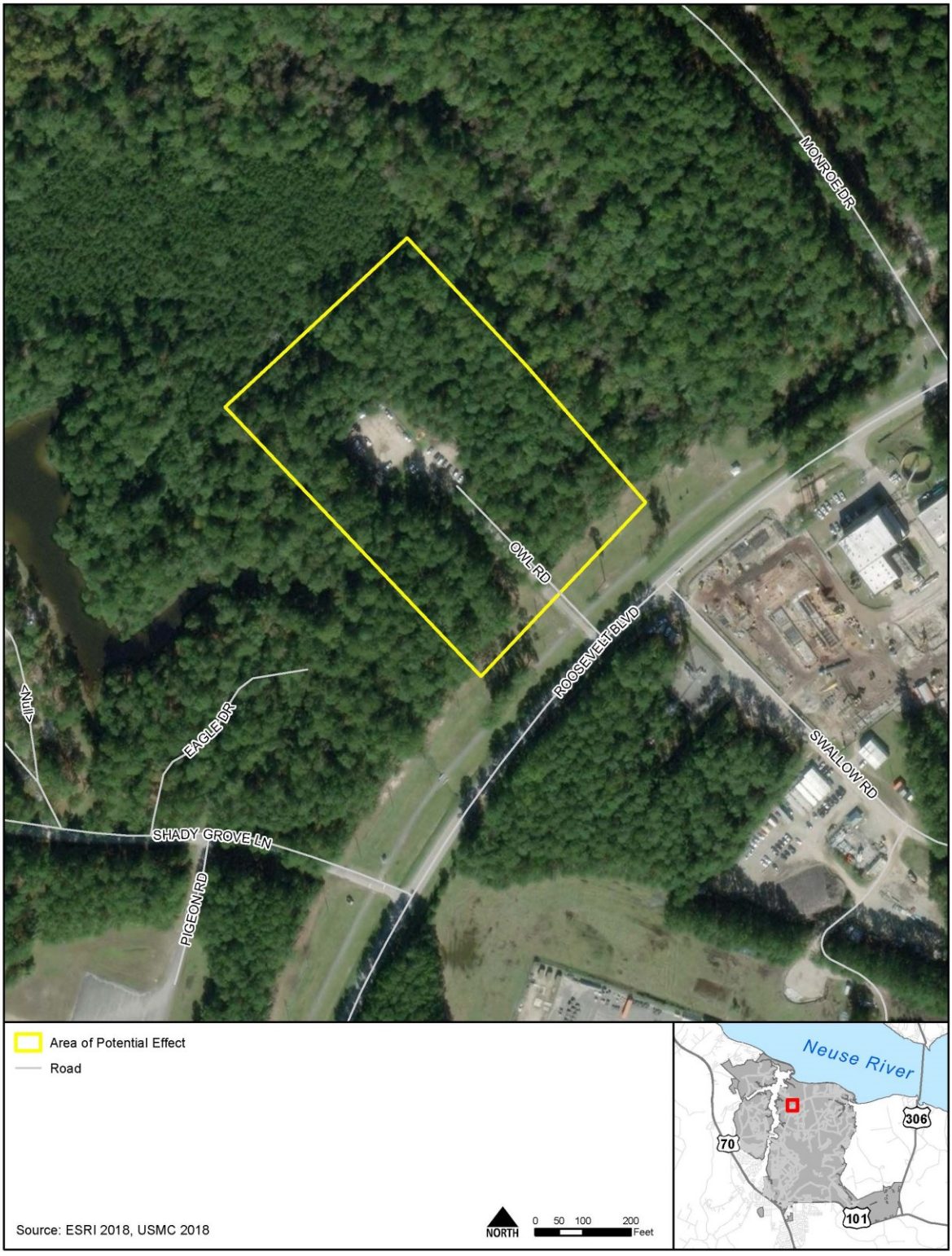

Figure 3.2-4. APE for Proposed Satellite Station (Site 1)

Figure 3.2-5. APE for Proposed Satellite Station (Site 2)

3.2.2.1 Archaeological Resources

Through the use of predictive modeling and previous field surveys, MCAS Cherry Point, in consultation with the North Carolina SHPO, has identified all areas within the installation boundary that contain high probability archaeologically sensitive soils (Davis et al. 1997; Clement and Harrell 2013). The area proposed for construction of the Main Station (See **Figure 3.2-2**) has been identified by a 2013 Archaeological Disturbance Assessment as heavily disturbed (Clement and Harrell 2013), and no archaeological sites have been identified at this site in previous surveys (MCAS Cherry Point 2018).

The preferred location for the Satellite Station (Site 1 shown on **Figure 3.2-4**), has been surveyed as part of the 1997 archaeological probability study and no archaeological resources were identified (Davis et al. 1997). No archaeological surveys have been completed at Site 2 (see **Figure 3.2-5**) and it is not located in an area of heavy ground disturbance (MCAS Cherry Point 2018; Clement and Harrell 2013).

3.2.2.2 Architectural Resources

In 1996, MCAS Cherry Point surveyed 929 buildings and structures within the affected environment. None of the surveyed buildings were determined eligible for listing in the NRHP (MCAS 2018). The buildings located in the APE for each of the proposed demolition and construction sites are listed below and summarized in **Table 3.2.1.**

Table 3.2-1. Architecture Resources within the Areas of Potential Effect for the Proposed Demolition and Construction Activities

Building Number	Current Use	NRHP eligibility	Notes
APE for Existing Main Fire Station			
Building 193	Fire Station	Not Eligible	MCAS Cherry Point 2018
Building 287	Gymnasium	Not Eligible	MCAS Cherry Point 2018
Building 1511	Pump House	Unlikely to be Eligible	Over 50 years old
Building 3383	Combat Pool Bath House	Unlikely to be Eligible	Over 50 years old
Building 3673	BEQ	Not Eligible under Criteria Consideration G	Less than 50 years old
Building 3742	BEQ	Not Eligible under Criteria Consideration G	Less than 50 years old
Building 4203	General Storage	Not Eligible under Criteria Consideration G	Less than 50 years old
APE for Proposed Main Fire Station			
Building 1281	Bowling Center	Unlikely to be Eligible	Over 50 years old
Building 1513	Pump House	Unlikely to be Eligible	Over 50 years old
Building 3542	Recreation Center	Not evaluated	Re-evaluate at 50 years old
Building 4166	BEQ	Not evaluated	Re-evaluate at 50 years old
Building 4167	BEQ	Not evaluated	Re-evaluate at 50 years old
Building 4168	BEQ	Not evaluated	Re-evaluate at 50 years old

Table 3.2-1. Architecture Resources within the Areas of Potential Effect for the Proposed Demolition and Construction Activities (cont.)

Building Number	Current Use	NRHP eligibility	Notes
APE for Existing Satellite Fire Station			
Building 192	Fire Station	Not Eligible	MCAS Cherry Point 2018
Building 3471	HITT Fitness Center	Not Eligible	MCAS Cherry Point 2018
Building 3258	Fitness Center	Recommended Not Eligible	Over 50 years old; SHPO concurrence
Building 4343	Fire Station 2	Not evaluated	Re-evaluate at 50 years old

APE for Existing Main Fire Station. Buildings 193 (Fire Station) and 287 (Gymnasium) were determined not eligible for listing on the NRHP (MCAS 2018). Buildings 1511 (Pump House) and 3383 (Combat Pool Bath House) are 50 years or older but have not been evaluated for listing in the NRHP. Building 1511 (a support building) and Building 3383 (a recreation facility likely not tied to the Cold War-era mission), are unlikely to be eligible for the NRHP. Cold War-era Buildings 3742 and 3673 (Bachelor Enlisted Quarters [BEQ] built in 1975 and 1976, respectively) and 4203 (General Storage, constructed in 1985) have not reached 50 years in age. In a letter from the Deputy SHPO about the results of architectural investigations at MCAS Cherry Point, the Deputy SHPO concurred that "none of the Cold War resources meet National Register Criteria exception G for properties that have gained exceptional significance within the last fifty years" (Brook 1998). The SHPO recommended the buildings be re-evaluated when the resources are 50 years old. Several small buildings and structures within the APE for the existing Main Fire Station have not been surveyed; however, they are likely to be minor support buildings and are unlikely to be eligible for listing in the NRHP (**See Figure 3.2-1**).

APE for Proposed Main Station. Buildings 1281 (Bowling Center) and 1513 (Pump House) are within the APE and are over 50 years in age but have not been evaluated for listing in the NRHP. Buildings 1281 is a recreational facility and was not likely tied to a Cold War-era mission and therefore is unlikely eligible for the NRHP. Building 1513 has not been formally evaluated but due to similarity in construction to other pump houses from the same time frame that have been evaluated and determined to need no further work, is not likely eligible for the NRHP. Cold War-era Buildings 3542 (Recreation Center), 4166 (BEQ), 4167 (BEQ), and 4168 (BEQ) are less than fifty years old. As indicated above, none of the Cold War-era resources less than 50 years old at MCAS Cherry Point meet NRHP Criteria Consideration G for exceptional significance (Brook 1998). They will be re-evaluated when they are 50 years old. Several small buildings / structures within the affected environment for the proposed Main Station have not been surveyed; however, they are minor support buildings and are unlikely to be eligible for listing in the NRHP (**See Figure 3.2-2**).

APE for Existing Satellite Fire Station. Building 192 (Fire Station) and Building 3471 (HITT Fitness Center) were determined not eligible for listing in the NRHP (MCAS 2018). Building 3258 (Fitness Center) is over 50 years in age. An Architectural Survey Update conducted by SEARCH Inc. in 2019, recommended Building 3258 as not eligible for listing in the NRHP (SEARCH Inc. 2019) and SHPO has concurred. Cold War-era Building 4343 (Fire Station 2) is less than 50 years old and has not been evaluated for the NRHP. As indicated above, none of the Cold War-era resources less than 50 years old at MCAS Cherry Point meet NRHP Criteria Consideration G for exceptional significance (Brook 1998). They will be re-evaluated when the resources are 50 years old (**See Figure 3.2-3**).

APE for Proposed Satellite Station (Site 1). There are no architectural resources within the APE (**See Figure 3.2-4**).

APE for Proposed Satellite Station (Site 2). There are no architectural resources within the APE (**See Figure 3.2-5**).

3.2.2.3 Traditional Cultural Properties

MCAS Cherry Point has not been the subject of a traditional cultural properties study and no traditional cultural properties have been identified at MCAS Cherry Point or its associated properties (MCAS Cherry Point 2018).

One federally recognized American Indian tribe, the Catawba Indian Nation has historically occupied and/or used MCAS Cherry Point lands.

The Navy consults with federally recognized Indian tribes (or Native Hawaiian or Alaska Native Organizations) on actions with the potential to significantly affect protected tribal resources, tribal treaty rights, or Indian lands. The MCAS Cherry Point Integrated Cultural Resources Management Plan (ICRMP) includes established protocols, for consulting with tribes regarding cultural resources such as traditional cultural properties. No Tribe(s) with Usual and Accustomed grounds and stations have been identified at MCAS Cherry Point or the associated properties (MCAS Cherry Point 2018).

3.2.3 Environmental Consequences

Analysis of potential impacts to cultural resources considers both direct and indirect impacts. Direct impacts may be the result of physically altering, damaging, or destroying all or part of a resource, altering characteristics of the surrounding environment that contribute to the importance of the resource, introducing visual, atmospheric, or audible elements that are out of character for the period the resource represents (thereby altering the setting), or neglecting the resource to the extent that it deteriorates or is destroyed. Indirect impacts primarily result from the effects that are farther removed from the immediate project area including visual, audible (noise), or atmospheric changes due to the project implementation.

3.2.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to cultural resources. Therefore, no significant impacts to cultural resources would occur with implementation of the No Action Alternative.

3.2.3.2 Fire Station Construction and Demolition (Preferred Alternative)

Archaeological Resources

Demolition of Existing Main and Satellite Stations; Construction of New Main Station

MCAS Cherry Point has been heavily disturbed by construction of buildings and roads, existing utilities, and military training activities. The existing main fire station, existing Satellite Station, and the area proposed for the new main fire station are all located in areas where ground disturbance has destroyed subsurface integrity and there is a low probability that investigations would yield intact archaeological deposits (Clement and Harrell 2013). It is unlikely that these activities of the Proposed Action would have significant impacts to archaeological resources.

Proposed Satellite Station, Site 1 (Preferred Location)

The entire Site 1 has been subjected to archaeological survey and no cultural resources were identified (Davis et al. 1997). Because there are no NRHP eligible archaeological resources in Site 1, the proposed action would have no significant impacts to archaeological resources.

Proposed Satellite Station, Site 2

No archaeological surveys have been performed at Site 2 and the area was not included in an area where ground disturbance has destroyed the potential to recover significant archaeological deposits (MCAS Cherry Point 2018; Clement and Harrell 2013). While Site 2 is not the preferred location for the construction of the new Satellite Fire Station, should this area be chosen, MCAS Cherry Point would determine the presence of NRHP eligible archaeological resources through consultation with the North Carolina SHPO and complete appropriate archaeological investigations.

In the unlikely event that previously unrecorded archaeological sites were encountered during any of the construction or demolition activities, work in the immediate area would stop and MCAS Cherry Point would follow the Standard Operating Procedure for Unexpected Discoveries, per the installation ICRMP. The 2018 ICRMP outlines three options in the event of unexpected discovery of cultural resources including contacting the NAVFAC Atlantic Archaeologist, preparing a Mitigation Plan, or initiating the Section 106 compliance process. Similarly, if Native American human remains, funerary items, sacred objects, or items of cultural patrimony are encountered, work would stop in the area and the steps outlined in the ICRMP would be implemented (MCAS Cherry Point ICRMP 2018).

Architectural Resources

Existing Main Fire Station

Building 193 was determined not eligible for listing in the NRHP. Buildings 1511 and 3383 are unlikely to be eligible for listing in the NRHP 3673, 3742, and 4203 are less than 50 years in age. Several small buildings / structures within the affected environment have not been surveyed; however, they are likely to be minor support buildings and are unlikely to be eligible for listing in the NRHP. Therefore, as there are no eligible resources within the APE of the Existing Main Fire Station, there would be no effect under Section 106 of the NHPA.

Existing Satellite Fire Station

Buildings 1513 and 1281 are unlikely to be eligible for listing in the NRHP because Building 1513 is a support building and Building 1281 is a recreational building. Buildings 3542, 4166, 4167, and 4168 are less than 50 years in age. Several small buildings / structures within the affected environment have not been surveyed; however, they are likely to be minor support buildings and are unlikely to be eligible for listing in the NRHP. Therefore, as there are no eligible resources within the APE of the Existing Satellite Fire Station, there would be no effect under Section 106 of the NHPA.

Proposed Main Fire Station

Buildings 192, 3471, and 3258 are not eligible for listing in the NRHP. Building 4343 is less than 50 years in age. Therefore, there would be no effect under Section 106 of the NHPA, as there are no eligible historic architectural resources within the APE of the Proposed Main Fire Station.

Proposed Satellite Station, Sites 1 and 2

Since there are no architectural resources considered eligible for listing in the NRHP at either of these sites, there would be no adverse effect under Section 106 of the NHPA. The Preferred Alternative would have no significant impact to architectural resources at MCAS Cherry Point.

Traditional Cultural Properties

No known traditional cultural properties have been identified at MCAS Cherry Point. Therefore, the Preferred Alternative would have no impact on traditional cultural properties.

3.3 Biological Resources

Biological resources include living, native, or naturalized plant and animal species and the habitats within which they occur. Plant associations are referred to generally as vegetation, and animal species are referred to generally as wildlife. Habitat can be defined as the resources and conditions present in an area that support a plant or animal.

Within this EA, biological resources are defined as terrestrial vegetation and wildlife. There are no threatened or endangered species or critical habitats that could occur in the areas affected by the proposed action. The proposed action would not affect the aquatic or marine environment.

3.3.1 Regulatory Setting

Birds, both migratory and most native-resident bird species, are protected under the MBTA, and their conservation by federal agencies is mandated by EO 13186 (Migratory Bird Conservation). Under the MBTA it is unlawful by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, [or] possess migratory birds or their nests or eggs at any time, unless permitted by regulation. The 2003 National Defense Authorization Act gave the Secretary of the Interior authority to prescribe regulations to exempt the Armed Forces from the incidental taking of migratory birds during authorized military readiness activities. The final rule authorizing the DoD to take migratory birds in such cases includes a requirement that the Armed Forces must confer with the US Fish and Wildlife Service (USFWS) to develop and implement appropriate conservation measures to minimize or mitigate adverse effects of the proposed action if the action will have a significant negative effect on the sustainability of a population of a migratory bird species.

3.3.2 Affected Environment

3.3.2.1 Vegetation

There are five natural community types present on MCAS Cherry Point: pine, grassland, pine–hardwood, hardwood, and hardwood–pine (See **Table 3.3-1**). The most abundant community type is forests, with 6,913 acres of hardwood and pine forests (approximately 81% of the natural communities). Pine forest is the dominant natural community, totaling 4,222 acres distributed throughout the Main Station. Loblolly pine dominates the canopy in broad interstream areas. Loblolly forests are burned by prescription on a 3–5 year cycle to facilitate military training, reduce wildfire danger, improve wildlife habitat, and promote native plant communities (MCAS Cherry Point 2012).

Table 3.3-1. Natural Vegetation Communities at MCAS Cherry Point

Natural Community	Acres
Pine	4,222
Grassland	1,631
Pine–Hardwood	1,499
Hardwood	670
Hardwood–Pine	522
Total	**8,544**

The existing Main and Satellite Fire Stations as well as the proposed Main Fire Station are located in developed areas that support no natural vegetation. The proposed Satellite Station Site 1 is located in an area that is partially cleared of natural vegetation and partially covered by pine-hardwood forest. The proposed Satellite Fire Station site 2 is located in a pine forest. These areas are characterized by loblolly pine (*Pinus taeda*), live oak (*Quercus virginiana*), Darlington oak (*Quercus hemisphaerica*), yaupon (*Ilex vomitoria*), and Spanish moss (*Tillandsia usneoides*).

3.3.2.2 Wildlife

Common mammal species at MCAS Cherry Point include white-tailed deer (*Odocoileus virginianus*), bobcat (*Lynx rufus*), gray fox (*Urocyon cinereoargenteus*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), swamp rabbit (*Sylvilagus aquaticus*), eastern cottontail (*Sylvilagus floridanus*), eastern gray squirrel (*Sciurus carolinensis*), fox squirrel (*Sciurus niger)*, and many small rodents and shrews. Bird species that are widespread include wild turkey (*Meleagris gallopavo*), northern bobwhite (*Colinus virginianus*), and the mourning dove (*Zenaida macroura*). Resident and migratory waterfowl are also common. Ibis (subfamily *Threskiornithinae*), cormorants (family *Phalacrocoracidae*), herons and egrets (family *Ardeidae*), and belted kingfisher (*Ceryle alcyon*) are common throughout flooded areas. Common songbirds include red-eyed vireo (*Vireo olivaceus*), cardinal (family *Cardinalidae*), tufted titmouse (*Baeolophus bicolor*), ruby-throated hummingbird (*Archilochus colubris*), eastern towhee (*Pipilo erythrophthalmus*), wood thrush (*Hylocichla mustelina*), summer tanager (*Piranga rubra*), blue-gray gnatcatcher (*Polioptila caerulea*), hooded warbler (*Wilsonia citrina*), and Carolina wren (*Thryothorus ludovicianus*). Common herpetofauna include box turtle (*Terrapene* spp.), common garter snake (*Thamnophis sirtalis*), eastern diamondback rattlesnake (*Crotalus adamanteus*), timber rattlesnake (*Crotalus horridus*), and American alligator.

3.3.3 Environmental Consequences

3.3.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to biological resources. Therefore, no significant impacts to biological resources would occur with implementation of the No Action Alternative.

3.3.3.2 Fire Station Construction and Demolition (Preferred Alternative)

Demolition of Fire Stations. The proposed demolition of the existing Main and Satellite Fire Stations is not expected to affect natural vegetation or wildlife. Vegetation in these areas has been previously removed and is managed as mown areas of the cantonment area. Such areas contain no natural habitat but could be used by some species for foraging or transiting from one natural habitat area to another.

No impacts to natural vegetation communities would result from demolition of existing facilities. Wildlife near the demolition areas could be disturbed or displaced by noise, though the airfield dominates the noise environment on base.

Construction of Fire Stations. The proposed construction of the main fire station would occur in a previously disturbed area of the base that supports no vegetation and provides no natural habitat to wildlife. Wildlife in the area could be disturbed by construction noise as described above for demolition. The proposed Satellite Station Site 1 has been partially cleared of natural vegetation and is currently fenced and covered with stone. This area supports no wildlife. Adjacent to this fenced area stands pine and pine-hardwood forest. Some of this natural vegetation would be removed for construction of the fire station and this would also remove wildlife habitat. Noise could displace wildlife temporarily during construction activities in the area immediately surrounding the construction site.

Satellite Station Site 2 is located in a pine forest. Vegetation would be cleared to make way for construction of the fire station. Wildlife habitat would be removed and wildlife in adjacent areas displaced temporarily during construction activities. Construction of the Satellite Station would result in the removal of some natural pine or pine-hardwood vegetation, however the small area would represent only a fraction of the natural vegetation and wildlife habitat on the base. Therefore, implementation of the Preferred Alternative would not result in significant impacts to biological resources.

3.4 Visual Resources and Recreation

This discussion of visual resources includes the natural and built features of the landscape visible from public views that contribute to an area's visual quality. Visual perception is an important component of environmental quality that can be impacted through changes created by various projects. Visual impacts occur as a result of the relationship between people and the physical environment.

Recreation includes indoor and outdoor activities that take place away from the residence of the participant. For this analysis, recreation includes activities that occur on MCAS Cherry Point.

3.4.1 Regulatory Setting

There is no regulatory driver for the analysis of impacts to visual resources or recreation at MCAS Cherry Point.

3.4.2 Affected Environment

MCAS Cherry Point possesses the characteristics of a military airfield where the visual sensitivity is very low. The site proposed for the Main Station and the two sites proposed for the Satellite Station are not visible from outside of the Installation.

Recreational opportunities available at MCAS Cherry Point include golf at the Sound of Freedom Golf Course; swimming at the Hancock and Cedar Creek pools; one paintball field, a rock climbing wall, a zipline course, and mountain bike trails at Devil Dog Dare; rentals of stand-up paddleboards, kayaks and canoes from Outdoor Connection; and organized team sports for both adults and youth. Sports fields and facilities on MCAS Cherry Point include the multi-purpose field, softball fields, beach volleyball courts, hockey rink, and Lanham Field Athletics Sports Complex (MCAS Cherry Point 2019).

3.4.3 Environmental Consequences

The evaluation of visual resources in the context of environmental analysis typically addresses the contrast between visible landscape elements. Collectively, these elements comprise the aesthetic environment, or landscape character. The landscape character is compared to the Proposed Action's visual qualities to determine the compatibility or contrast resulting from the buildout and demolition activities associated with the Proposed Action.

3.4.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to visual resources or recreation. Therefore, no significant impacts would occur with implementation of the No Action Alternative.

3.4.3.2 Fire Station Construction and Demolition (Preferred Alternative)

Visual Resources

The proposed site for the Main Station is a cleared site and paved parking lot, near existing barracks and basketball courts. The proposed site 1 for the Satellite Station is a cleared area that is currently used for storage of mowing and landscaping equipment, and Site 2 for the Satellite Station is a forested area. The facility design for the Main Station and the Satellite Station would be in line with and have similar character as the surrounding facilities and would not create a visual resource concern. Therefore implementation of the Preferred Alternative would not result in significant impacts to visual resources.

Recreation

The construction of the Main Station would potentially require the removal of the basketball courts at the site. The loss of these courts would remove a recreational area from MCAS Cherry Point; however, all other recreational areas and opportunities at the Installation would remain in place. The organized basketball leagues at MCAS Cherry Point take place at the indoor gym, and not these outdoor courts. There are no recreational activities at either of the proposed sites for the Satellite Station. Therefore, implementation of the Preferred Alternative would not result in significant impacts to recreation.

3.5 Noise

This discussion of noise includes the types or sources of noise and the associated sensitive receptors in the human environment.

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air or water, and are sensed by the human ear. Sound is all around us. The perception and evaluation of sound involves three basic physical characteristics:

- Intensity – the acoustic energy, which is expressed in terms of sound pressure, in decibels (dB)
- Frequency – the number of cycles per second the air vibrates, in Hertz (Hz)
- Duration – the length of time the sound can be detected

Noise is defined as unwanted or annoying sound that interferes with or disrupts normal human activities. Although continuous and extended exposure to high noise levels (e.g., through occupational exposure) can cause hearing loss, the principal human response to noise is annoyance. The response of different individuals to similar noise events is diverse and is influenced by the type of noise, perceived

importance of the noise, its appropriateness in the setting, time of day, type of activity during which the noise occurs, and sensitivity of the individual.

3.5.1 Basics of Sound and A-Weighted Sound Level

The loudest sounds that can be detected comfortably by the human ear have intensities that are a trillion times higher than those of sounds that can barely be detected. This vast range means that using a linear scale to represent sound intensity is not feasible. The dB is a logarithmic unit used to represent the intensity of a sound, also referred to as the sound level.

To mimic the human ear's non-linear sensitivity and perception of different frequencies of sound, the spectral content is weighted. For example, environmental noise measurements are usually on an "A-weighted" scale that filters out very low and very high frequencies in order to replicate human sensitivity. It is common to add the "A" to the measurement unit in order to identify that the measurement has been made with this filtering process (dBA).

3.5.2 Noise Metrics

A metric is a system for measuring or quantifying a particular characteristic of a subject. Since noise is a complex physical phenomenon, different noise metrics help to quantify the noise environment. The noise metric relevant to this EA is the Day-Night Average Sound Level (DNL) which is the most commonly used tool for analyzing noise generated at an airfield.

The DNL metric is the energy-averaged sound level measured over a 24-hour period, with a 10-dB penalty assigned to noise events occurring between 10 p.m. and 7 a.m. (acoustic night). DNL values are average quantities, mathematically representing the continuous sound level that would be present if all of the variations in sound level that occur over a 24-hour period were averaged to have the same total sound energy.

3.5.3 Regulatory Setting

Under the Noise Control Act of 1972, the Occupational Safety and Health Administration (OSHA) established workplace standards for noise. The minimum requirement states that constant noise exposure must not exceed 90 A-weighted decibels (dBA) over an 8-hour period. The highest allowable sound level to which workers can be constantly exposed is 115 dBA and exposure to this level must not exceed 15 minutes within an 8-hour period. The standards limit instantaneous exposure, such as impact noise, to 140 dBA. If noise levels exceed these standards, employers are required to provide hearing protection equipment that will reduce sound levels to acceptable limits.

3.5.4 Affected Environment

The predominant noise sources at MCAS Cherry Point consist of aircraft operations, both at and around the airfields. Other components such as construction, aircraft ground support equipment for maintenance purposes, and vehicle traffic produce noise, but such noise generally represents a transitory and negligible contribution to the average noise level environment.

The project locations are within the aircraft generated noise contours and range from 65 dB to 75 dB DNL, as shown in **Figure 3.5-1**.

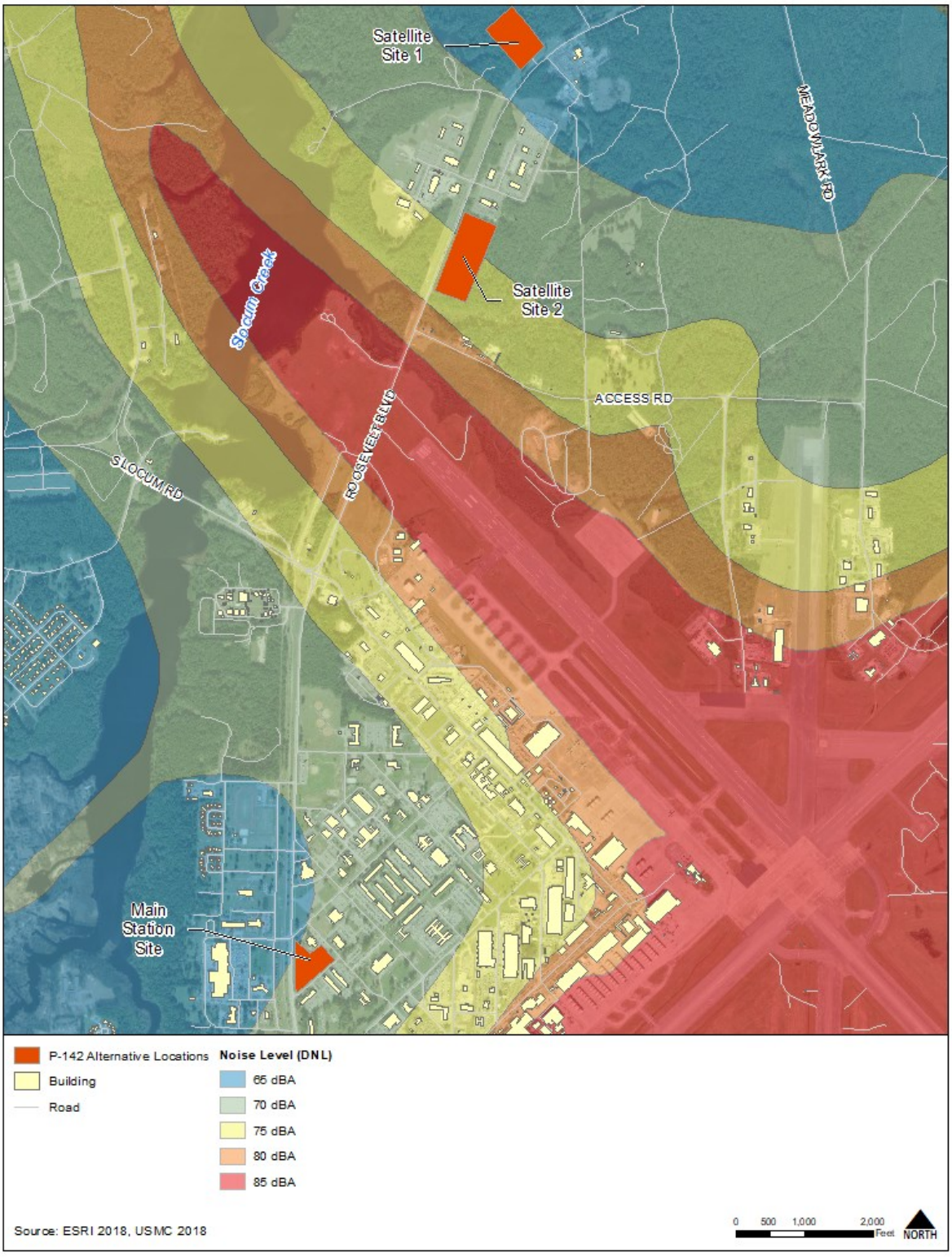

Figure 3.5-1. Existing DNL Noise Contours from Aircraft Noise at MCAS Cherry Point

The federal government supports conditions free from noise that threaten human health and welfare and the environment. Response to noise varies, depending on the type and characteristics of the noise, distance between the noise source and whoever hears it (the receptor), receptor sensitivity, and time of day. A noise sensitive receptor is defined as a land use where people involved in indoor or outdoor activities may be subject to stress or considerable interference from noise. Such locations or facilities often include residential dwellings, hospitals, nursing homes, educational facilities, and libraries. Sensitive receptors may also include noise-sensitive cultural practices, some domestic animals, or certain wildlife species.

The nearest sensitive receptors (facilities with noise sensitive uses, such as child care centers or hospitals) are approximately 100 feet away from the Proposed Main Fire Station site. BEQs are adjacent to the parcel selected for the Main Fire Station. Also near this location, approximately 500 feet northwest, is a Child Development Center (CDC) and the Naval Hospital (approximately 1,000 feet southwest). The two proposed Satellite Fire Station locations have no nearby noise sensitive receptors, with the nearest residential areas being approximately 1 mile away.

3.5.5 Environmental Consequences

Analysis of potential noise impacts includes estimating likely noise levels from the Proposed Action and determining potential effects to sensitive receptor sites.

3.5.5.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to baseline noise levels. Therefore, no significant impacts due to the noise environment would occur with implementation of the No Action Alternative.

3.5.5.2 Fire Station Construction and Demolition (Preferred Alternative)

As described in **Section 3.5.4**, only the proposed location for the Main Fire Station has sensitive noise receptors nearby (BEQs, CDC, and Naval Hospital). Using the Federal Highway Administration's Roadway Construction Noise Model, the nearest receptor (the adjacent BEQs) would experience noise levels of approximately 76 dB from construction equipment operation. The CDC and Naval Hospital would be exposed to construction noise levels of 62 dB and 55 dB, respectively. All noise impacts from construction would be temporary in nature, and would only occur during normal business hours (8:00 am to 5:00 pm). In addition, the walls of these facilities would reduce the noise experienced inside the buildings. These facilities are within the 65 and 70 db DNL contours (which is attributed to the aircraft activity at the airfield) and likely would not perceive any change in the existing noise environment during construction.

Construction of the Satellite Fire Station at either of the alternative sites would result in similar noise (76 dB). However, no sensitive receptors are located nearby, therefore noise impacts would be negligible.

Therefore implementation of the Preferred Alternative would not result in significant impacts to the noise environment.

3.6 Infrastructure

This section discusses infrastructure utilities (including drinking water production, storage, and distribution; wastewater collection treatment and disposal; storm water management, solid waste

management, energy production, transmission, and distribution; and communications). Transportation systems and traffic are addressed separately in **Section 3.7**.

3.6.1 Regulatory Setting

EO 13834, Efficient Federal Operations, requires federal departments and agencies to meet statutory requirements in a manner that increases efficiency, optimizes performance, eliminates unnecessary use of resources, and protects the environment. The goals of this EO focus on increasing building energy efficiency, renewable energy usage, reducing potable and non-potable water consumption, conforming with sustainable design principles, and implementing waste prevention/recycling measures. In accordance with this EO, the Navy must prioritize actions that reduce waste, cut costs, enhance the resilience of federal infrastructure and operations, and enable more effective accomplishment of its mission. Improved environmental performance and federal sustainability will be achieved by reducing energy use and cost. Pursuing clean sources of energy will improve energy and water security. Chief of Naval Operation Instruction 4100.5E outlines the Secretary of the Navy's vision for shore energy management. The focus of this instruction is establishing the energy goals and implementing strategy to achieve energy efficiency.

Antiterrorism Force Protection Standards have been adopted by the Department of Defense (DoD) through Instruction number 2000.16 of October 2006. The standards require all DoD Components to adopt and adhere to common criteria and minimum construction standards to mitigate antiterrorism vulnerabilities and terrorist threats.

3.6.2 Affected Environment

The following discussions provide a description of the existing conditions for each of the categories under infrastructure at MCAS Cherry Point.

3.6.2.1 Potable Water

Water is supplied to MCAS Cherry Point through 23 wells that draw water from the Castle Hayne aquifer. The 12 hour capacity total of the wells is approximately 4.0 million gallons per day (MGD). Average daily production of the water treatment plant is approximately 4.0 MGD, though it has a permitted capacity of 6.0 MGD (MCAS Cherry Point 2014).

The overall capacity of the water supply system is considered marginally adequate to support current and projected demand. The average daily demand of the water treatment plant is approaching the 12-hour water supply available from the current wells (MCAS Cherry Point 2014).

3.6.2.2 Wastewater

MCAS Cherry Point has a Waste Water Treatment Plant (WWTP) and an industrial pre-treatment waste water treatment plant (IWTP). The WWTP for domestic waste water has a treatment capacity of 6.5 MGD and a hydraulic capacity of 10 MGD. The installation's National Pollutant Discharge Elimination System (NPDES) discharge permit allows for a release of 3.5 MGD into the Neuse River, with an average daily discharge of 1.8 MGD, with normal peak flow of 3.1 MGD (MCAS Cherry Point 2014).

The IWTP is used for pre-treating industrial waste from oil-water separators, wash racks, and the Fleet Readiness Center East. The pre-treatment removes oil, heavy metals, and cyanide from the waste stream and then discharges the treated industrial effluent into the domestic WWTP. The IWTP has a

designed capacity of 630,000 gallons per day (GPD). The typical daily flow ranges from 300,000 to 450,000 GPD, dependent on the Fleet Readiness Center East operations (MCAS Cherry Point 2014).

3.6.2.3 Stormwater

The existing stormwater conveyance system at MCAS Cherry Point incorporates flat swales, open ditches, and buried pipes. There are also approximately 20 high density structural BMPs that are designed to capture and treat stormwater runoff from more recent installation improvements (i.e., buildings, parking lots, other impervious surfaces). Additionally, BMPs have been implemented to reduce or eliminate contamination of stormwater from materiel storage and refueling areas. This includes stormwater diversion of five wash racks, installation of three bio-retention cells, implementation of wetland restoration and where applicable underground infiltration galleries and infiltration trenches as part of new construction. The receiving waters for the stormwater system at MCAS Cherry Point are Slocum Creek, Hancock Creek, and the Neuse River. These waters are all classified as nutrient sensitive waters by the State of North Carolina (MCAS Cherry Point 2014).

3.6.2.4 Energy

The electrical power for MCAS Cherry Point is provided by Progress Energy by means of two substations. There is a 50 Mega-watt substation at Slocum Road and Roosevelt Boulevard and a 25 Mega-watt substation on North Carolina Highway 101. The 25 Mega-watt station is near capacity and any substantial increase in demand would require an upgrade of this facility (MCAS Cherry Point 2014).

Facilities at MCAS Cherry Point and the surrounding areas operate under a 42 Mega-watt peak load. The electrical system is monitored through the Utility Monitoring and Control System. There are no specific areas of the installation that are particularly stressed during times of high demand. If necessary, during times of uncommonly high demand, capacity can be diverted from low priority areas. There have also been a number of recent upgrades to the electrical system to help with periods nearing peak capacity (MCAS Cherry Point 2014).

3.6.2.5 Solid Waste Management

Solid waste generated at MCAS Cherry Point is collected by the installation and deposited to a transfer station before being transported to the Tuscarora Long Term Regional Landfill, operated by the Coastal Regional Solid Waste Management Authority (CRSWMA). This landfill opened in 1999 and was recently granted a permit of operation through 2032 (Permit No. 2509-MSWLF-1999). In 2019, NC DEQ's Landfill Capacity Report stated that there was approximately 8 million cubic yards or remaining permitted volume left at the landfill. NC DEQ's report estimated that for total permitted volume remaining the landfill could remain operational for 27.4 more years (NCDEQ 2019). The Tuscarora Long Term Regional Landfill is also the permitted construction and demolition debris facility for Craven County.

3.6.2.6 Communications

The existing telecommunications network runs along Roosevelt Road with branches extending out to individual facilities. The proposed Main Station and Satellite locations are along the existing communications network.

3.6.3 Environmental Consequences

This section analyzes the magnitude of anticipated increases or decreases in public works infrastructure demands considering historic levels, existing management practices, and storage capacity, and evaluates

potential impacts to public works infrastructure associated with implementation of the alternatives. Impacts are evaluated by whether they would result in the use of a substantial proportion of the remaining system capacity, reach or exceed the current capacity of the system, or require development of facilities and sources beyond those existing or currently planned.

3.6.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to the existing infrastructure. Therefore, no significant impacts to infrastructure would occur with implementation of the No Action Alternative.

3.6.3.2 Fire Station Construction and Demolition (Preferred Alternative)

Construction and demolition would have only minor impacts to the infrastructure and utilities at MCAS Cherry Point. While these facilities would introduce new connections for potable water, waste water, telecommunications and power, the size of the facilities and required demand from these utilities would not create capacity concerns given the information available at this time. In addition, the utility connections at the existing stations would be disconnected and demolished. Any new impervious surface would be included in stormwater management BMPs as the fire station design progresses. All stormwater management would be in accordance with MCAS Cherry Point's Stormwater Pollution Prevention Plan. During construction, the contractor would also be required to follow a site specific erosion and sediment control plan developed prior to construction activities.

The new fire stations would not generate an inordinate quantity of solid waste. Therefore, there would be no impacts to solid waste management at MCAS Cherry Point. Debris from demolition of the existing fire stations would be taken to the Tuscarora Long Term Regional Landfill which is approved for construction and demolition debris. There would be no issues with capacity from the demolition of these relatively small buildings.

Therefore, implementation of the Preferred Alternative would not result in significant impacts to infrastructure or utilities.

3.7 Traffic and Transportation

Transportation includes all of the air, land, and sea routes with the means of moving passengers and goods. A transportation system can consist of any or all of the following: roadways, bus routes, railways, subways, bikeways, trails, waterways, airports, and taxis, and can be looked at on a local or regional scale.

Traffic is commonly measured through average daily traffic and design capacity. These two measures are used to assign a roadway with a corresponding level of service (LOS). The LOS designation is a professional industry standard used to describe the operating conditions of a roadway segment or intersection. The LOS is defined on a scale of A to F that describes the range of operating conditions on a particular type of roadway facility. LOS A through LOS B indicates free flow travel. LOS C indicates stable traffic flow. LOS D indicates the beginning of traffic congestion. LOS E indicates the nearing of traffic breakdown conditions. LOS F indicates stop-and-go traffic conditions and represents unacceptable congestion and delay.

3.7.1 Regulatory Setting

EO 13834 encourages government entities to improve building efficiency, performance, and management by including in the planning for new buildings or leases, cost-effective strategies to optimize sustainable space usage and consideration of existing community transportation planning and infrastructure, including access to public transit. This EO encourages the coordination of federal real property discussions with local communities in an effort to encourage planned transportation investments that aim to support public transit access.

Additionally, as stated in Chapters 1 and 2, a number of MCOs, DoD, and UFC standards exist for fire station requirements and location. These specific regulations are as follows:

- MCO 11000.11A, Marine Corps Fire Protection and Emergency Services Program;
- USACE State Fire Station Design Manual
- UFC 2-000-05N Facility Planning Criteria for Navy/Marine Corps Shore Installations; and
- DoD Manual 6055.06, Fire and Emergency Services Certification Program; and
- DoDI 6055.06, DoD Fire and Emergency Services Program.

From these documents, two major points emerge for fire station facilities: 1) large enough to accommodate modern facilities and equipment; and 2) located to meet response time requirements to all areas of responsibility at the Air Station.

3.7.2 Affected Environment

Access to MCAS Cherry Point is provided through four entry control points (ECPs). These are the Roosevelt, Cunningham, Slocum, and Catawba gates. The Roosevelt ECP operates 24 hours per day, seven days a week. The other three ECPs operate on more limited schedules. The Cunningham gate operates during peak traffic times on weekdays to alleviate inbound and outbound traffic, but because it is located within an airfield runway clear zone, it is otherwise closed (MCAS Cherry Point 2013).

MCAS Cherry Point is generally laid out in a grid network of roadways within the western quadrant of the runways. Roosevelt Boulevard is the major north-south arterial through the air station. Housing and support services are generally on the west side of Roosevelt Boulevard, while bachelor housing, administrative, training, and maintenance facilities are generally on the east side, nearer the airfield. Most roads on the air station have one travel lane in each direction. Intersections are generally STOP controlled or signalized. Speed limits are 20 miles per hour (mph) for many roads, and up to 45 mph for arterials (MCAS Cherry Point 2013).

The existing fire station locations are shown in **Figure 3.7-1**. The existing Main station services the southern fire district while the existing Satellite Station services the northern fire district.

3.7.3 Environmental Consequences

Impacts to ground traffic and transportation are analyzed by considering the possible changes to existing traffic conditions and the capacity of area roadways from proposed increases in commuter and construction traffic.

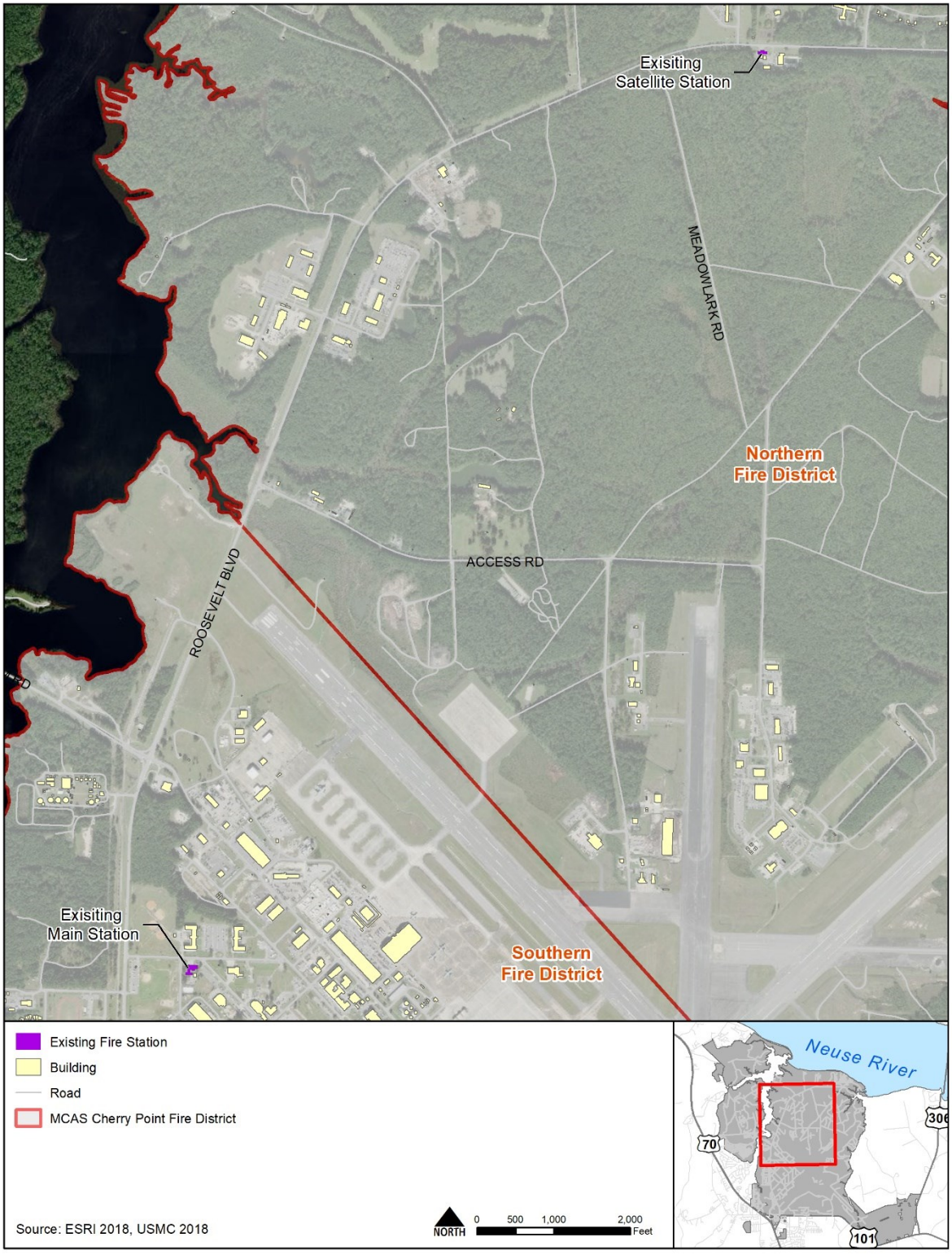

Figure 3.7-1. Existing Fire Stations at MCAS Cherry Point

3.7.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to transportation. Therefore, no significant impacts would occur with implementation of the No Action Alternative.

3.7.3.2 Fire Station Construction and Demolition (Preferred Alternative)

During construction there would be minor disturbances to traffic flow from the entrance and exit of construction related equipment and materials to the proposed fire station construction sites. This would likely cause increased traffic related issues at the proposed main station location since this location is nearer to the main portion of MCAS Cherry Point. Traffic use of Roosevelt Boulevard would be heavier at this location than the two Satellite locations located further north. All traffic related issues from construction would be temporary in nature and would not lead to permanent increases in traffic congestion or impede traffic flow in the long term.

Demolition of the existing fire stations would similarly create temporary impacts to traffic from heavy equipment delivery and the movement of debris off the air station. These impacts would be temporary in nature and would not produce long term impedance to traffic flow on MCAS Cherry Point.

Additionally, new roadway entry points and potentially emergency signalization of these entry points may occur from the Proposed Action. This would allow quicker access to the major roadway network. If new traffic patterns were deemed necessary during the design phase of the fire station planning, they would also be implemented to potentially increase emergency vehicle access to the road network, and decrease the response time.

Estimated response times were generated using the Service Area Tool in ArcGIS Pro 2.4.2. This tool uses the individual proposed fire station locations and the MCAS Cherry Point provided road centerline feature class to develop potential response times for areas within the road network. For this analysis, the road network extends off of MCAS Cherry Point. These areas were removed from analysis, since the Main Station and Satellite Fire Station locations would be required to respond to incidents within the Main Station area and not off base. The Service Area Tool generated polygons of varying response times, in this case 4, 6, 8, 10, and 12 minute intervals. Parameters were set for “emergency vehicle” to develop the Service Areas shown on **Figures 3.7-2, 3.7-3, and 3.7-4**, which remove the requirement to stop at signalized intersections, therefore decreasing the time it takes to travel to a location.

The proposed locations of the fire stations would allow for the MCAS Cherry Point Fire Department to access most of the base within 12 minutes, using the existing road networks.

Therefore, implementation of the Preferred Alternative would not result in significant impacts to transportation or traffic flow.

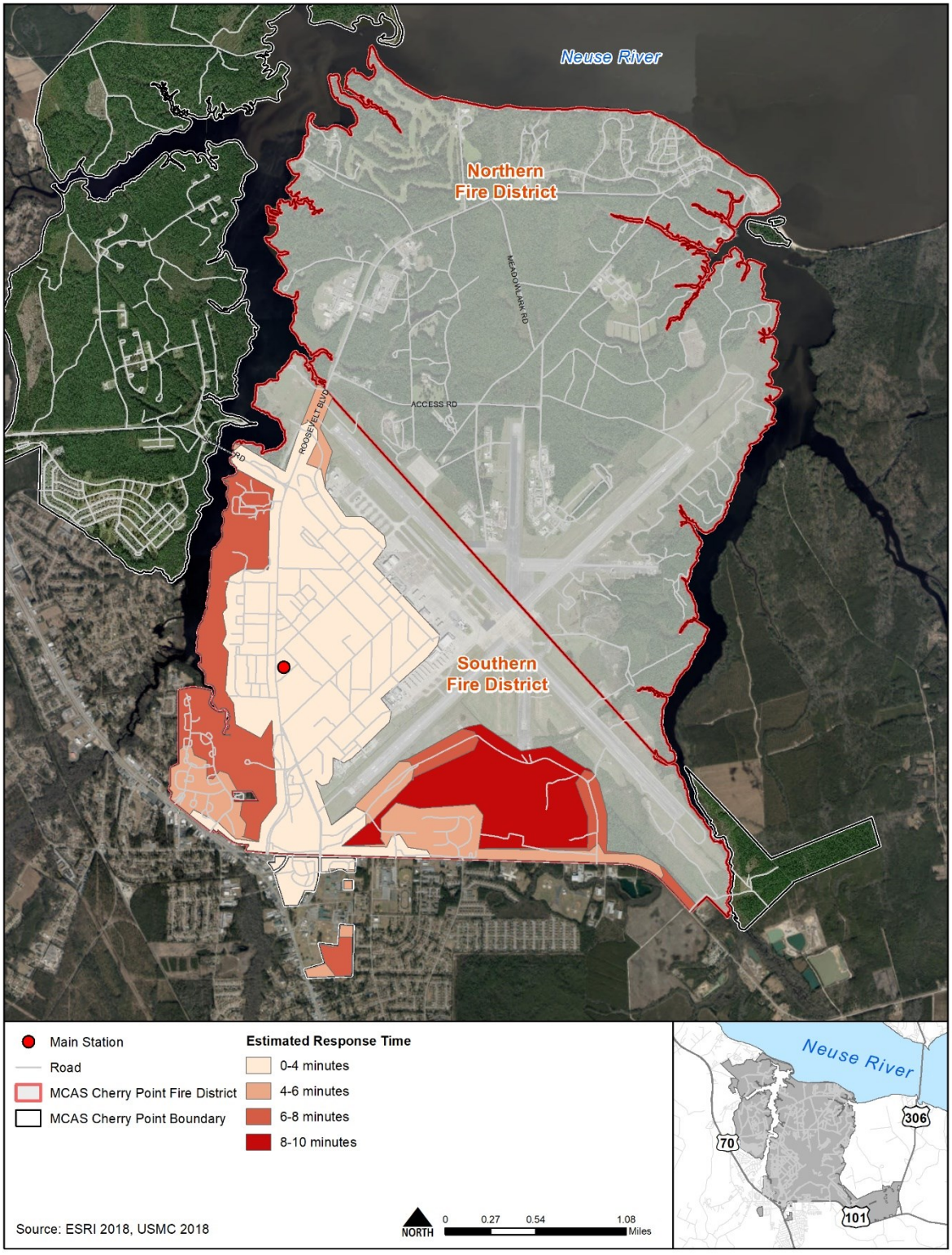

Figure 3.7-2. Response Time for Proposed Main Station

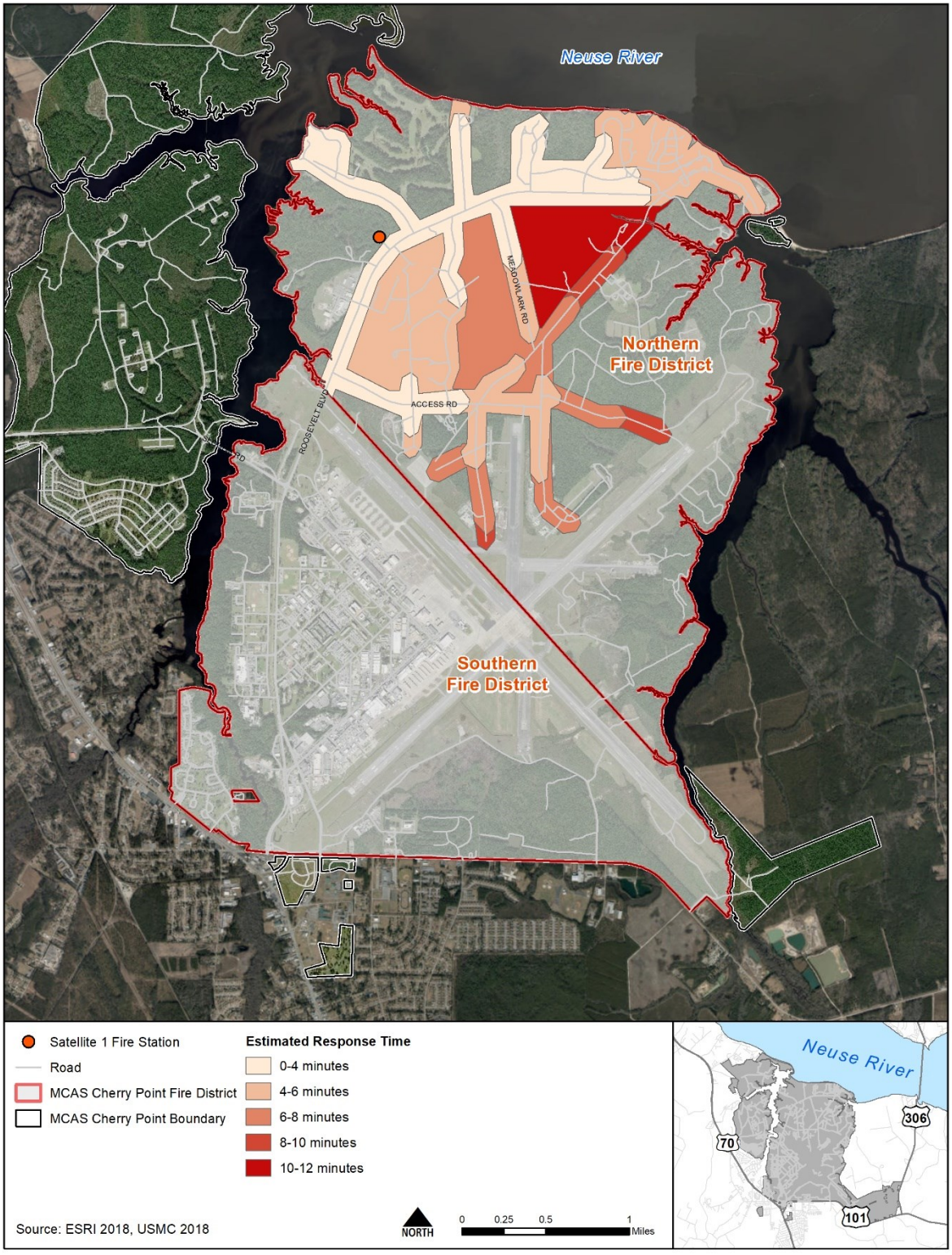

Figure 3.7-3. Response Time for Proposed Satellite Station, Site 1

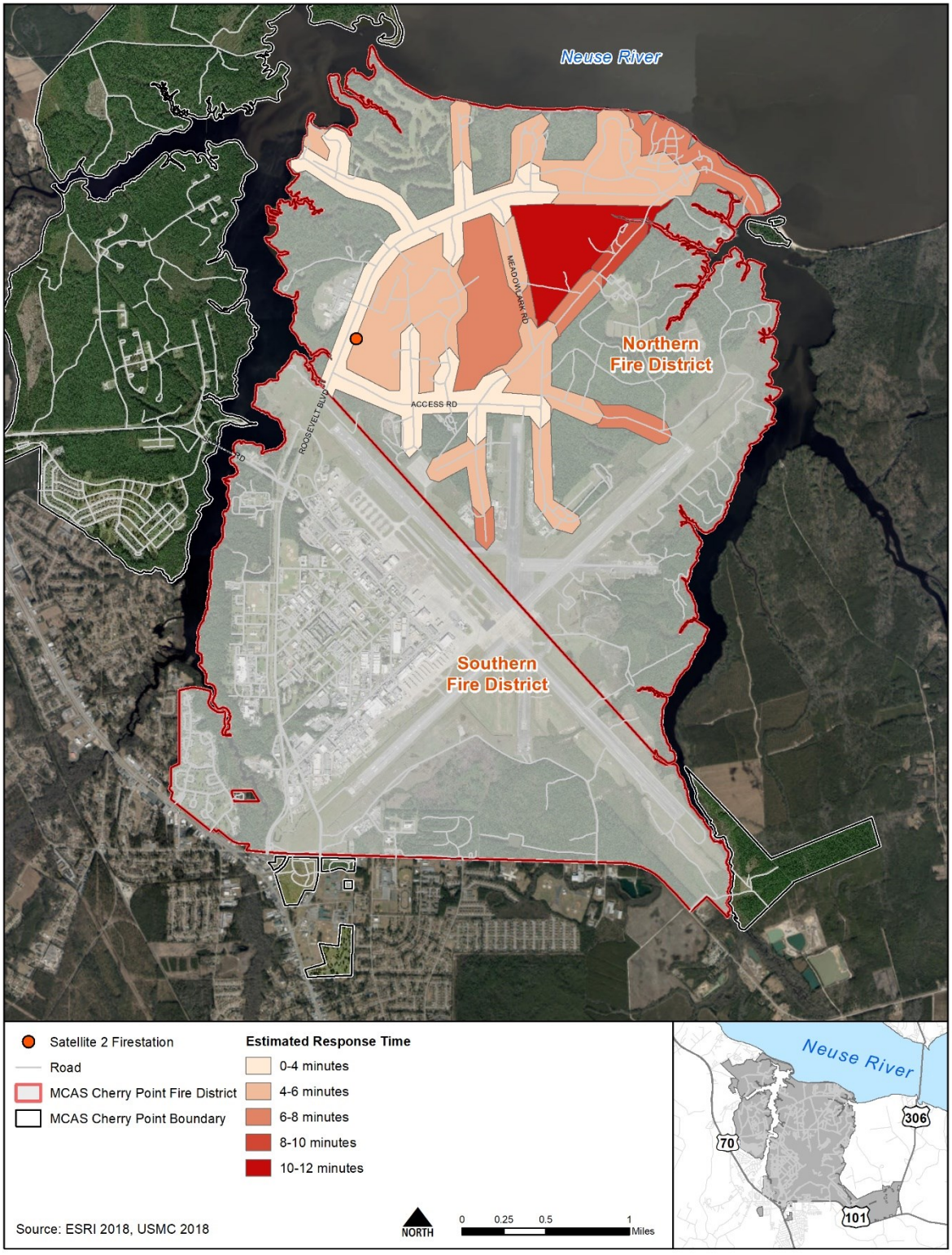

Figure 3.7-4. Response Time for Proposed Satellite Station, Site 2

3.8 Public Heath and Safety

This discussion of public health and safety includes consideration for any activities, occurrences, or operations that have the potential to affect the safety, well-being, or health of members of the public. A safe environment is one in which there is no, or optimally reduced, potential for death, serious bodily injury or illness, or property damage. The primary goal is to identify and prevent potential accidents or impacts on the general public. Public health and safety within this EA discusses information pertaining to community emergency services, construction activities, operations, and environmental health and safety risks to children.

Community emergency services are organizations which ensure public safety and health by addressing different emergencies. The three main emergency service functions include police, fire and rescue service, and emergency medical service.

Public health and safety during construction, demolition, and renovation activities is generally associated with construction traffic, as well as the safety of personnel within or adjacent to the construction zones.

Operational safety may refer to the actual use of the facility or built-out proposed project, or training or testing activities and potential risks to inhabitants or users of adjacent or nearby land and water parcels. Safety measures are often implemented through designated safety zones, warning areas, or other types of designations.

Environmental health and safety risks to children are defined as those that are attributable to products or substances a child is likely to come into contact with or ingest, such as air, food, water, soil, and products that children use or to which they are exposed.

3.8.1 Regulatory Setting

Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, requires federal agencies to "make it a high priority to identify and assess environmental health and safety risks that may disproportionately affect children and shall ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks."

Procedures and guidelines for emergency services at Marine Corps installations are implemented through MCO 11000.11A *Marine Corps Fire Protection and Emergency Services Program.* The order "provides policy to prevent and protect Marine Corps personnel and the public from loss of life, injury and illness due to fires and other emergencies as a result of installation and expeditionary activities, aircraft operations, disasters or terrorist incidents. This Order also encourages measures to prevent or minimize damage to Marine Corps property and the environment."

3.8.2 Affected Environment

Currently, the fire stations at MCAS Cherry Point (Buildings 192 and 193) do not provide adequate living facilities for personnel. The intent of the Proposed Action is to provide fire station facilities that are located to provide adequate response times to all areas of MCAS Cherry Point, safe and healthy living environment for personnel who occupy the facilities, and proper storage for vehicles and equipment.

3.8.3 Environmental Consequences

The safety and environmental health analysis addresses issues related to the health and well-being of military personnel and civilians living on or in the vicinity of MCAS Cherry Point. Specifically, this section provides information on hazards associated with demoltion and construction associated with the Main Station and Satellite Station. Additionally, this section addresses the environmental health and safety risks to children.

3.8.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur. The current fire stations do not provide adequate living conditions for fire and emergency services personnel; therefore, the No Action Alternative could create a long-term negative impact to public health and safety for fire and emergency services personnel at MCAS Cherry Point. However, the impact would not be considered significant.

3.8.3.2 Fire Station Construction and Demolition (Preferred Alternative)

During construction and demolition, contractors would be required to wear proper personal protective equipment such as hard hats, gloves, steel toed boots, eye protection, and long pants/long sleeve shirts as necessary, and safe equipment operation procedures would be followed. Construction and demolition activities occurring at MCAS Cherry Point are required to be conducted in a manner that is consistent with all federal regulations, including all applicable Occupational Safety and Health Administration and Marine Corps requirements.

Operations at the Main Station and Satellite Station would proceed in a safe manner in accordance with the Marine Corps Fire Protection and Emergency Services Program (MCO 11000.11A).The Marine Corps has determined that there are no environmental health and safety risks associated with the Proposed Action that would disproportionately affect children.

Therefore, implementation of the Preferred Alternative would not result in significant impacts to public health and safety.

3.9 Summary of Potential Impacts to Resources and Impact Avoidance and Minimization

A summary of the potential impacts associated with each of the action alternatives and the No Action Alternative is presented in **Table 3.9-1**. There are no anticipated significant impacts; therefore, there are no mitigation measures for this action.

Table 3.9-1. Summary of Potential Impacts to Resource Areas

Resource Area	No Action Alternative	Fire Station Construction and Demolition (Preferred Alternative)
Air Quality	The No Action Alternative would have no significant impacts to air quality.	• The emissions associated with construction and demolition would be temporary and localized. • Estimated emissions would not exceed any of the comparative thresholds. • The emissions would contribute directly to emission of GHGs from combustion of fossil fuels.
Cultural Resources	The No Action Alternative would have no significant impacts to cultural resources.	• No archaeological resources would be impacted by the proposed demolition of the existing Main or Satellite Stations, nor the construction of the Main Station or Satellite Station at Site 1. The proposed Satellite Station Site 2 has not been previously surveyed or disturbed. If this site is selected MCAS Cherry Point would determine the presence of National Register of Historic Places eligible archaeological resources through consultation with the North Carolina SHPO and complete appropriate archaeological investigations • No architectural resources are considered eligible for listing in the NRHP at the existing Main or Satellite Station Sites or the proposed Main or Satellite Station Sites 1 or 2 or at the Main Station Site. • No known traditional cultural properties have been identified at MCAS Cherry Point.
Biological Resources	The No Action Alternative would have no significant impacts to biological resources.	• The proposed demolition of the existing Main and Satellite Fire Stations is not expected to affect natural vegetation or wildlife. • The proposed construction of the Main Fire Station would occur in a previously disturbed area that supports no native vegetation or wildlife. • The proposed construction of the Satellite Station at either Site 1 or 2 would remove small areas of natural vegetation. The impacts to wildlife would be minimal.
Visual Resources and Recreation	The No Action Alternative would have no significant impacts to visual resources and recreation.	• The proposed Main and Satellite Stations would have similar design and character as the rest of the cantonment area and there would be no impact to visual resources. • The existing basketball courts at the proposed site for the Main Station would be removed; however, there would be no impact to recreation activities at the installation.
Noise	The No Action Alternative would have no significant impacts to the noise environment.	• Under the Proposed Action, there would be short-term and temporary noise generated by construction and demolition equipment and activities. • The predominate noise source at MCAS Cherry Point is from aircraft operations and it is expected that the temporary construction noise would not be perceptible.
Infrastructure	The No Action Alternative would have no significant impacts to infrastructure.	• Construction and demolition, under the Proposed Action, would have only minor impacts to the infrastructure and utilities at MCAS Cherry Point. • While these facilities would introduce new connections for potable water, wastewater, and power, the size of the facilities and required demand from these utilities would not create capacity concerns.

Table 3.9-1. Summary of Potential Impacts to Resource Areas

Resource Area	No Action Alternative	Fire Station Construction and Demolition (Preferred Alternative)
		• During construction, the contractor would be required to follow stormwater best management practices (BMPs), a Stormwater Pollution Prevention Plan and a site-specific erosion and sediment control plan. • The new fire stations are not anticipated to generate an inordinate quantity of solid waste. Debris from the demolition process will be taken to an approved construction and demolition debris land fill in accordance with required laws and regulations.
Traffic and Transportation	The No Action Alternative would have no significant impacts to traffic and transportation.	• During construction, vehicles and equipment would cause minor disturbances to traffic flow. • The disturbance to traffic flow would be greater at the proposed Main Station site given its location near the main portion of MCAS Cherry Point.
Public Health and Safety	The No Action Alternative would have no significant impacts to public health and safety.	• During construction at the Proposed Action sites, Occupational Safety and Health Act regulations, procedures, and anti-terrorism/force protection requirements would be followed; therefore, no significant impacts to public health or safety are anticipated. • There are no environmental health or safety risks associated with the Proposed Action that would disproportionately affect children.

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4 Cumulative Impacts

This section (1) defines cumulative impacts, (2) describes past, present, and reasonably foreseeable future actions relevant to cumulative impacts, (3) analyzes the incremental interaction the proposed action may have with other actions, and (4) evaluates cumulative impacts potentially resulting from these interactions.

4.1 Definition of Cumulative Impacts

The approach taken in the analysis of cumulative impacts follows the objectives of the NEPA, CEQ regulations, and CEQ guidance. Cumulative impacts are defined in 40 CFR section 1508.7 as "the impact on the environment that results from the incremental impact of the action when added to the other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

To determine the scope of environmental impact analyses, agencies shall consider cumulative actions, which when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same impact analysis document.

In addition, CEQ and USEPA have published guidance addressing implementation of cumulative impact analyses—Guidance on the Consideration of Past Actions in Cumulative Effects Analysis (CEQ 2005) and Consideration of Cumulative Impacts in EPA Review of NEPA Documents (USEPA 1999). CEQ guidance entitled *Considering Cumulative Impacts Under NEPA* (1997) states that cumulative impact analyses should

"…determine the magnitude and significance of the environmental consequences of the proposed action in the context of the cumulative impacts of other past, present, and future actions...identify significant cumulative impacts…[and]…focus on truly meaningful impacts."

Cumulative impacts are most likely to arise when a relationship or synergism exists between a proposed action and other actions expected to occur in a similar location or during a similar time period. Actions overlapping with or in close proximity to the proposed action would be expected to have more potential for a relationship than those more geographically separated. Similarly, relatively concurrent actions would tend to offer a higher potential for cumulative impacts. To identify cumulative impacts, the analysis needs to address the following three fundamental questions.

- 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?

4.2 Scope of Cumulative Impacts Analysis

The scope of the cumulative impacts analysis involves both the geographic extent of the effects and the time frame in which the effects could be expected to occur. For this EA, the study area delimits the

geographic extent of the cumulative impacts analysis. In general, the study area will include those areas previously identified in Chapter 3 for the respective resource areas. The time frame for cumulative impacts centers on the timing of the proposed action.

Another factor influencing the scope of cumulative impacts analysis involves identifying other actions to consider. Beyond determining that the geographic scope and time frame for the actions interrelate to the proposed action, the analysis employs the measure of "reasonably foreseeable" to include or exclude other actions. For the purposes of this analysis, public documents prepared by federal, state, and local government agencies form the primary sources of information regarding reasonably foreseeable actions. Documents used to identify other actions include notices of intent for Environmental Impact Statements (EIS) and EAs, management plans, land use plans, and other planning related studies.

4.3 Past, Present, and Resasonably Foreseeable Actions

This section will focus on past, present, and reasonably foreseeable future projects at and near the Proposed Action locale. In determining which projects to include in the cumulative impacts analysis, a preliminary determination was made regarding the past, present, or reasonably foreseeable action. Specifically, using the first fundamental question included in Section 4.1, it was determined if a relationship exists such that the affected resource areas of the Proposed Action included in this EA might interact with the affected resource area of a past, present, or reasonably foreseeable action. If no such potential relationship exists, the project was not carried forward into the cumulative impacts analysis. In accordance with CEQ guidance (CEQ 2005), these actions considered but excluded from further cumulative effects analysis are not catalogued here as the intent is to focus the analysis on the meaningful actions relevant to informed decision-making.

4.3.1 Past Actions

Grow the Force in North Carolina. The Marine Corps prepared an EIS in December 2009 to evaluate the environmental impacts associated with an increase in 9,900 Marine Corps and civilian personnel at Marine Corps Base Camp Lejeune, MCAS New River, and MCAS Cherry Point. Also analyzed was the construction of new infrastructure and demolition and upgrades to existing infrastructure to support the staff increases. No significant impacts to resources from the addition of personnel and construction of associated facilities at MCAS Cherry Point were identified. A Record of Decision for the action was published on February 2, 2010 (Federal Register / Vol. 75, No. 21). All construction projects at MCAS Cherry Point associated with the Grow the Force action are currently complete; therefore, there would be no temporal overlap with the construction proposed in this EA.

Basing the U.S. Marine Corps F-35 on the East Coast. The U.S. DoN prepared an EIS in May 2010 to evaluate the environmental impacts associated with basing of three F-35 operational squadrons and the Pilot Training Center at MCAS Beaufort in Beaufort, South Carolina, and eight operational squadrons at MCAS Cherry Point (U.S. DoN 2010b). To support the basing action, the proposed action included: construction and renovation of airfield facilities and infrastructure necessary to accommodate and maintain the F-35 squadrons; changes to personnel to accommodate squadron staffing; and required F-35 training operations. The F-35 aircraft replace legacy Marine Corps F/A- 18A/B/C/D Hornet and AV-8B Harrier aircraft. The EIS determined that there would be no significant, immitigable impacts at MCAS Cherry Point. A Record of Decision for the action was published on December 15, 2010 (Federal Register /Vol. 75, No. 240).

Fleet Readiness Center East Facilities Improvements in Support of F-35 Depot Capability Establishment. The U.S. DoN prepared an EA in June 2013 to evaluate the environmental impacts associated with establishing depot-level maintenance capabilities for the F-35 aircraft at Fleet Readiness Center East at MCAS Cherry Point. Construction of new facilities and modification of an existing facility were considered. The analysis indicated there would be no significant impact to resources associated with the proposed construction of new facilities and modification of an existing facility in support of establishing the Fleet readiness Center.

4.3.2 Present and Reasonably Foreseeable Actions

U.S. 70, Havelock Bypass. In December 2016, a Record of Decision was signed by the Department of Transportation, Federal Highway Administration for the construction of a 10.3-mile four-lane divided bypass around the southwest side of the City of Havelock and MCAS Cherry Point (Federal Highway Administration 2016). The EIS concluded that there would be impacts from change in land use, impacts to community facilities from displacement of the Craven County Waste Transfer facility, water quality impacts from increased stormwater runoff, localized increases in noise from traffic, fragmentation of some plant communities, and impacts to wetlands. Construction is to be completed in 2021 (Federal Highway Administration 2015). There would be a temporal overlap with the construction under the preferred alternative analyzed in this EA.

Roadway Improvements in Support of Flightline Utilities Modernization. The Marine Corps prepared an EA in May of 2017 to evaluate the environmental impacts of making improvements to 5th Avenue and C Street and creating temporary parking areas to ensure these streets could accept the volume of traffic diverted from 6th Avenue and A Street during the flightline utilities modernization project with minimal impact to traffic flow and that adequate parking would be available to offset parking area closures (Department of the Navy 2017). The proposed roadway improvements would be implemented in two phases. Phase 1 would: establish temporary parking area(s); extend 5th Avenue at the northwest and southeast terminus points; and widen C Street. Phase 2 would: establish permanent replacement asphalt parking areas; and remove the temporary parking areas. Facility demolition would be required in some areas. Phase 1 of the project began in FY 2019 and Phase 2 will begin in FY 2021 with each phase requiring approximately two years. The EA concluded there would be minor to negligible adverse impacts during construction and positive impacts to traffic and transportation.

4.4 Cumulative Impact Analysis

Where feasible, the cumulative impacts were assessed using quantifiable data; however, for many of the resources included for analysis, quantifiable data is not available and a qualitative analysis was undertaken. In addition, where an analysis of potential environmental effects for future actions has not been completed, assumptions were made regarding cumulative impacts related to this EA/EIS where possible. The analytical methodology presented in Chapter 4, which was used to determine potential impacts to the various resources analyzed in this document, was also used to determine cumulative impacts.

Where feasible, the cumulative impacts were assessed using quantifiable data; however, for many of the resources included for analysis, quantifiable data is not available and a qualitative analysis was undertaken. In addition, where an analysis of potential environmental effects for future actions has not been completed, assumptions were made regarding cumulative impacts related to this EA/EIS where possible. The analytical methodology presented in Chapter 3, which was used to determine potential

impacts to the various resources analyzed in this document, was also used to determine cumulative impacts.

4.4.1 Air Quality

4.4.1.1 Description of Geographic Study Area

The study area for cumulative air quality impacts is the county within which the project would occur, Craven County. Past, present, and future actions have the potential to cumulatively increase the criteria air pollutants within the county.

4.4.1.2 Relevant Past, Present, and Future Actions

The air emissions associated with past projects described in Section 4.3.1 were temporary during construction and demolition of those facilities and improvements and would not interact with the proposed action. There is a temporal overlap in the proposed construction and demolition of the fire stations with the U.S. 70 Bypass project and the roadway improvements along 5th Avenue and C Street described in Section 4.3.2.

4.4.1.3 Cumulative Impact Analysis

The proposed U.S. 70 Bypass project did not include construction of any facilities, nor did the analysis calculate the construction emissions for the highway since the action would occur within an attainment area. The analysis for the Bypass focused on the potential for the project to increase Mobile Source Air Toxics from traffic. The analysis did not predict higher levels of Mobile Source Air Toxics since the project would improve the operation of an existing highway making travel more efficient.

The last year of construction for the roadway improvements along 5th Avenue and C Street as defined in the EA is 2020. It is unlikely that the construction and demolition of the fire stations would occur within that same year, however, as a worst-case scenario the anticipated emissions from that project are included in this cumulative analysis. As shown in **Table 4.4-1**, the cumulative emissions from these projects would not be significant. Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects, would not result in significant impacts within the ROI.

Table 4.4-1. Cumulative Analysis for Air Quality

Summary	VOC tpy	CO tpy	NOx tpy	SO_2 tpy	PM_{10} tpy	$PM_{2.5}$ tpy	CO_2 MT/yr
Roadway Improvements (construction year 2020)[1]	2.16	6.84	19.53	0.33	19.09	2.90	1,863
Proposed Action	0.3	1.0	1.4	0.6	2.6	0.4	229
Cumulative Emissions	2.46	7.84	20.93	0.93	21.69	3.30	2,092
Comparative Threshold	250	250	250	250	250	250	25,000
Exceed Threshold?	No	No	No	No	No	No	No

Source: [1] Department of the Navy 2017.

4.4.2 Cultural Resources

4.4.2.1 Description of Geographic Study Area

The study area for cumulative impacts for cultural resources would be the APEs for the Proposed Action components (existing and proposed fire station sites).

4.4.2.2 Relevant Past, Present, and Future Actions

None of the projects listed in Section 4.3.1 or 4.3.2 would have the potential to contribute to cumulative impacts to cultural resources within the APEs for this action. If any cultural resource impacts were identified for those actions at other sites within or outside the installation, they would have been appropriately consulted and mitigated with regulatory agencies.

4.4.2.3 Cumulative Impact Analysis

The Preferred Alternative is not expected to have significant impacts to cultural resources; therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects, would not result in significant impacts within the ROI.

4.4.3 Biological Resources

4.4.3.1 Description of Geographic Study Area

The study area for cumulative impacts to biological resources would be the installation, with a focus on the areas proposed for site clearance.

4.4.3.2 Relevant Past, Present, and Future Actions

The potential impact to wildlife and vegetation from past construction activities has already occurred and likely included removal of some areas of natural habitat. The roadway improvement project would overlap temporally with the Proposed Action.

4.4.3.3 Cumulative Impact Analysis

The roadway improvement project is concentrated within the flightline and cantonment area, which is heavily disturbed with little natural habitat. This action anticipated the removal of approximately 6 acres of pine forest for a parking area. Similar to the Proposed Action, the impact to wildlife would be minimal. There is substantial, undeveloped pine forests within the installation that provides wildlife habitat. Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects, would not result in significant impacts within the ROI.

4.4.4 Visual Resources and Recreation

4.4.4.1 Description of Geographic Study Area

The study area for cumulative impacts to visual and recreation resources would be the sites proposed for the new fire stations.

4.4.4.2 Relevant Past, Present, and Future Actions

None of the projects described in Section 4.3.1 and 4.3.2 would have a cumulative interaction with the Preferred Alternative.

4.4.4.3 Cumulative Impact Analysis

None of the past, present, or future actions would overlap geographically with the Preferred Alternative. Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects, would not result in significant impacts within the ROI.

4.4.5 Noise

4.4.5.1 Description of Geographic Study Area

The study area for cumulative noise impacts would be the sites proposed for the new fire stations.

4.4.5.2 Relevant Past, Present, and Future Actions

None of the projects described in Section 4.3.1 and 4.3.2 would have a cumulative interaction with the Preferred Alternative with respect to noise. The construction noise associated with those actions would also be temporary, localized, and in general masked by the aircraft noise at the installation.

4.4.5.3 Cumulative Impact Analysis

The noise associated with the Preferred Alternative would be temporary and not create a permanent noise source. Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects, would not result in significant impacts within the ROI.

4.4.6 Infrastructure and Utilities

4.4.6.1 Description of Geographic Study Area

The study area for cumulative infrastructure and utilities impacts would be the installation.

4.4.6.2 Relevant Past, Present, and Future Actions

The construction projects associated with past actions described in Section 4.3.1 and the roadway improvements associated with flight line utilities modernization would have the potential for cumulative impacts.

4.4.6.3 Cumulative Impact Analysis

The impacts to utilities and infrastructure associated with projects in past actions are included in the existing environment for this action. The completion of the utilities modernization project at the flightline would continue to support sustainability efforts at the installation. Moving the Main Fire Station and the Satellite Station would allow for new, modern facilities to be constructed that would include more efficient energy and utility systems. The Preferred Alternative would not exceed the current capacity of water, energy, and communication systems, nor would they monopolize a significant portion of the remaining capacity. Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects, would not result in significant impacts within the ROI.

4.4.7 Traffic and Transportation

4.4.7.1 Description of Geographic Study Area

The study area for cumulative traffic and transportation impacts would be the installation.

4.4.7.2 Relevant Past, Present, and Future Actions

All of the projects described in Section 4.3.1 and 4.3.2 have the potential to cumulatively interact for transportation impacts.

4.4.7.3 Cumulative Impact Analysis

Cumulative transportation impacts from past, present, and future actions within the ROI would be less than significant because all of the actions have included improvements to transportation and congestion within the installation. The personnel increases associated with past actions (Grow the Force, F-35 Beddown, and Fleet Readiness Center East) were accounted for through various infrastructure improvements. The present and future actions (US 70 Bypass and Flightline Modernization) would continue to improve the flow of traffic within the installation and access to the main gates. Relocating the Main and Satellite Fire Stations would not have significant impacts to traffic flow on the installation. Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects, would not result in significant impacts within the ROI.

4.4.8 Public Health and Safety

4.4.8.1 Description of Geographic Study Area

The study area for cumulative public health and safety impacts would be the installation.

4.4.8.2 Relevant Past, Present, and Future Actions

The flightline modernization project has the potential to overlap temporally with the proposed action.

4.4.8.3 Cumulative Impact Analysis

The construction timelines for the Proposed Action and the flightline modernization project could potentially overlap. Each construction project would be required to adhere to all safety requirements and guidelines to ensure protection of personnel on the site and bystanders. Neither of these projects represents unique situations or an increased safety risk. There are no significant impacts to public health and safety expected from either of these projects. Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects, would not result in significant impacts within the ROI.

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5 Other Considerations Required by NEPA

5.1 Consistency with Other Federal, State, and Local Laws, Plans, Policies, and Regulations

In accordance with 40 CFR 1502.16(c), analysis of environmental consequences shall include discussion of possible conflicts between the Proposed Action and the objectives of federal, regional, state and local land use plans, policies, and controls. **Table 5.1-1** identifies the principal federal and state laws and regulations that are applicable to the Proposed Action and describes briefly how compliance with these laws and regulations would be accomplished.

Table 5.1-1. Principal Federal and State Laws Applicable to the Proposed Action

Federal, State, Local, and Regional Land Use Plans, Policies, and Controls	Status of Compliance
National Environmental Policy Act (NEPA); CEQ NEPA implementing regulations; Navy procedures for Implementing NEPA; MCO 5090.2, Volume 12, Environmental Planning and Review	Completion of EA will document compliance
Clean Air Act	Completion of EA will document compliance
Clean Water Act	Completion of EA will document compliance
Coastal Zone Management Act	n/a
National Historic Preservation Act	If Satellite Station Site 2 is selected, additional compliance required
Endangered Species Act	Completion of EA will document compliance
Migratory Bird Treaty Act (MBTA; 16 U.S.C. sections 703–712)	Completion of EA will document compliance
Executive Order 11988, Floodplain Management	Completion of EA will document compliance
Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks	Completion of EA will document compliance
Executive Order 13186, Responsibility of Federal Agencies to Protect Migratory Birds	Completion of EA will document compliance
Executive Order 13834, Efficient Federal Operations	Completion of EA will document compliance

5.2 Irreversible or Irretrievable Commitments of Resources

Resources that are irreversibly or irretrievably committed to a project are those that are used on a long-term or permanent basis. This includes the use of non-renewable resources such as metal and fuel, and natural or cultural resources. These resources are irretrievable in that they would be used for this project when they could have been used for other purposes. Human labor is also considered an irretrievable resource. Another impact that falls under this category is the unavoidable destruction of natural resources that could limit the range of potential uses of that particular environment.

Implementation of the Proposed Action would involve human labor; the consumption of fuel, oil, and lubricants for construction vehicles; and loss of natural resources (vegetation at proposed Satellite

Station Site). Implementing the Proposed Action would not result in significant irreversible or irretrievable commitment of resources.

5.3 Unavoidable Adverse Impacts

This EA has determined that the alternatives considered would not result in any significant impacts. Implementing the alternatives would result in the following unavoidable environmental impacts:

- Loss of vegetation at the proposed Satellite Station.

5.4 Relationship between 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 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 site reduces future flexibility in pursuing other options, or that using a parcel of land or other resources often eliminates the possibility of other uses at that site.

In the short-term, effects to the human environment with implementation of the Proposed Action would primarily relate to the construction activity itself. Air quality and noise would be impacted in the short-term. There are no anticipated long-term impacts. The construction of the facility and operation would not significantly impact the long-term natural resource productivity of the area. The Proposed Action would not result in any impacts that would significantly reduce environmental productivity or permanently narrow the range of beneficial uses of the environment.

6 References

American National Standards Institute. (1988). American National Standard Quantities and Procedures for Description and Measurement of Environmental Sound, ANSI S12-9-1988. New York: Acoustical Society of America.

Brook, David. 1998. June 10. Letter from Deputy State Historic Preservation Officer, North Carolina Department of Cultural Resources to Charles W. Walker, PE, Head, Environmental Planning Branch, Department of the Navy, Naval Facilities Engineering Command.

Clement, Christopher O., Bryan C. Harrell. 2013. Archaeological Disturbance Assessment at Marine Corps Air Station (MCAS) Cherry Point, Craven County, North Carolina. April.

Council on Environmental Quality. (1997). Considering Cumulative Effects Under the National Environmental Policy Act. Washington, DC.

Cowan, J. P. (1994). Handbook of Environmental Acoustics. New York: John Wiley & Sons.

Davis, Thomas W., Kathleen M. Child, W. Patrick Giglio, Martha Williams, J. Michael West, Meril Dunn. 1997. Phase I Archaeological Investigations at Marine Corps Air Station Cherry Point, North Carolina, ER 97-7897. December.

Department of Defense. (2009, June 16). Memorandum from the Under Secretary of Defense. Methodology for Assessing Hearing Loss Risk and Impacts in DoD Environmental Impact Analysis. Washington, DC.

Department of the Navy. (2017). Final Environmental Assessment for Roadway Improvements in Support of Flightline Utilities Modernization at Marine Corps Air Station Cherry Point, North Carolina. May.

DoD Noise Working Group. (2009). Improving Aviation Noise Planning, Analysis and Public Communication with Supplemental Metrics - Guide to Using Supplemental Metrics.

Federal Highway Administration. (2016). Record of Decision US 70 Havelock Bypass. Federal Aid Project No. NHF-70 (49). December.

Fedeal Highway Administration. (2015). Administrative Action Final Environmental Impact Statement, Volume I of II, US 70 Havelock Bypass, Craven County, NC. October.

Federal Interagency Committee on Aviation Noise. (1997). Effects of Aviation Noise on Awakenings from Sleep.

Federal Interagency Committee on Noise. (1992). Federal Review of Selected Airport Noise Analysis Issues.

Federal Interagency Committee on Urban Noise. (1980). Guidelines for Considering Noise in Land Use Planning and Control. Washington, DC.

Harris, C. (1979). Handbook of Noise Control. New York: McGraw-Hill.

Levy, J. I. (2013). Residential Exposure to Aircraft Noise and Hospital Admissions for Cardiovascular Diseases; Multi-Airport Retrospective Study. BMJ, 347:f5561.

Ludlow, B., & Sixsmith, K. (1999). Long-term Effects of Military Jet Aircraft Noise Exposure during Childhood on Hearing Threshold Levels. Noise and Health, 33-39.

MCAS Cherry Point. 2012. Integrated Natural Resource Management Plan 2012-2022. May.

MCAS Cherry Point. 2014. Master Plan.

MCAS Cherry Point. 2013. Transportation Component Report for the Master Plan. December.

MCAS Cherry Point. 2018. Integrated Cultural Resources Management Plan.

MCAS Cherry Point. 2019. Marine Corps Community Services Recreation and Entertainment. Accessed at https://mccscherrypoint.com/recreation-entertainment/ on 19 November.

National Institute for Occupational Health and Safety. (1998). Criteria for a Recommended Standart Occupational Noise Exposure, Revised Criteria. Cincinnati: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention.

SEARCH Inc. 2019. October. Revised Draft Report. *Architectural Survey Update, Marine Corps Air Station Cherry Point.*

United States Environmental Protection Agency. (1974). Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with and Adequate Margin of Safety. EPA 550/9-74-004. Washington, DC: Office of Noise Abatement and Control.

United States Environmental Protection Agency. (1982). Guidelines for Noise Impact Analysis. EPA 550/9-82-105. Washington, DC: Office of Noise Abatement and Control.

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Appendix A
Air Quality Calculations

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Clearing 2 Acres

Off-road Equipment	Hours of Operation	Engine HP	Load Factor	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO_2 g/hp-hr	PM10 g/hp-hr	PM2.5 g/hp-hr	CO_2 g/hp-hr
Dozer	23	145	0.58	0.38	1.41	4.17	0.12	0.30	0.29	536
Loader/Backhoe	23	87	0.21	1.43	7.35	6.35	0.15	1.06	1.03	692
Small Backhoe	23	55	0.21	1.43	7.35	6.35	0.15	1.06	1.03	692

	VOC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	CO_2 lb
Dozer	1.61	6.03	17.80	0.49	1.26	1.22	2,284.41
Loader w/ integral Backhoe	1.33	6.81	5.88	0.14	0.98	0.96	640.76
Small backhoe	0.84	4.30	3.72	0.09	0.62	0.60	405.08

On-road Equipment	Hours of Operation	Engine HP	Speed (mph)	VOC lb/mile	CO lb/mile	NOx lb/mile	SO_2 lb/mile	PM10 lb/mile	PM2.5 lb/mile	CO_2 lb/mile
Dump Truck	11	230	45	0.0015	0.0080	0.0361	0.0000	0.0015	0.0015	3.4385

	VOC lb	CO lb	NOx lb	SO2 lb	PM lb	PM2.5 lb	CO_2 lb
Dump Truck	0.75	3.98	17.85	0.01	0.74	0.72	1,702
Subtotal in lbs	5	21	45	1	4	4	5032
Clearing Grand Total in Tons	**0.00**	**0.01**	**0.02**	**0.00**	**0.00**	**0.00**	**2.5**
Clearing Grand Total in Metric Tons							**2.3**

Site Prep - Excavate/Fill - Trenching - Grading

Site Prep - Excavate/Fill

(CY) 8,148 CY

Trenching (LF) 700 LF 78 CY

Grading (SY) 10,222 SY Assume compact 0.5 feet (0.166 yards) 1,697 CY compacted

Off-road Equipment	Hours	Engine HP	Load Factor	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO_2 g/hp-hr	PM10 g/hp-hr	PM2.5 g/hp-hr	CO_2 g/hp-hr
Excavator	27	243	0.59	0.34	1.21	4.03	0.12	0.22	0.22	536
Skid Steer Loader	33	160	0.23	0.38	1.47	4.34	0.12	0.31	0.30	536
Dozer (Rubber Tired)	30	145	0.59	0.38	1.41	4.17	0.12	0.30	0.29	536
Compactor	8	103	0.58	0.40	1.57	4.57	0.12	0.32	0.31	536
Grader	14	285	0.58	0.34	1.21	4.07	0.12	0.23	0.22	536
Backhoe/Loader	1	87	0.59	0.35	1.25	4.23	0.12	0.24	0.23	536

	VOC lb	CO lb	NOx lb	SO2 lb	PM lb	PM2.5 lb	CO_2 lb
Excavator	2.94	10.32	34.39	0.98	1.90	1.84	4,572.49
Skid Steer Loader	1.03	3.94	11.62	0.31	0.82	0.79	1,434.15
Dozer (Rubber Tired)	2.13	8.00	23.61	0.65	1.67	1.62	3,031.04
Compactor	0.42	1.65	4.81	0.12	0.34	0.33	564.36
Grader	1.74	6.10	20.56	0.58	1.14	1.11	2,706.74
Backhoe/loader	0.04	0.14	0.48	0.01	0.03	0.03	60.63

On-road Equipment	# trips	Engine HP	ave RT distance (mi)	VOC lb/mile	CO lb/mile	NOx lb/mile	SO2 lb/mile	PM lb/mile	PM2.5 lb/mile	CO_2 lb/mile
Dump Truck	679	265	30	0.0015	0.0080	0.0361	0.0000	0.0015	0.0015	3.4385

	VOC lb	CO lb	NOx lb	SO2 lb	PM lb	PM2.5 lb	CO_2 lb
Delivery Truck	30.99	163.82	734.76	0.37	30.65	29.70	70044.35
Subtotal (lbs):	**33**	**39**	**194**	**830**	**3**	**37**	**35**
Site Prep Work Grand Total in Tons	**0.02**	**0.02**	**0.10**	**0.42**	**0.00**	**0.02**	
Site Prep Work Grand Total in Metric Tons							**0.02**

Gravel Work 2,716 CY

Off-road Equipment	Hours	Engine HP	Load Factor	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO_2 g/hp-hr	PM_{10} g/hp-hr	$PM_{2.5}$ g/hp-hr	CO_2 g/hp-hr
Dozer	27	185	0.59	0.34	1.21	4.08	0.12	0.23	0.22	536
Wheel Loader for Spread	34	87	0.59	0.35	1.25	4.23	0.12	0.24	0.23	536
Compactor	75	103	0.43	0.36	1.34	4.45	0.12	0.26	0.25	536

	VOC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	CO_2 lb
Dozer	2.23	7.84	26.51	0.75	1.47	1.42	3,481
Wheel Loader for Spreading	1.34	4.80	16.29	0.44	0.92	0.89	2,061
Compactor	2.63	9.80	32.60	0.84	1.88	1.83	3,923

On-road Equipment	# trips	Engine HP	ave RT distance (mi)	VOC lb/mile	CO lb/mile	NOx lb/mile	SO2 lb/mile	PM lb/mile	PM2.5 lb/mile	CO_2 lb/mile
Dump Truck	226	265	30	0.0015	0.0080	0.0361	0.0000	0.0015	0.0015	3.4385

	VOC lb	CO lb	NOx lb	SO2 lb	PM lb	PM2.5 lb	CO_2 lb
Delivery Truck	10.33	54.61	244.92	0.12	10.22	9.90	23348.12
Subtotal (lbs):	**17**	**17**	**80**	**329**	**2**	**15**	**15**
Gravel Work Grand Total in Tons	**0.01**	**0.01**	**0.04**	**0.16**	**0.00**	**0.01**	
Gravel Work Grand Total in Metric Tons							**0.01**

Concrete Work - Foundation and Sidewalks

Total 4,664 CY Note: Assume all excavated soil is accounted for in Excavate/Fill and Trenching

				Emission Factors						
Off-road Equipment	Hours of Operation	Engine HP	Load Factor	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO_2 g/hp-hr	PM10 g/hp-hr	PM2.5 g/hp-hr	CO_2 g/hp-hr
Concrete Mixer	246	3.5	0.43	0.69	3.04	6.17	0.13	0.54	0.52	588
Concrete Truck	222	300	0.43	0.38	1.75	6.18	0.11	0.27	0.26	530

	Annual Emissions						
	VOC lb	CO lb	NOx lb	SO2 lb	PM lb	PM2.5 lb	CO_2 lb
Concrete Mixer	0.56	2.48	5.04	0.10	0.44	0.43	480.17
Concrete Truck	23.96	110.22	390.34	7.20	16.96	16.46	33,455.50
Subtotal (lbs):	**25**	**113**	**395**	**7**	**17**	**17**	**33,936**
Concrete Work Grand Total in Tons	**0.01**	**0.06**	**0.20**	**0.00**	**0.01**	**0.01**	17
Concrete Work Grand Total in Metric Tons							**15**

Material Deliveries

On-road Equipment	# trips	Engine HP	ave RT distance (mi)	VOC lb/mile	CO lb/mile	NOx lb/mile	SO2 lb/mile	PM lb/mile	PM2.5 lb/mile	CO_2 lb/mile
Delivery Truck	420	265	30	0.0015	0.0080	0.0361	0.0000	0.0015	0.0015	3.4385

	VOC lb	CO lb	NOx lb	SO2 lb	PM lb	PM2.5 lb	CO_2 lb
Delivery Truck	19.17	101.33	454.48	0.23	18.96	18.37	43,326
Building Construction Grand Total in Tons	**0.01**	**0.05**	**0.23**	**0.00**	**0.01**	**0.01**	
Building Construction Grand Total in Metric Tons							**20**

Building Demolition

12,712 SF 636 Estimated CY of debris based on 20 SF/CY

				Emission Factors						
Off-road Equipment	Hours of Operation	Engine HP	Load Factor	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO_2 g/hp-hr	PM_{10} g/hp-hr	$PM_{2.5}$ g/hp-hr	CO_2 g/hp-hr
Hydraulic excavator	106	86	0.59	0.23	2.57	2.68	0.11	0.40	0.39	595.46
Loader /Backhoe	106	87	0.23	1.07	6.13	5.02	0.14	0.95	0.92	692.77
air compressor	106	49	0.59	0.26	1.41	3.51	0.11	0.23	0.22	536.20

	Annual Emissions						
	VOC lb	CO lb	NOx lb	SO_2 lb	PM_{10} lb	$PM_{2.5}$ lb	CO_2 lb
Hydraulic excavator	2.72	30.48	31.78	1.35	4.78	4.63	7,060.71
Loader /Backhoe	4.99	28.65	23.48	0.66	4.44	4.30	3,239.49
air compressor	1.77	9.52	23.70	0.73	1.57	1.52	3,622.55
Subtotal (lbs):	9.48	68.65	78.97	2.74	10.78	10.46	13922.74

On-road Equipment	# trips	Engine HP	ave RT distance (mi)	VOC lb/mile	CO lb/mile	NOx lb/mile	SO2 lb/mile	PM lb/mile	PM2.5 lb/mile	CO_2 lb/mile
Dump Truck	53	265	30	0.0015	0.0080	0.0361	0.0000	0.0015	0.0015	3.4385

	VOC lb	CO lb	NOx lb	SO2 lb	PM lb	PM2.5 lb	CO_2 lb
Delivery Truck	2.42	12.78	57.32	0.03	2.39	2.32	5463.84
Subtotal (lbs):	11.89	81.43	136.28	2.77	13.17	12.77	19,386.58
Building Demo Grand Total in Tons	**0.006**	**0.041**	**0.068**	**0.001**	**0.007**	**0.006**	
Building Demo Grand Total in Metric Tons							**8.79**

Paving Surface and Paving HMA

Pavement - Surface Area 48,000 SF 1,185 CY

Paving - HMA 790 CF

Off-road Equipment	Hours of Operation	Engine HP	Load Factor	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO2 g/hp-hr	PM g/hp-hr	PM2.5 g/hp-hr	CO_2 g/hp-hr
Grader	147	145	0.59	0.38	1.41	4.16	0.12	0.30	0.29	536
Roller	221	401	0.59	0.34	2.46	5.53	0.12	0.34	0.33	536
Paving Machine	294	164	0.59	0.38	1.44	4.25	0.12	0.30	0.29	536
Asphalt Curbing Machine	37	130	0.59	0.40	1.57	4.57	0.12	0.32	0.31	536

	VOC lb	CO lb	NOx lb	SO2 lb	PM lb	PM2.5 lb	CO_2 lb
Grader	10.44	39.15	115.37	3.19	8.20	7.95	14,852
Roller	39.35	283.89	638.02	13.29	39.04	37.87	61,763
Paving Machine	23.83	90.47	266.68	7.23	18.82	18.25	33,596
Asphalt Curbing Machine	2.44	9.71	28.22	0.71	1.97	1.91	3,311

On-road Equipment	# trips	Engine HP	ave RT distance (mi)	VOC lb/mile	CO lb/mile	NOx lb/mile	SO2 lb/mile	PM lb/mile	PM2.5 lb/mile	CO_2 lb/mile
Dump Truck	296	230	30	0.001521	0.008042	0.036070	1.80E-05	0.001504	0.001458	3.438541

	VOC lb	CO lb	NOx lb	SO2 lb	PM lb	PM2.5 lb	CO_2 lb
Dump Truck	13.52	71.48	320.62	0.16	13.37	12.96	30,565

Hot Mix Asphalt (HMA	Volume of HMA (ft^3)	Weight of HMA (tons)	VOC lb/ton	VOC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	CO_2 lb
Standard Hot Mix Asphalt	790	4,899	0.04	195.96	-	-	-	-	-	-
			Subtotal (lbs):	**286**	**495**	**1,369**	**25**	**81**	**79**	**144,086**
			Paving Grand Total in Tons	**0.14**	**0.25**	**0.68**	**0.01**	**0.04**	**0.04**	
			Paving Grand Total in Metric Tons							**65**

Fugitive Dust Emissions:

PM_{10} tons/acre/mo	acres	days of disturbance	PM_{10} Total	$PM_{2.5}/PM_{10}$ Ratio	$PM_{2.5}$ Total
0.42	1	180	3	0.1	0.3

Construction Worker POV emissions

	# vehicles	# days	mi/day	VOC lb/mi	CO lb/mi	NOx lb/mi	SO2 lb/mi	PM10 lb/mi	PM2.5 lb/mi	CO_2 lb/mi
annually	30	260	30	0.000547	0.004718	0.000437	1.07216E-05	0.000095	6.25868E-05	1.10
				VOC lb	**CO** lb	**NOx** lb	**SO2** lb	**PM10** lb	**PM2.5** lb	**CO_2** lb
				128	1104	102	3	22	15	258,561
POV Grand Total in Tons				**0.06**	**0.55**	**0.05**	**0.00**	**0.01**	**0.01**	
POV Total in Metric Tons										**117**

Annual Emission Totals:

VOC T/yr	CO T/yr	NOx T/yr	SO2 T/yr	PM_{10} T/yr	$PM_{2.5}$ T/yr	CO_2 MT/yr
0.3	1.0	1.4	0.6	2.6	0.4	228.8