Directed Energy Systems Integration Laboratory (DESIL) Land-Based Laser Target Sites at Naval Base Ventura County Point Mugu, CA

Final Environmental Assessment

June 2021

Prepared for:
United States Department of the Navy

NAVSEA
WARFARE CENTERS
Port Hueneme

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DEPARTMENT OF DEFENSE
DEPARTMENT OF THE NAVY

FINDING OF NO SIGNIFICANT IMPACT FOR THE DIRECTED ENERGY SYSTEMS INTEGRATION LABORATORY (DESIL) LAND-BASED LASER TARGET SITES AT NAVAL BASE VENTURA COUNTY, POINT MUGU, CALIFORNIA

Pursuant to the Council on Environmental Quality regulations (40 Code of Federal Regulations Parts 1500-1508) implementing the National Environmental Policy Act, Department of the Navy (Navy) Regulations (32 Code of Federal Regulations Part 775), and the Office of the Chief of Naval Operations Instruction 5090.1E, the Navy gives notice that an Environmental Assessment (EA) has been prepared and an Environmental Impact Statement is not required to implement the construction and operation of land-based laser target sites at Naval Base Ventura County (NBVC), Point Mugu, California.

Proposed Action: The Navy proposes to construct a land-based laser target site (LATS) building at NBVC Point Mugu, and to conduct laser testing operations from the DESIL to the newly constructed LATS building and mobile target sites at the existing Nike Zeus and Alpha Pads.

Purpose and Need: The purpose of the Proposed Action is to support current and future Directed Energy (DE) weapon testing programs at DESIL in order to accelerate the Navy's efforts to deliver laser systems to warfighters. The Proposed Action is needed to further the Navy's DE Test Program with land-based laser target sites in an operationally relevant maritime environment.

Public Participation: The Navy published a Notice of Availability of the Draft EA in the Ventura County Star Newspaper on Thursday, 8 October 2020 and Saturday, 10 October 2020 and in La Vida Newspaper on Thursday, 8 October 2020. The Navy also made the Draft EA available for public review on the Navy Region Southwest public website. Due to COVID-19 conditions, a hard copy was not submitted to the Ray D. Prueter Public Library; however, hard copies were available upon request. No requests for hard copies were received. The public comment period was from 9 October to 23 October 2020. No comments were received.

Alternatives Analyzed: The Navy analyzed the No Action Alternative and two action alternatives in the EA.

No Action Alternative: The No Action Alternative represents the status quo in which, the Navy would not construct land-based target sites or conduct land-to-land laser operations at NBVC Point Mugu, CA.

Alternative 1: Alternative 1 would result in the new construction of a fully instrumented LATS at L Avenue on NBVC Point Mugu and would also include operation of land-to-land DE operations from the DESIL to the new LATS and two land-based mobile target sites located at the existing Nike Zeus and Alpha Pads. The Navy would construct a new LATS building consisting of a 400- to 500-square-foot, one-story, 15- to 18-foot high structure that would house electro-optical instrumentation for the characterization of laser beams, to perform studies, and to verify laser system operations prior to live test and evaluation events on the Point Mugu Sea Range. Backstops would also be used to contain laser energy, preventing lasers from shooting through or past a mobile target site. The Navy would also install up to five new manually operated drop arms across the following roads to temporarily limit access to the area between the DESIL and the target sites during laser operations: South L Avenue at the 18th Street intersection, Beach Road at South M Avenue, Beach Road on the western side of G Avenue intersection, 20th Street west of G Avenue, and the entrance to Surfer Beach.

The Navy proposes testing two general types of laser systems at DESIL: High Energy Lasers (HELs) (up to 1 megawatt average) and Lower Power Lasers (up to 1 kilowatt average). Typically, Lower Powers Lasers (e.g., Dazzlers or target illumination lasers) use a beam width up to two meters, whereas an HEL employs a more focused beam with a typical width of 10 to 50 centimeters. For the purposes of this analysis, the Navy assumed a beam width of 20 centimeters for HEL. Laser operations would occur up to 116 days per year. Some of these operations may occur at night. Initial laser testing may occur a few times per year and may increase over time up to 116 days a year but may be lower depending on operational requirements, test objectives, and scheduling availability. The cumulative operating time of HEL and Lower Power Laser use is not anticipated to exceed 34 hours per year.

As part of Alternative 1, the Navy would implement conservation measures to further avoid or minimize potential impacts to resources.

Alternative 2: Alternative 2 would be the same as Alternative 1, except no construction of the LATS building would occur at L Avenue. The Navy would instead construct a concrete pad and install electrical power and communications circuits at the northeastern corner at the intersection of L Avenue and Beach Road for use as a new land-based mobile target site. Backstops would also be used to contain laser energy. Under Alternative 2, proposed testing operations would be the same as those described for Alternative 1.

The Navy considered but did not carry forward several alternatives. As summarized in the following sections, the Navy eliminated these alternatives because they did not meet the purpose and need for the project and/or satisfy the Navy's screening factors (i.e., located at or near shore; clear line of sight; adequate size; compatibility with land uses and existing operations; and controlled access).

> The Building 57-A target site is located approximately 4,680 linear feet from the point of origin. This potential target site presented several immovable obstructions from both points of origin.
>
> The Building 57-B target site is located approximately 4,485 linear feet from the point of origin. This potential target would present immovable obstructions from both points of origin.
>
> The Building 57-C target site is located approximately 4,270 linear feet from the point of origin. Building 735 is within the line of sight and presents an immovable obstruction. The site would also be in direct conflict with the laser beam from both points of origin.
>
> Locations other than NBVC Point Mugu were considered thoroughly in an EA the Navy prepared in 2019. As presented in the 2019 EA, the Navy identified and considered NBVC Point Mugu and other potential DoD locations and Federal properties as alternative locations for conducting the proposed action. Sites that were not at or near the shoreline and did not have direct access and clear line of sight to a Navy/DoD sea range were eliminated, leaving four potential locations: NBVC Point Mugu, Eglin Air Force Base, National Aeronautics and Space Administration Wallops Island, and NBVC San Nicolas Island. Of the four locations, NBVC Point Mugu was the only location that met the purpose and need of the proposed action and all screening factors. None of the other potential locations met all screening factors.

Alternative to Be Implemented: The Navy has selected Alternative 1 for implementation because it best meets the purpose and need of the project and Alternative 1 would have no significant impacts.

Environmental Effects: The EA addressed the following resource areas in detail: air quality, biological resources, coastal resources, and water resources. As summarized below, potential impacts were determined to be negligible or nonexistent, therefore, the EA did not evaluate the following resources in detail: geological resources; marine biological resources; cultural resources; visual resources; noise; infrastructure; transportation; socioeconomics/environmental justice; hazardous materials and hazardous wastes; airspace/airfield operations; land use; and public health and safety.

Air Quality: Construction and operational emissions associated with Alternative 1 would be well below the General Conformity *de minimis* thresholds. Construction and operations would comply with applicable Ventura County Air Pollution Control District permitting and California Air Resources Board Portable Equipment Registration Program compliance requirements, as necessary for mobile generators used for operations. Accordingly, the Navy prepared a Record of Non-Applicability. Therefore, Alternative 1 would not have significant impacts to air quality.

Biological Resources:

Construction

Proposed construction of the L Avenue land-based target site would result in the permanent removal of 0.11 acre (0.05 hectare [ha]) of Vancouverian Coastal Dune and Bluff habitat. Another 0.60 acre (0.02 ha) would be temporarily impacted from vehicles, laydown, and other construction related activities. The L Avenue site is located across the street from sandy dune habitat regularly used by the federally threatened Western snowy plover (*Charadrius nivosus nivosus*) and the federally endangered California least tern (*Sterna antillarum* ssp. *browni*). The L Avenue site is also located adjacent to saltmarsh habitat for the federally endangered light-footed Ridgway's rail (*Rallus obsoletus levipes*).

Construction of the L Avenue LATS would be scheduled to avoid the light-footed Ridgway's rail breeding season, which is 1 March to 1 September. Prior to construction of the L Avenue LATS, adjacent wetlands would be flagged for avoidance. With implementation of the conservation measures, construction of the L Avenue LATS would not result in a significant impact on light-footed Ridgway's rail. Furthermore, with implementation of the conservation measures, construction of the L Avenue LATS may affect but is not likely to adversely affect the light-footed Ridgway's rail.

Construction of the proposed L Avenue LATS would occur outside of the Western snowy plover nesting season. Thus, there would be no impacts to nesting Western snowy plover. Non-breeding Western snowy plover are not found in close enough proximity to the project site (no closer than 400 feet to the nearest plover foraging habitat) to be potentially impacted by construction related activities. The slope of the beach along the wrack line where Western snowy plover forage is lower in elevation than the L Avenue site. The presence of large dunes south of Beach Road would further help to attenuate construction noise. Ambient noise from the surf and aircraft (ranging from 75 to 80 decibels) would further mask construction noise. Western snowy plover tolerance and adaptability (especially during non-nesting season) to human activities would remove any potential disturbance from project construction. With implementation of the conservation measures, construction of the L Avenue LATS would have no impact on the Western snowy plover.

Because construction would occur outside of the California least tern nesting season, there would be no impacts from construction related activities, as California least tern are not present at NBVC Point Mugu

outside of the nesting season. With implementation of the conservation measures, construction of the L Avenue LATS would have no impact on the California least tern.

Operations

Due to the very low abundance of light-footed Ridgway's rail within the action area, their ground-dwelling behavior combined with the low tempo of laser operations (i.e., less than 34 cumulative hours of HEL and Lower Power Laser use within a year) and relatively small hazard area, the likelihood of a light-footed Ridgway's rail being directly impacted by laser operations is so low as to be discountable. As light-footed Ridgway's rail regularly remain under cover and do not flush readily from nests, disturbance from visible lasers overhead or nearby is also unlikely. With implementation of conservation measures, the proposed laser operations would not result in significant impacts to light-footed Ridgway's rail. Furthermore, with implementation of the conservation measures, laser operations may affect but are not likely to adversely affect light-footed Ridgway's rail.

Due to the behavior of Western snowy plover at NBVC Point Mugu to habituate well to nearby activities, the limited nests in the action area, the low flight height of the Western snowy plover, the low tempo of laser operations (i.e., less than 34 cumulative hours of HEL and Lower Power Laser use per year), and relatively small hazard area, the potential for adverse impacts to Western snowy plover are very low. With implementation of the conservation measures, the proposed laser operations would not result in significant impacts to Western snowy plover. Furthermore, with implementation of the conservation measures, laser operations may affect but are not likely to adversely affect Western snowy plover.

Due to the limited (seasonal) presence of California least tern at NBVC Point Mugu, the average distance of nests from the laser pathway (approximately 250 feet), combined with the low tempo of laser operations, and relatively small hazard area, the likelihood of a California least tern being affected by laser operations is low but is still not discountable. The Navy has therefore determined that laser testing activities may affect and are likely to adversely affect California least terns. However, with implementation of conservation measures, the proposed laser operations would not result in significant impacts to California least tern.

On 8 October 2020, the Navy initiated formal consultation per Section 7 of the Endangered Species Act with the United States Fish and Wildlife Service (USFWS) by submitting a Biological Assessment to the USFWS. In the Biological Assessment, the Navy determined that the proposed action falls under a "may affect and is likely to adversely affect" determination for California least tern, and a "may affect but not likely to adversely affect" determination for Western snowy plover and light-footed Ridgway's rail.

On 16 April 2021, in their Biological Opinion, the USFWS concurred with the Navy's determination that construction and testing activities may affect but are not likely to adversely affect the Western snowy plover and light-footed Ridgway's rail. In addition, the USFWS concluded in their Biological Opinion that Alternative 1 would not jeopardize the continued existence or recovery of California least tern.

The USFWS issued an Incidental Take Statement which allows for the following:

> "… during any 2-year period if, as a result of project activities, three (3) breeding adult California least terns are injured or killed, four (4) eggs are damaged or abandoned (from one or more nests), or four (4) chicks are abandoned, killed, or injured (from one or more nests), the Navy must contact our office immediately to reinitiate formal consultation. Project activities that are

> likely to cause additional take should cease as the exemption provided pursuant to section7(o)(2) may lapse and any further take could be a violation of section 4(d) or 9."

Terms and Conditions outlined by the USFWS are as follows:

> "The Navy must request our approval of any biologist that they or their contractors employ to conduct project activities associated with the California least tern pursuant to this biological opinion. Such requests must be in writing and be received by the Ventura Fish and Wildlife Office at least 30 days prior to any such activities being conducted. Please be advised that possession of a 10(a)(1)(A) permit for the California least tern does not substitute for the implementation of this measure. Authorization of Service-approved biologists is valid for this project only."

With the continuation of the Navy's overall stewardship and conservation program for the light-footed Ridgway's rail, Western snowy plover, and California least tern, and implementation of the identified conservation measures, implementation of Alternative 1 would not result in an appreciable reduction in the numbers, reproduction or distribution of the light-footed Ridgway's rail, Western snowy plover, or California least tern. Therefore, Alternative 1 would not have significant impacts to biological resources.

Coastal Resources:

Coastal Zone Management

Alternative 1 would occur within the boundaries of NBVC Point Mugu where access is controlled and restricted to authorized personnel. There is no public access to the project area and no public recreation opportunities are located within the project area.

Although the project area is adjacent to the shoreline, all construction activities would occur inland and away from the shoreline. Direct impacts associated with construction at L Avenue would not disturb the shoreline.

Sea Level Rise and Climate Change

The L Avenue site is protected by a broader beach and more stable dunes. The proposed L Avenue LATS site has no history of flooding. Furthermore, to minimize risk from potential future sea level rise, the proposed L Avenue site may be elevated one to three feet depending on an engineering analysis in order to provide additional protection. Therefore, Alternative 1 would not have significant impacts to coastal resources or uses.

The Navy prepared a Coastal Consistency Negative Determination and submitted it to the California Coastal Commission. In a letter to the Navy dated 3 February 2021, the California Coastal Commission concurred with the Navy's determination that Alternative 1 would not adversely affect coastal zone resources.

Water Resources: Alternative 1 would not impact groundwater or floodplains, would include stormwater management controls, and would result in a negligible increase in impervious surface area. Alternative 1 would not impact wetlands and adjacent wetlands and jurisdictional waters would be flagged prior to construction for avoidance. Furthermore, the Navy has prepared and is implementing an erosion control plan to assess and reduce soil erosion on NBVC Point Mugu. Best Management Practices would be implemented to prevent inadvertent runoff of potential contaminants, such as construction debris, and petroleum products. Implementation of best management practices for erosion and stormwater control

would reduce the potential for discharge into the Pacific Ocean or Mugu Lagoon. Similarly, the L Avenue LATS would incorporate stormwater design requirements specified in Section 438 of the Energy Independence Security Act to manage stormwater and avoid water quality impacts to the Pacific Ocean or Mugu Lagoon. Therefore, Alternative 1 would not have significant impacts to water resources.

Finding: Based on the analysis presented in the EA, which has been prepared in accordance with the requirements of NEPA and Navy policies and procedures (32 Code of Federal Regulations Part 775, as amended), the Navy finds that implementation of Alternative 1 will not significantly affect the quality of the human environment. Therefore, preparation of an Environmental Impact Statement is not necessary.

The Final EA and Finding of No Significant Impact is on file and interested parties may obtain a copy by contacting Naval Surface Warfare Center Port Hueneme Division, Attn: Chad Lousen, 4363 Missile Way, Port Hueneme, CA, 93042, or via email to chad.lousen@navy.mil.

August 7, 2021

Date

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Ms. Stephanie Douglas
Executive Director, Industrial Operations
Naval Sea Systems Command (SEA 04)

Abstract

Designation:	Environmental Assessment
Title of Proposed Action:	Directed Energy Systems Integration Laboratory Land-Based Laser Target Sites
Project Location:	Naval Base Ventura County, Point Mugu, California
Lead Agency:	Department of the Navy
Affected Region:	Ventura County, California
Action Proponent:	Naval Sea Systems Command, Naval Surface Warfare Center Port Hueneme Division
Point of Contact:	Naval Facilities Engineering Command Southwest Environmental Core Team, Code EV24.BL 750 Pacific Highway (12th Floor) San Diego, CA 92132
Date:	June 2021

The United States Department of the Navy has prepared this Environmental Assessment in accordance with the National Environmental Policy Act, as implemented by Council on Environmental Quality regulations and Navy regulations for implementing the National Environmental Policy Act. The Proposed Action would involve the construction and operation of land-based laser target sites at Naval Base Ventura County, Point Mugu, California. The land-based targets would be engaged from directed energy laser systems at Directed Energy Systems Integration Laboratory for the purposes of alignment, calibration, and testing of the lasers. This Environmental Assessment evaluates the potential environmental impacts associated with the Proposed Action Alternatives and the No Action Alternative to the following resource areas: air quality, biological resources, coastal resources, and water resources.

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Executive Summary

ES.1 Proposed Action

The United States Department of the Navy (Navy) proposes to conduct land-to-land laser operations from the Directed Energy Systems Integration Laboratory (DESIL) to land-based laser target sites at Naval Base Ventura County (NBVC) Point Mugu. The Proposed Action would include construction of a permanent land-based laser target site (LATS) located on the northeastern corner at the intersection of L Avenue and Beach Road. The Proposed Action would also involve the use of the existing Nike Zeus and Alpha Pads as land-based mobile target sites. The Navy would conduct testing operations from the DESIL to the land-based laser target sites.

ES.2 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to support current and future Directed Energy (DE) weapon testing programs at DESIL in order to accelerate the Navy's efforts to deliver laser systems to warfighters. The Proposed Action is needed to further the Navy's DE Test Program with land-based laser target sites in an operationally relevant maritime environment.

ES.3 Alternatives Considered

This Environmental Assessment (EA) carries forward for detailed analysis two action alternatives that meet the purpose and need for the Proposed Action and the alternative screening criteria. This EA also carries forward the No Action Alternative for detailed analysis. The No Action Alternative represents the status quo in which the Navy would not implement the Proposed Action at NBVC Point Mugu.

Alternative 1 would result in the new construction of a fully instrumented LATS building at L Avenue and would also include operation of land-to-land DE operations from the DESIL to the new LATS building and two land-based mobile target sites located at the existing Nike Zeus and Alpha Pads. The LATS building at L Avenue would include a new 400- to 500-square-foot permanent one-story (approximately 15 to 18 feet high) building to house electro-optical instrumentation for the characterization of laser beams, to perform studies and to verify laser system operation prior to live testing and evaluation. The building would also contain an Instrument Control Room protected from laser energy for operators who control/monitor equipment during lasing and accomplish data capture.

The Navy would conduct land-to-land DE systems testing operations from the DESIL to the proposed LATS building and two additional land-based mobile target sites located at the existing Nike Zeus Pad and Alpha Pad. The mobile target sites at the Nike Zeus Pad and Alpha Pad would consist of container express (CONEX) boxes (or similar), trailers, instrumentation equipment, target boards, and other temporary support equipment such as portable generators and/or chiller. The doors of the trailer or CONEX box would face the DESIL facility. When the DESIL is ready to engage that instrumentation or target, the doors of the trailer or CONEX box would be opened. A system at DESIL would engage the laser target through the open doorway of the trailer or CONEX box. Backstops would also be used to contain laser energy, preventing lasers from shooting through or past a mobile target site.

The Navy would also install up to five new manually operated drop arms across the following roads to limit access to the area between the DESIL and the target sites during laser operations: South L Avenue at the 18th Street intersection, Beach Road at South M Avenue, Beach Road on the western side of G Avenue intersection, 20th Street west of G Avenue, and the entrance to Surfer Beach.

Operation of the LATS building and mobile target sites would involve scheduled testing activities that direct laser energy at the three land-based targets from fixed laser sources located at DESIL. The Navy estimates conducting laser testing up to 116 days/year, including some events occurring during the nighttime. Initial laser testing may occur a few times per year and may increase over time but may be lower depending on operational requirements, test objectives, and scheduling availability. Typical test event duration would be several hours or more in a 24-hour period. Multiple lasers could be operated within an event. Typical event duration time would include the initial set-up, road closure, testing, an all-safe determination, then road opening.

The Navy previously analyzed the construction of the DESIL (Navy, 2019a) and the use of DE systems on the Point Mugu Sea Range (Navy, 2014); therefore, this EA does not analyze these activities.

Alternative 2 would be the same as Alternative 1 except no construction of the LATS building would occur at L Avenue. The Navy would instead construct a concrete pad and install electrical power and communications circuits at the northeastern corner at the intersection of L Avenue and Beach Road for use as a new land-based mobile target site. Backstops would also be used to contain laser energy, preventing lasers from shooting through or past a mobile target site. Under Alternative 2, proposed testing operations would be the same as those described for Alternative 1.

ES.4 Summary of Environmental Resources Evaluated in the Environmental Assessment

Council on Environmental Quality regulations, National Environmental Policy Act, and Navy instructions for implementing NEPA, specify that an EA should address those resource areas potentially subject to impacts. In addition, the level of analysis should be commensurate with the anticipated level of environmental impact.

The following resource areas have been addressed in this EA: air quality, biological resources, coastal resources, and water resources. Potential impacts on certain resources were determined to be negligible or nonexistent, therefore the EA did not evaluate the following resources in detail: geological resources; marine biological resources; cultural resources; visual resources; noise; infrastructure; transportation; socioeconomics/environmental justice; hazardous materials and hazardous wastes; airspace/airfield operations; land use; and public health and safety.

ES.5 Summary of Potential Environmental Consequences of the Action Alternatives

Table ES-1 summarizes potential impacts to resources associated with the alternatives analyzed.

Table ES-1 Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Alternative 1*	*Alternative 2*
Air Quality	No Impact. There would be no change to existing conditions; therefore, no impacts would occur.	No Significant Impact. • Temporary and negligible increase of emissions. • Construction and operational emissions would be well below the General Conformity *de minimis* thresholds.	No Significant Impact. • Under Alternative 2, impacts would be less than those under Alternative 1.
Biological Resources	No Impact. There would be no change to existing conditions; therefore, no impacts would occur.	No Significant Impact. • Permanent removal of up to 0.11 acre (0.05 hectare [ha]) of Vancouverian Coastal Dune and Bluff vegetation. • Temporary impacts to up to 0.60 acre (0.02 ha) of Vancouverian Coastal Dune and Bluff vegetation. • Wildlife could be temporarily displaced during construction activities. • Operational use of lasers may result in direct temporary and permanent impacts to birds including federally listed species.	No Significant Impact. • Impacts would be similar to Alternative 1.
Coastal Resources	No Impact. There would be no change to existing conditions; therefore, no impacts would occur.	No Significant Impact. • No effect to coastal resources or uses.	No Significant Impact. • Impacts would be similar to Alternative 1.
Water Resources	No Impact. There would be no change to existing conditions; therefore, no impacts would occur.	No Significant Impact. • Construction activities would result in a potential for temporary increases in stormwater runoff and erosion. • Post-construction increase in impervious surface by approximately 0.14 acre (0.06 ha).	No Significant Impact. • Impacts would be similar to Alternative 1.

Final Environmental Assessment
Directed Energy Systems Integration Laboratory (DESIL)
Land-Based Laser Target Sites
Naval Base Ventura County, Point Mugu, CA

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Abbreviations and Acronyms

Acronym	Definition
AICUZ	Air Installation Compatible Use Zone
APZ	accident potential zone
asl	above sea level
BMP	Best Management Practices
BSSP	Belding's Savannah Sparrow
CARB	California Air Resources Board
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CLTE	California least tern
CO	carbon monoxide
CONEX	container express
CWA	Clean Water Act
DE	Directed Energy
DESIL	Directed Energy Systems Integration Laboratory
DoD	Department of Defense
DOI	Department of Interior
EA	Environmental Assessment
EIS	Environmental Impact Statement
EISA	Energy Independence and Security Act
EO	Executive Order
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FONSI	Finding of No Significant Impact
GHGs	greenhouse gases
ha	hectare
HEL	High Energy Laser
HC	hydrocarbons
INRMP	Integrated Natural Resources Management Plan
IRP	Installation Restoration Program
JATO	Jet Assisted Take-Off
km	kilometer
LARWQCB	Los Angeles Regional Water Quality Control Board
LATS	Laser Target Site
LFRR	light-footed Ridgway's rail
MBTA	Migratory Bird Treaty Act
MMMR	Minimization, Mitigation, Monitoring and Reporting
MRP	Munitions Response Program
NAAQS	National Ambient Air Quality Standards
Navy	United States Department of the Navy
NAVFAC SW	Naval Facilities Engineering Command Southwest
NAVSEA	Naval Sea Systems Command
NBVC	Naval Base Ventura County
NEPA	National Environmental Policy Act
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NSWC	Naval Surface Warfare Center
NSWC PHD	Naval Surface Warfare Center Port Hueneme Division
OEIS	Overseas Environmental Impact Statement
OPNAVINST	Office of the Chief of Naval Operations
Pb	Lead
$PM_{2.5}$	fine particulate matter less than or equal to 2.5 microns in diameter
PM_{10}	suspended particulate matter less than or equal to 10 microns in diameter
PMSR	Point Mugu Sea Range
RDAT&E	Research, Development, Acquisition, Test and Evaluation
RONA	Record of Non-Applicability
SHPO	State Historic Preservation Office
SO_2	sulfur dioxide
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TIL	Target Illumination Laser
tpy	tons per year
U.S.	United States
U.S.C.	United States Code
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VOC	Volatile organic compounds
WSPL	Western snowy plover

1 Purpose of and Need for the Proposed Action

1.1 Introduction

The United States (U.S.) Department of the Navy (Navy) proposes the new construction of a land-based Laser Target Site (LATS) and conducting land-to-land directed energy (DE) systems testing operations at Naval Base Ventura County (NBVC) Point Mugu, California. The action proponent for this Environmental Assessment (EA) is Naval Sea Systems Command (NAVSEA) Naval Surface Warfare Center, Port Hueneme Division (NSWC PHD). The Navy has prepared this EA in accordance with the National Environmental Policy Act (NEPA), as implemented by Council on Environmental Quality (CEQ) regulations and Navy regulations for implementing NEPA.

1.2 Location

The Proposed Action would occur at NBVC Point Mugu, California (Figure 1-1). NBVC Point Mugu is a component of NBVC, which was formed in 2000 with the consolidation of naval installations at Point Mugu, Port Hueneme, and San Nicolas Island. NBVC Point Mugu is composed of 4,500 acres (1,800 hectares [ha]) of land, including support facilities and infrastructure and is situated along the coast of Ventura County, California, approximately 5 miles (8 kilometers [km]) south of Oxnard and 50 miles (80 km) west of Los Angeles, California. NSWC PHD is also located at NBVC in the coastal area of Southern California adjacent to the Point Mugu Sea Range (PMSR). Proximity to the PMSR represents a superior geographical location for DE testing of high energy lasers (HELs) in a maritime environment.

1.3 Background

The mission of NSWC PHD is to provide test and evaluation; systems engineering; integrated product support; in-service engineering; and integration of surface ship weapons, combat systems, and warfare systems. NSWC PHD objectives are to improve integrating naval combat systems readiness and advance the development and deployment of new capabilities to the Navy Fleet. NSWC PHD's mission is integrally aligned with the objectives of the DE Program to develop laser technologies for the Navy.

In July 2019, the Navy completed the Final EA for the Directed Energy Systems Integration Laboratory (DESIL) at NBVC, Point Mugu, California (Navy, 2019a) (hereinafter referred to as the 2019 DESIL EA). That EA analyzed impacts from construction of a laser laboratory near the shoreline. The operation of lasers from NBVC Point Mugu to the adjacent PMSR had previously been evaluated in the 2014 Point Mugu Sea Range Countermeasures Testing EA (Navy, 2014) and is not part of the Proposed Action analyzed in this EA.

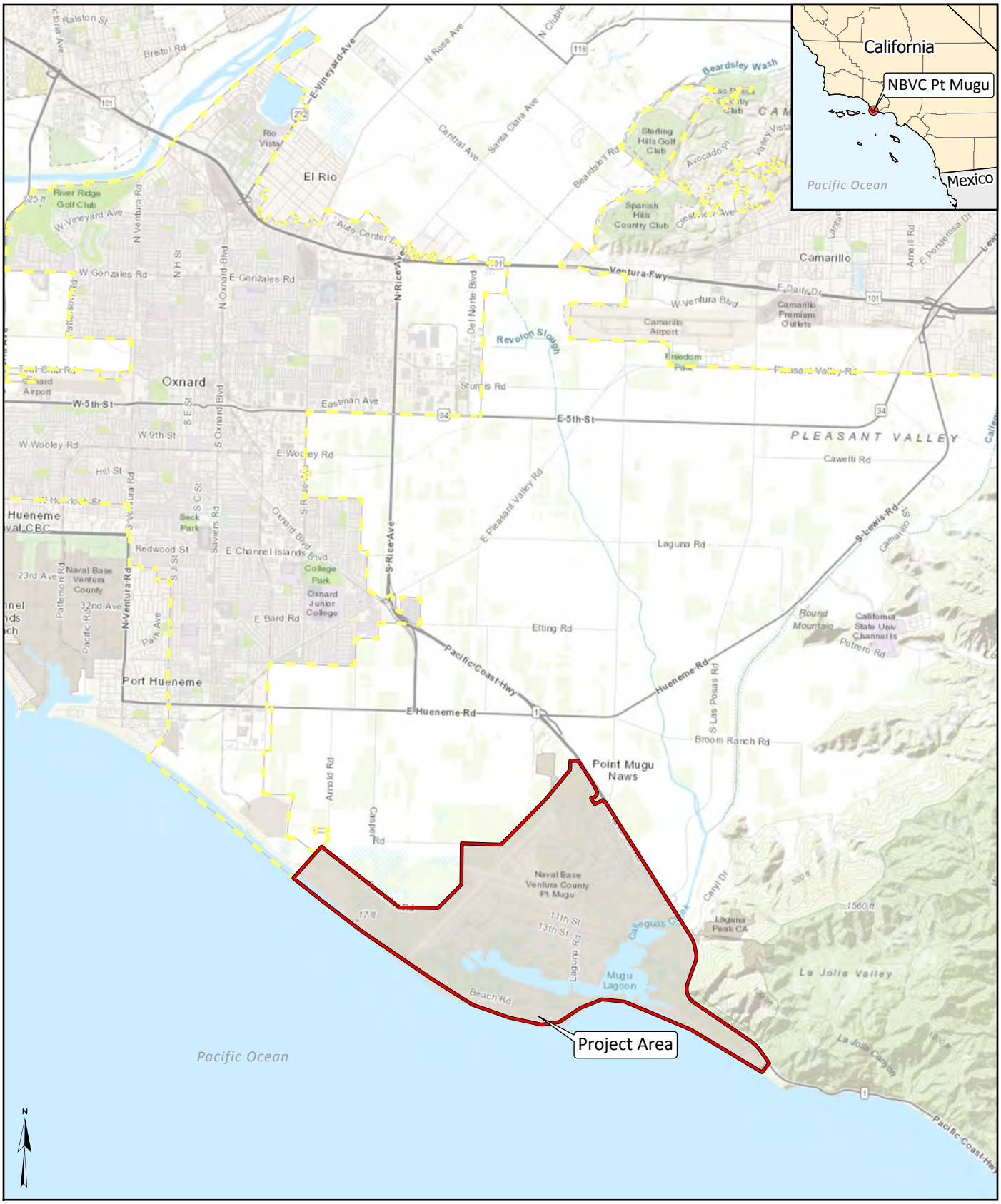

Figure 1-1 Location Map

1.3.1 Lasers

A laser is a speed of light tool used to heat the surface of a target to the point that it fails or until energetic components ignite. Lasers have already proven to be critical communications and targeting tools. Lasers offer the potential to accomplish area defense, aircraft self-protection, strategic and tactical missile defense, and precision strike. As enemy missiles and other forms of ordnance become faster and more elusive to current defensive weapons on ships, high-power lasers show promise as capable of defeating them; however, before lasers can be effectively used as weapons to augment guns and anti-missile weapons on ships, their performance and suitability must be demonstrated in a marine environment (Navy, 2015b).

1.4 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to support current and future DE weapon testing programs at DESIL in order to accelerate the Navy's efforts to deliver laser systems to warfighters. The Proposed Action is needed to further the Navy's DE Test Program with land-based laser target sites in an operationally relevant maritime environment.

1.5 Scope of Environmental Analysis

The Navy has prepared this EA in accordance with NEPA, as implemented by the CEQ regulations and Navy regulations for implementing NEPA. This EA includes an analysis of potential environmental impacts associated with two action alternatives and the No Action Alternative. The environmental resource areas analyzed in detail in this EA include air quality, biological resources, coastal resources, and water resources.

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 may only include the construction footprint of a building whereas the air quality study area would expand beyond the Proposed Action footprint to include areas where airborne pollutants may occur.

10 U.S.C. section 8062: "The Navy shall be organized, trained, and equipped primarily for prompt and sustained combat incident to operations at sea. It is responsible for the preparation of naval forces necessary for the effective prosecution of war except as otherwise assigned and, in accordance with integrated joint mobilization plans, for the expansion of the peacetime components of the Navy to meet the needs of war."

1.6 Key Documents

The Navy has prepared NEPA environmental documents (e.g., EAs, Environmental Impact Statements [EISs]) that have addressed the potential environmental impacts of construction and operation to support the use of lasers from land-to-sea and sea-to-sea operations. The following related environmental documents are sources of information that were used in this EA. These are related documents because of similar actions, analyses, or impacts that may apply to this Proposed Action.

- *Point Mugu Sea Range Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS)* (Navy, 2002). In 2002, the Navy (Naval Air Warfare Center Weapons Division) prepared an EIS/OEIS that analyzed potential impacts associated with Theater

Missile Defense test and training activities and an increase in the level of both Fleet training exercises and special warfare training. In addition, the EIS/OEIS analyzed the modernization of facilities at Point Mugu and San Nicolas Island to increase the PMSR's capability to support existing and future operations. The EIS/OEIS and Record of Decision were completed in 2002. The Navy is currently consolidating the previously analyzed actions in the 2002 PMSR Final EIS/OEIS, which is further described below under the 2020 PMSR EIS/OEIS.

- *Environmental Assessment/Overseas Environmental Assessment Laser Testing & Training Point Mugu Sea Range* (Navy, 2010). In June 2010, the Navy prepared an EA/OEA to address an increase in test, evaluation, and training use of advanced weapons technology on the PMSR to characterize performance and to identify and resolve issues associated with laser technology, including Class 1, 2, 3, and 4 lasers.
- *Environmental Assessment for Shoreline Protection Repair and Enhancements NBVC Point Mugu* (Navy, 2016). In March 2016, the Navy analyzed the potential environmental impacts to repair and enhance shoreline protection structures for the purpose of protecting mission-critical infrastructure (buildings and roads) from the effects of coastal flooding and damage from waves along the NBVC Point Mugu coastline. The project included, in part, repairing and expanding Central and West revetments, and repairing and repaving Beach Road.
- *Environmental Assessment, Point Mugu Sea Range Countermeasures Testing and Training* (Navy, 2014). In 2014, the Navy (Naval Air Systems Command) prepared an EA for Point Mugu Sea Range Countermeasures for conducting additional types of countermeasures testing on the PMSR at NBVC Point Mugu and San Nicolas Island. This document addresses the use of lasers and other systems designed to function in a defensive or preemptive manner, to intercept, deflect, deceive, deactivate, or destroy approaching threats, commonly termed countermeasures. A finding of no significant impact (FONSI) was signed in July 2014.
- *Environmental Assessment for Directed Energy Systems Integration Laboratory at NBVC Point Mugu* (Navy, 2019a). In 2019, the Navy prepared an EA that examined the environmental impacts of constructing the DESIL at NBVC Point Mugu "2019 DESIL EA." The DESIL will provide a land-based facility adjacent to the PMSR to support necessary research, development, test, and evaluation (RDAT&E) of DE lasers in support of the Surface Navy Laser Weapon System Program and future Navy DE Programs. The DESIL facility will be in close proximity to a marine environment to mimic ship operations of the DE lasers. DE lasers and high-powered microwave systems operations conducted from the DESIL to the PMSR are covered in the PMSR EIS/OEIS. The DESIL construction began in May 2020 and is expected to be operational in 2021.
- *Final Integrated Natural Resources Management Plan, Naval Base Ventura County Point Mugu and Special Areas (*Navy, 2019b). The Integrated Natural Resources Management

Plan (INRMP) is the Navy's long-term planning document to guide the installation commander in the management of natural resources to support the installation mission, while protecting and enhancing installation resources for Naval Air Systems Command multiple use, sustainable yield, and biological integrity. The NBVC Point Mugu and Special Areas INRMP includes all lands owned, leased, withdrawn, or otherwise used for the Navy mission by NBVC, except for NBVC San Nicolas Island and NBVC Port Hueneme.

- *Point Mugu Sea Range Draft EIS/OEIS* (Navy, 2020a). The Navy is conducting an EIS/OES assessing the potential environmental consequences of continuing military readiness activities addressed in the 2002 PMSR EIS/OEIS. In addition to consolidating previously analyzed actions into one comprehensive document, it also addresses proposed increases in activity frequency of military RDAT&E. The PMSR Draft EIS/OEIS was published for public comment in April 2020.

1.7 Relevant Legal Requirements and Policies

The Navy has prepared this EA based upon federal and state laws, statutes, regulations, and policies pertinent to the implementation of the Proposed Action. A description of the Proposed Action's consistency with these laws, policies, and regulations, is presented in Section 4, Table 4-1.

1.8 Public and Agency Participation and Intergovernmental Coordination

The Navy informed the public of the Proposed Action and allowed the opportunity for public review and comment of the Draft EA. The Draft EA review period began with a public notice of availability published in the Ventura County Star (8 and 10 October 2020) and La Vida Newspaper (8 October 2020) indicating the availability of the Draft EA. The notice of availability described the Proposed Action, solicited public comments on the Draft EA, provided dates of the 15-day public comment period, and announced that a copy of the EA was available electronically via the Navy Region Southwest website (https://www.cnic.navy.mil/navysouthwestprojects). Due to COVID-19 restrictions a hard copy was not available for review at the Ray D. Prueter Public Library but requests for hard copies could have been submitted via e-mail to benjamin.t.lawrence@navy.mil or by calling 619-532-4438. The public comment period was 9 October 2020 to 23 October 2020 and no comments were received.

The Navy consulted with the California Coastal Commission in accordance with the Coastal Zone Management Action (see Appendix A) and with U.S. Fish and Wildlife Service (USFWS) in accordance with Section 7 of the Endangered Species Act (ESA).

2 Proposed Action and Alternatives

2.1 Proposed Action

The Navy proposes to construct a land-based LATS building at NBVC Point Mugu (Figure 2-1) and to conduct laser testing operations between the newly constructed LATS building and mobile targets at the existing Nike Zeus and Alpha Pads.

2.2 Screening Factors

Potential alternatives that met the purpose and need were evaluated against these screening factors:

- *Located at or Near Shore*. The sites must be located at or near the shoreline, for the purpose of mimicking shipboard operations in a maritime environment (e.g., foggy conditions).
- *Line-of-Sight*. The land-based laser target sites must be located within the line-of-sight of the DESIL, have no severe obstructions (i.e., permanent structures) within the beam path, with a goal of being located approximately two km away.
- *Adequate Size*. The site footprint must have adequate size to accommodate a 400- to 500-square-foot building, vehicle parking, and mobile equipment on concrete pads.
- *Compatibility*. The location of the land-based laser target sites must be compatible with surrounding land uses and existing operations.
- *Controlled Access*. Access to the area between DESIL and the target sites must be easily limited during operations using roadway "drop arm" barriers.

As mentioned in screening criteria one, the Proposed Action must be located in an operationally realistic maritime environment. Laser testing is needed to understand how lasers perform differently in different environments, particularly at sea and near water where the Navy operates. Even though laser or coherent light remains in a tight beam, its energy is quickly absorbed or scattered by moisture and distorted by density and temperature variations that affect the refractive index of air (Navy, 2015b). Accordingly, one of the screening factors requires that the land-based laser target sites be located at or near the shoreline for the purpose of mimicking shipboard operations in a maritime environment.

Using these factors, the Navy also conducted a line-of-sight analysis and further defined and evaluated potential optimal locations for the land-based laser target sites. The Navy initially identified five candidate locations: Building 57-A, Building 57-B, Building 57-C, Nike Zeus Pad, and the proposed construction of a land-based laser target site at L Avenue.

The Navy analyzed each candidate target site and respective lines-of-sight from two points of origin for laser projection from the DESIL building: one on the roof of the building and another from a truck-mounted system that would be tested from the ground adjacent to the DESIL building.

Obstructions identified were considered a point of concern. Examples of obstructions included light poles, electrical poles with attached overhead lines, and buildings. For a site to be acceptable, it needed to have an achievable clear line-of-sight from both points of origin (roof and truck). If a severe obstruction was present, regardless of the point of origin, the target site was considered not feasible and no further analysis was undertaken.

Of the five possible locations considered for the target sites, two areas were identified as the optimal land-based laser target sites: L Avenue and Nike Zeus Pad as they best met the screening factors. In addition, Alpha Pad was later identified as a feasible mobile target site, as it also met the screening factors. See Figures 2-1 and 2-2.

Locations other than NBVC Point Mugu were considered thoroughly in the 2019 DESIL EA. The 2019 DESIL EA discussed other Department of Defense (DoD) locations and other Federal properties that were determined to avoid potential conflicts with land uses and to maximize compatibility with existing operations. These locations include Naval Surface Warfare Center Dahlgren, Pacific Missile Range Facility, Naval Air Weapons Station China Lake, Naval Base Point Loma, NBVC Point Mugu, National Aeronautics and Space Administration Wallops Island, White Sands Missile Range, Eglin Air Force Base, and Joint Base Little Creek/Fort Story. Sites that are not at or near the shoreline and do not have direct access and clear line-of-sight to a Navy/DoD sea range were eliminated leaving four locations: Eglin Air Force Base, National Aeronautics and Space Administration Wallops Island, NBVC Point Mugu, and NBVC San Nicolas Island.

Of the four locations, NBVC Point Mugu met the purpose and need of the DESIL Proposed Action and all screening factors. None of the other locations met all screening factors. As such, these locations are not discussed in this EA for further consideration.

Figure 2-1 Location of Proposed Land-Based Laser Target Sites

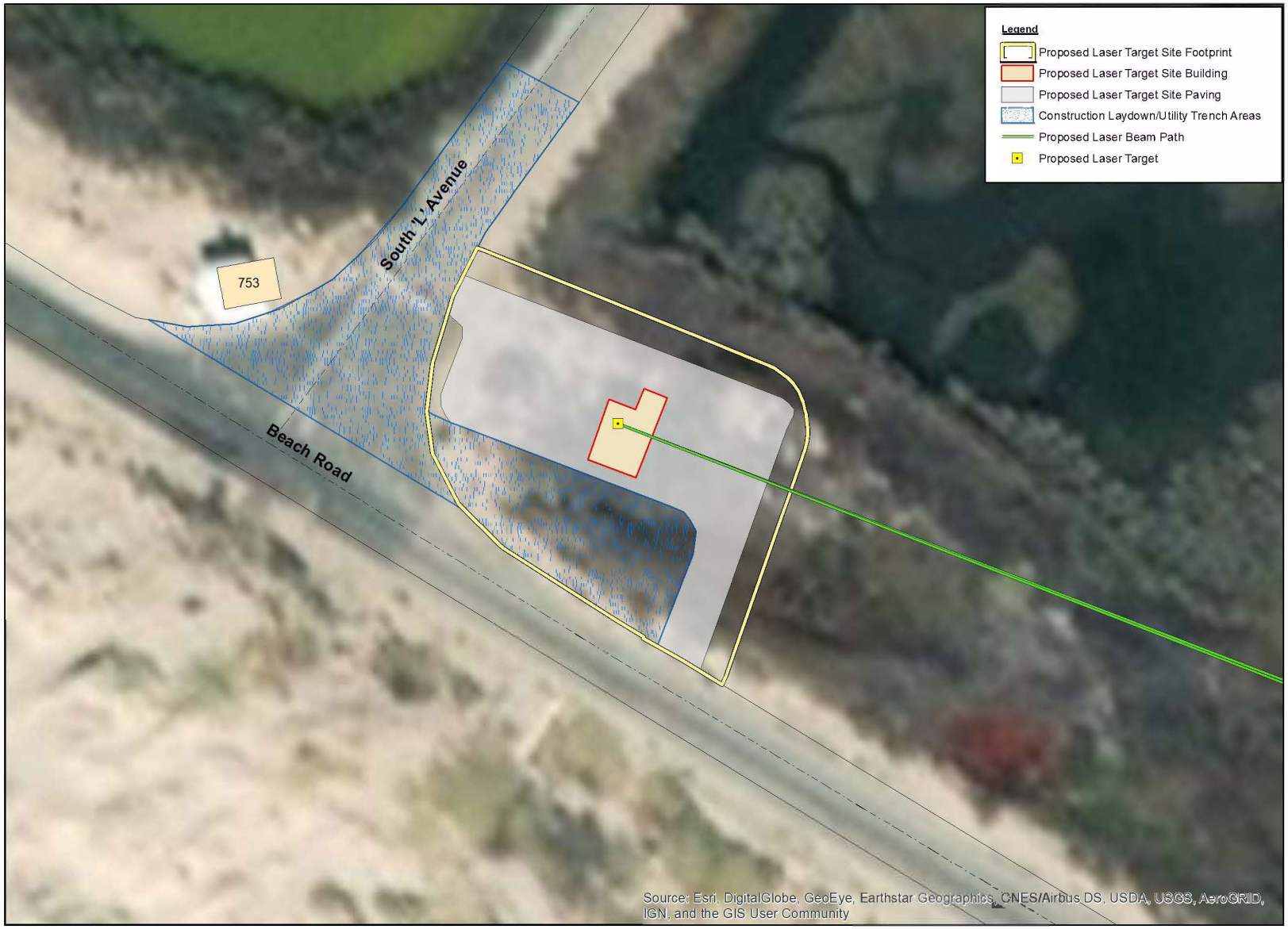

Figure 2-2 L Avenue Land-Based Laser Target Site

2.3 Alternatives Carried Forward for Analysis

Based on the reasonable alternative screening factors and meeting the purpose and need for the Proposed Action, the Navy has carried forward two action alternatives and the No Action Alternative for evaluation in this EA.

Table 2-1 summarizes the alternatives. Sections 2.3.1 through 2.3.3 describe the alternatives in detail.

Table 2-1 Summary of Alternatives

No Action Alternative	*Alternative 1*	*Alternative 2*
No construction would occur.	Construct a new, 400 to 500 square feet permanent one-story, 15 to 18 feet high, fully instrumented LATS building on the northeastern corner of L Avenue at the intersection of Beach Road.	Construct a concrete pad only (no building) to establish a dedicated LATS building for placement and use of mobile laser targets on the northeastern corner of L Avenue at the intersection of Beach Road. Includes electrical power and communications circuits.
Drop arms across roadways would not be installed.	Install five drop arms at South L Avenue at the 18th Street intersection, Beach Road at South M Avenue, Beach Road on the western side of G Avenue intersection, 20th Street, west of G Avenue, and the entrance to Surfer Beach.	Install drop arms as described for Alternative 1.
No land-to-land testing and calibration would occur.	Conduct land-to-land laser operations* from the DESIL to the L Avenue LATS building and the existing Nike Zeus and Alpha Pads mobile target sites.	Conduct land-to-land laser operations* as described for Alternative 1.
* Initial laser testing may occur a few times per year and may increase over time up to 116 days a year but may be lower depending on operational requirements, test objectives, and scheduling availability.		

2.3.1 No Action Alternative

Under the No Action Alternative, the proposed land-based permanent LATS on L Avenue would not be constructed, and land-to-land DE operations RDAT&E would not occur. The No Action Alternative would not meet the purpose and need for the Proposed Action; however, as required by NEPA, the No Action Alternative is carried forward for analysis in this EA. The No Action Alternative is used to analyze the consequences of not undertaking the Proposed Action and provides a comparative baseline for measuring the environmental consequences of the action alternatives.

2.3.2 Alternative 1

Alternative 1 would result in the new construction of a fully instrumented LATS building at L Avenue and would also include operation of land-to-land DE operations from the DESIL to the new LATS building and two land-based mobile target sites located at the existing Nike Zeus and Alpha Pads (Figure 2-1).

2.3.2.1 Proposed Construction

The Navy would construct a new LATS building consisting of a 400- to 500-square-foot, one-story, 15- to 18-foothigh structure that would house electro-optical instrumentation for the characterization of laser

beams, to perform studies, and to verify laser system operations prior to live test and evaluation events on the PMSR. The new LATS building would be located on the northeastern corner of L Avenue at the intersection of Beach Road.

This permanent structure would be located within the line-of-sight of DESIL, approximately two km to the southeast within NBVC Point Mugu. Site preparation for the L Avenue LATS would include construction laydown, clearing, excavation, and preparation for construction. Paving and site improvements would consist of mobile equipment pads, parking, and stormwater management infrastructure (Figure 2-2). The Navy proposes construction of up to a 6,000-square-foot area with driveway access. The resulting improvements would consist of the following features:

Target Bays: The LATS building would include two target bays in which targets and electro-optical instrumentation could be set up for illumination by laser systems. It would also contain a separate Instrument Control Room, protected from laser energy, for operators to control/monitor equipment during lasing and accomplish data capture.

Concrete Pads: The LATS building would have two adjacent mobile equipment concrete pads, one in front of the target bays a minimum of 40 feet wide, and the second on the rear side of the structure a minimum of 16 feet wide. Parking would be provided for a minimum of four vehicles. Mobile instrumentation/targets could also be located at the laser target sites for use by laser systems at DESIL.

Utilities: The LATS building would have potable water service to support maintenance activities. Electrical utilities would include primary and secondary electrical distribution systems, interior and exterior lighting, and telecommunications infrastructure.

Drop Arms: Alternative 1 would also include installing five manually operated drop arms across area roads to limit access to the area between the DESIL and the target sites during laser operations. The drop arms would have a height of approximately 15 to 18 feet. As shown on Figure 2-1, the drop arms would be installed at South L Avenue at the 18th Street intersection, Beach Road at South M Avenue, Beach Road on the western side of G Avenue intersection, 20th Street west of G Avenue, and the entrance to the improved roadway for Surfer Beach access. Two currently existing drop arms may be refurbished, which would reduce the number of new manually operated drop arms from five to three.

Construction Duration: Construction of Alternative 1 is anticipated to occur over approximately a 2 to 3-month period at the L Avenue LATS.

2.3.2.2 Proposed Operations

The Navy proposes to conduct land-to-land laser testing from the DESIL to the proposed LATS building and two additional land-based mobile target sites at NBVC Point Mugu: Nike Zeus Pad and Alpha Pad. The Nike Zeus Pad and Alpha Pad are existing structures currently used in support of other testing activities conducted on the PMSR. No construction, modifications, or improvements are planned for Nike Zeus Pad and Alpha Pad. Both Nike Zeus and Alpha Pads have existing access roads to allow the delivery of mobile targets and other necessary instrumentation. Under Alternative 1, laser systems would be operated from the roof of the DESIL, or from a trailer in the rear yard of DESIL, and directed at targets at the L Avenue LATS and at the Nike Zeus and Alpha Pad land-based mobile target sites. The roof-mounted laser would be approximately 66 feet above the ground, and the trailer mounted laser would be approximately 27 to 35 feet above the ground.

Types of Laser Systems

Lasers are being continually developed and refined with new tempos, operational characteristics, and beam sizes being developed on a regular basis. The Navy proposes testing two general types of laser systems at DESIL, HELs and Lower Power Lasers. Typically, Lower Powers Lasers (e.g., Dazzlers or target illumination lasers [TIL]) use a beam width up to two meters, whereas an HEL employs a more focused beam with a typical width of 10 to 50 centimeters. For the purposes of this analysis, the Navy assumed a beam width up to 20 centimeters for HEL. This width represents the most likely beam size, which would be used at DESIL. Further information on HELs and Lower Power Lasers is described below and in Table 2-2.

1. High Energy Lasers (HEL):
    - An HEL is intended to destroy its target by focusing laser energy on a specific point on the target. Maintaining focused energy on a specific point on a target is intended to disable or destroy some aspect of that target. Operational, meteorological, and logistical factors would determine the timing of HEL operations. HELs typically operate for a period of 10 seconds at a time. At DESIL, HELs would likely engage a target at a target site for a period of 10 seconds at a time and an estimated cumulative operating time of 5 minutes in a 24-hour period.
    - Typically, an HEL system employs a secondary laser to improve the system's ability to track a target. Target tracking must be very precise for laser weapons. A TIL functions as a big "flashlight" to illuminate the target. A TIL system would likely illuminate a target for a longer period than the HEL, likely several minutes.
2. Lower Power Lasers (Dazzlers or TILs):
    - A Dazzler is a Lower Power Laser system that is not intended to destroy a target. Instead, its purpose is to dazzle or "confuse" an imager on an adversary's surveillance asset. Dazzlers or TILs typically operate for a period of 10 minutes at a time. At DESIL, Dazzler systems would likely engage a target at a target site for a period of tens of minutes at a time and an estimated cumulative operating time of 30 minutes in a 24-hour period.
    - A Dazzler system might also employ a secondary TIL. The TIL system could likely illuminate a target for a longer period than the Dazzler. In no case would multiple HEL or Dazzler systems be used simultaneously. Additional technical components of proposed laser operations are described in Table 2-2.
    - Lower Power Lasers may use the visual spectrum of light waves whereas the typical HEL uses the infrared spectrum of light waves.

Table 2-2 Proposed Operational Components and Activities

Activity	*Activity Description*
GENERAL	

Laser Components	• Class 1, 2, 3, and 4 lasers.
	• Class 4 HEL:
	  ○ Power up to a maximum of 1 megawatt (average).
	  ○ Typical Beam Hazard Width 20 centimeters.
	• Lower Power Lasers (e.g., Dazzlers, TILs):
	  ○ Power up to 1 kilowatt (average).
	  ○ Typical Beam Hazard Width 2 meters.

Target Components	• Mobile Land-Based Laser Targets: Standard container express (CONEX) boxes (i.e., metal bulk shipping containers) at Nike Zeus Pad, Alpha Pad, or L Avenue LATS.
Personnel	• Generally, up to 8 to 10 personnel during each event.
OPERATION	
Tempo	• Estimated tempo of 116 days/year, including some events occurring during the nighttime.
Event Duration	• Typical test event duration would be several hours or more in a 24-hour period. Multiple lasers could be operated within an event. Typical event duration time would include the initial set-up, road closure, testing, all-safe, then road opening. Roads between drop arms could have limited access approximately 90 minutes in a 24-hour period.

Laser Usage per Event	• Multiple pulses, varying for a period of seconds but may be up to a period of tens of minutes.
	• Class 4 HEL:
	  ○ Estimated cumulative laser operating time: 5 minutes in a 24-hour period.
	  ○ Estimated tempo of laser operations: 58 days/year.
	• Lower Power Lasers (e.g., Dazzlers, TILs):
	  ○ Estimated cumulative laser operating time: 30 minutes in a 24-hour period.
	  ○ Estimated tempo of laser operations: 58 days/year.

Test Event Activities	• Pre-event • Approved Test Plan for each Test Event. • Range Safety Approval. • Transportation of CONEX boxes, and instrumentation to test facilities via tractor-trailer. Unloading of CONEX boxes, and instrumentation using a crane or forklift. System set-up, alignment, calibration, and check-out (approximately 2 hours per event). • Event • Clearance of any personnel associated with the test to a safe facility during testing. • Clearance of non-event-related personnel from the area, and closure of drop-arms during laser firing events. • Laser firing from DESIL to a target site, and data acquisition activities. • Post-event • De-install and package system, CONEX boxes, and instrumentation for transport on tractor trailers, and depart site.
Generator and Mobile Chiller	• 20 kilo-volt-ampere generator (or multiple smaller generators) and/or a mobile chiller at target site, for pre-event, laser operations, and post-event activities, up to 10 hours/day.

Tempo: Under the Proposed Action, laser operations would occur up to 116 days per year. Some of these operations may occur at night. Initial laser testing may occur a few times per year and may increase over time up to 116 days a year but may be lower depending on operational requirements, test objectives, and scheduling availability. The cumulative operating time of HEL and Lower Power Laser use is not anticipated to exceed 34 hours per year.

Personnel: Personnel requirements for each event would vary by the type of test. On average, 8 to 10 personnel would be required for engaging land-based targets from DESIL.

Vehicle Use: Tractor trailers would transport the target enclosure and instrumentation to the mobile target sites as part of pre-event set-up and post-event tear-down. Pick-up trucks for personnel and equipment transportation pre-event, during the event, and post-event. A 4-wheel drive forklift and/or crane would be used for loading and unloading.

2.3.3 Alternative 2

Alternative 2 would be the same as Alternative 1, except no construction of the LATS building would occur. The Navy would instead construct a concrete pad at L Avenue to establish a dedicated land-based laser target site for mobile laser targets only. Operations at Nike Zeus and Alpha Pad would also occur. Under Alternative 2, the same drop arm locations, existing target site use, and operations tempo would occur as described under Alternative 1.

Under Alternative 2, the Navy would construct a concrete pad with driveway access (up to 6,000 square feet) at the northeast corner of L Avenue at the intersection of Beach Road for use as a land-based mobile target site similar to the existing Nike Zeus and Alpha Pads. Temporary backstops would be provided to contain laser energy during test events. Utilities, such as electricity, natural gas, water/wastewater, and telecommunications, would be installed.

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 because they did not meet the purpose and need for the project and/or satisfy the screening factors (e.g., clear line-of-sight) presented in Section 2.2. All three Building 57 sites described below are located to the north of the DESIL across the Point Mugu marsh and sit at an elevation of roughly 9 feet above sea level (asl).

2.4.1 Building 57–A Target Site

The Building 57-A target site is located approximately 4,680 linear feet from the point of origin. This potential target site presented several obstructions from both points of origin. Therefore, Building 57-A is not being carried forward for detailed analysis in this EA.

2.4.2 Building 57-B Target Site

The Building 57-B target site is located approximately 4,485 linear feet from the point of origin. This potential target would present obstructions from both points of origin. The obstructions cannot be removed. Therefore, Building 57-B is not being carried forward for detailed analysis in this EA.

2.4.3 Building 57-C Target Site

The Building 57-C target site is located approximately 4,270 linear feet from the point of origin. Building 735 is within the line-of-sight and presents an obstruction and is in direct conflict with the laser beam from both points of origin. Therefore, Building 57-C is not being carried forward for detailed analysis in this EA.

2.5 Existing and Proposed Activities

The existing Alpha and Nike Zeus Pads are currently used as electronic support systems and as calibration sites and mobile shooter sites for the PMSR Countermeasures. They are also used for missile launching and small arms firing for PMSR Countermeasures. The proposed L Avenue LATS at the southeastern corner of L Avenue at the Beach Street intersection is vacant, previously disturbed, and is not currently used for military operations.

3 Affected Environment and Environmental Consequences

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 effects of each alternative.

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

The updated NEPA regulations published on 16 July 2020 clarified how to determine potential impacts and the meaning of "significant impact" (Code of Federal Regulations [CFR] 1501.3):

> *(b) In considering whether the effects of the proposed action are significant, agencies shall analyze the potentially affected environment and degree of the effects of the action. Agencies should consider connected actions consistent with 40 CFR 1501.9(e)(1).*
>
> *(1) In considering the potentially affected environment, agencies should consider, as appropriate to the specific action, the affected area (national, regional, or local) and its resources, such as listed species and designated critical habitat under the Endangered Species Act. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend only upon the effects in the local area.*
>
> *(2) In considering the degree of the effects, agencies should consider the following, as appropriate to the specific action:*
>
> *(i) Both short- and long-term effects.*
>
> *(ii) Both beneficial and adverse effects.*
>
> *(iii) Effects on public health and safety.*
>
> *(iv) Effects that would violate Federal, State, Tribal, or local law protecting the environment.*

The 2019 DESIL EA (Navy, 2019a) analyzed the potential impacts of constructing the DESIL facility. The operation of lasers from NBVC Point Mugu to the adjacent PMSR had previously been evaluated in the 2014 Point Mugu Sea Range Countermeasures Testing EA (Navy, 2014). The action proponent determined that the DESIL construction would have no significant impact as documented in a FONSI signed August 2019. As construction of the DESIL has been analyzed in the above referenced document, it is not discussed further in this EA.

This section includes a detailed analysis of the following resource areas: air quality, biological resources, coastal resources, and water resources. Potential impacts on certain resources were determined to be negligible or nonexistent; therefore, this EA did not evaluate the following resources in detail.

Geological Resources: The proposed L Avenue LATS has been previously disturbed. Depending on the final engineering design, the site may be raised one to three feet using imported clean fill. Best

Management Practices (BMPs), including silt fencing, fiber rolls, and minimizing points of access to the construction site, would be implemented to minimize soil erosion potential. The Navy would adhere to applicable state laws for erosion and sediment control and would monitor the effectiveness of temporary erosion control measures. Implementation of the Proposed Action would have a negligible impact to geological resources. Under the No Action Alternative there would be no change to existing conditions. Accordingly, geological resources is not carried forward for detailed analysis in this EA.

Marine Biological Resources: The proposed L Avenue LATS and the existing land-based mobile target sites are all located entirely within uplands outside of marine or estuarine habitats. No impacts to marine species during operations would occur because lasers would only engage land-based targets. BMPs such as managing stormwater runoff during construction would be implemented to prevent sedimentation or the introduction of pollutants to ensure no impacts to the adjacent Mugu Lagoon, Pacific Ocean, or its marine resources. Therefore, implementation of the Proposed Action would not affect marine biological resources. Under the No Action Alternative there would be no change to existing conditions. Accordingly, marine biological resources are not carried forward for detailed analysis in this EA.

Cultural Resources: The proposed land-based L Avenue LATS has been previously disturbed and was previously partially covered with modern fill. The placement of new drop arm gates would require minimal exaction of previously disturbed areas. The proposed ground disturbance would be contained within the modern fill placed on top of native soils; therefore, the likelihood of encountering archaeological resources is minimal. No built environment resources that are considered historic properties, per the National Historic Preservation Act, occur within the project area. In addition, the proposed use of Nike Zeus and Alpha Pads are existing sites where temporary container express (CONEX) boxes would be placed and would not involve ground disturbance. The Proposed Action is outside the areas identified as sensitive for cultural resources. Therefore, the Proposed Action is a project that has low to no probability of impacting sensitive cultural resources.

An NBVC-authorized archaeological monitor would be present during construction. Any inadvertent discovery of archaeological materials would be handled in accordance with the Navy's management practices, which include provisions for stopping work and notifying the appropriate parties. If human remains are inadvertently discovered, then the procedures established under the Native American Graves Protection and Repatriation Act and Office of the Chief of Naval Operations Instruction 11170.2 series, *Navy Responsibilities Regarding Undocumented Human Burials*, would be followed.

NBVC signed a Programmatic Agreement in 2015 with the California State Historic Preservation Office (SHPO) regarding Navy undertakings within Ventura County; the proposed L Avenue LATS is a project covered under this Programmatic Agreement (Navy, 2015a). The NBVC Cultural Resource Program Manager reviewed the Proposed Action and determined that it can be approved with a finding of "No Historic Properties Affected" consistent with Stipulation 8A of the 2015 NBVC Programmatic Agreement and 36 CFR 800.4(d)(1). The Proposed Action would be reported to the California SHPO as part of NBVC's annual reporting, per the 2015 Programmatic Agreement. Therefore, implementation of the Proposed Action would not affect cultural resources. Under the No Action Alternative there would be no change to existing conditions. Accordingly, cultural resources is not carried forward for detailed analysis in this EA.

Visual Resources: The Proposed Action would construct a new, 400 to 500 square feet permanent one story, 15 to 18 feet high LATS building on the northeastern corner of L Avenue (Alternative 1) or construct a concrete pad (Alternative 2) at the same location for mobile laser targets immediately east of a large revetment (retaining wall of boulders) adjacent to the Pacific Ocean. The introduction of one building or a concrete pad would be visually compatible with the military-related infrastructure and the viewshed already present in the existing visual environment within the context of the immediate setting and NBVC Point Mugu as a whole. The design of the proposed LATS building would also be consistent with the Installation Appearance Standards contained in the NBVC Installation Development Plan (Naval Facilities Engineering Command Southwest [NAVFAC SW], 2017) as well as existing buildings in terms of building form, scale, style, architectural treatments, materials, and colors. In addition, there are no sensitive visual receptors in the vicinity of the Proposed Action because the project is located on a military installation. Proposed drop arms would be visually consistent with ones currently on base. The proposed temporary placement of CONEX boxes on Nike Zeus and Alpha Pads would be visually consistent with current activities at the pads which have existing buildings. Therefore, implementation of the Proposed Action would not affect visual resources. Under the No Action Alternative there would be no change to existing conditions. Accordingly, visual resources is not carried forward for detailed analysis in this EA.

Noise: Aircraft noise tends to be the dominant noise source in areas immediately adjacent to airfields and beneath primary flight corridors (NAVFAC SW, 2015). Noise associated with heavy equipment (e.g., backhoes, bulldozers, etc.) is anticipated to range from 74 to 90 decibels at 50 feet. The predominant noise at NBVC Point Mugu is generated from airfield operations. The action area is located less than one mile from the NBVC Point Mugu airfield and within the Air Installation Compatible Use Zone (AICUZ) noise contours (75 decibels and 80 decibels) (NAVFAC SW, 2015). Noise from the Proposed Action activities would primarily be generated from equipment and vehicles used during construction activities. This noise would be temporary, lasting approximately two to three months during construction at the proposed L Avenue LATS. Although the testing of lasers is relatively quiet, some laser systems may emit a crackling sound, depending on atmospheric conditions. During the operational phase of the Proposed Action, prior to testing various types of warning systems there would be visual warning lights on DESIL. No audible sirens or alarms would be used. Aircraft generated noise would continue to dominate the noise environment. Therefore, implementation of the Proposed Action would result in negligible impacts to the noise environment. Under the No Action Alternative there would be no change to existing conditions. Accordingly, noise is not carried forward for detailed analysis in this EA.

Infrastructure: Proposed construction at the L Avenue LATS would require a tie-in or connection to existing nearby utilities; however, it would not require removing or altering the existing adjacent building PM753 (High Voltage Shed). Existing utilities have sufficient capacity to support the negligible increase in demand by the proposed operations. The Navy performed a line-of-sight analysis on the projected laser beam path from the DESIL to the proposed target sites. The line-of-sight analysis identified a few minor or moderate obstructions (guy wires, light poles, overhead electric lines) and no severe obstructions (buildings, communication towers, etc.) within the projected laser beam paths. Any minor or moderate obstructions determined to be in the final laser beam paths would be relocated to completely eliminate the minor or moderate obstructions and provide clear line-of-sight within the

projected laser beam paths. Therefore, implementation of the Proposed Action would result in negligible impacts to existing infrastructure. Under the No Action Alternative there would be no change to existing conditions. Accordingly, infrastructure is not carried forward for detailed analysis in this EA.

Transportation: The Proposed Action would not require the construction of new roads. In addition, no new access gates or entry control points to NBVC Point Mugu would be required. All construction trucks would be anticipated to enter and exit the installation through the Las Posas Gate. During construction of the Proposed Action there would be a short term and minor increase in truck traffic (4 to 6 additional vehicles every working day). Construction is anticipated to occur over approximately a 2 to 3-month period at the L Avenue LATS.

During laser, post-laser operations and maintenance activities, on average 8 to 10 personnel would be present at the L Avenue LATS and mobile target sites. Personnel would include NSWC PHD staff and associated contractors. This negligible increase in personnel would not noticeably increase daily traffic that would adversely affect roadways on NBVC Point Mugu or in the vicinity.

As part of the Proposed Action, five new manually operated drop arms would be installed. The manually operated drop arms would be lowered during laser operations to limit access to the area between the DESIL and the land-based laser target sites. The roads between the drop arms are located in areas that are not commonly traveled to access base housing, lodging, eateries, or main access gates. Roads would be blocked for a certain amount of time during operations. The temporary closures would last approximately 90 minutes within a 24-hour period in order to balance public safety and access to roadways. In addition, a traffic control plan and detour plan would be developed and communicated with the base in advance to provide notification and other route options.

Beach Road runs parallel to the Proposed Action and is an Explosive Ordnance Transportation Route. The Beach Road Explosive Ordnance Transportation Route would not be affected by construction or operations. During construction, a Traffic Control Plan would be implemented to ensure Beach Road remains open or accessible to routine explosive ordnance transportation activities. During operations, the Navy would coordinate with the NBVC Explosive Safety Officer and would plan ordnance transportation activities deconflict with laser operations. While L Avenue is an alternate Explosive Ordnance Transportation Route, other alternative routes would be available. Effects would remain negligible and would be similar to other target operations on NBVC Point Mugu. Therefore, implementation of the Proposed Action would result in a negligible impact to transportation. Under the No Action Alternative there would be no change to existing conditions. Accordingly, transportation is not carried forward for detailed analysis in this EA.

Socioeconomics/Environmental Justice: Implementation of the Proposed Action would not adversely affect socioeconomic resources and would comply with Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations* and EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*. The Proposed Action would occur entirely on Navy lands. No minority or low-income communities are known to exist within the vicinity of the Proposed Action, and no such groups would be disproportionately affected. Therefore, implementation of the Proposed Action would not affect socioeconomics/environmental justice. Under the No Action

Alternative there would be no change to existing conditions. Accordingly, socioeconomics and environmental justice are not carried forward for detailed analysis in this EA.

Hazardous Materials and Hazardous Wastes: Hazardous materials or wastes used or produced during construction would be stored, managed, and disposed of in accordance with local, state, and federal regulations and the NBVC Hazardous Waste Management Plan (NBVC, 2015). Under the Proposed Action, the Navy and the construction contractor would take appropriate precautions to properly dispose of materials characterized as hazardous materials or waste. Under the No Action Alternative there would be no change to existing conditions.

Two Installation Restoration Program (IRP) and one Munitions Response Program (MRP) sites are located adjacent to the Proposed Action but do not overlie any areas anticipated for ground disturbance. The Navy has determined that these sites (IRP Site 11, IRP 38, and Anti-Aircraft Range MRP) respectively do not pose an unacceptable risk to humans, are low-threat due to being in the process of closure, or hazards are not present at the site (Navy, 2019a). The final engineering plans for construction and placement of drop arm gates would take into consideration the location of the site and any restrictions regarding access to the IRP and MRP sites. To the extent practicable, the sites would be avoided; however, if the sites would be disturbed, then proper land use controls would be followed.

During laser operations, certain types of laser systems contain hazardous materials or produce hazardous constituents. All laser systems used would be required to be self-contained, are stable in the form of containment, and would not release any hazardous materials or hazardous constituents into the environment.

Targets that are engaged by HEL may emit vapor or smoke or may catch on fire. Metal targets could melt or break into fragments. As a part of required standard operating procedures for safety, land-based laser target sites would be equipped with video cameras to monitor and promptly suppress any potential fires. Fire extinguishers would be provided at all target sites. Debris such as ash or metal fragments would be removed and properly disposed of following each operation. Secondary containment would be used at each target site to ensure any potentially hazardous materials or debris would not leave the site to potentially impact water resources.

It is anticipated that minimal quantities of hazardous materials, hazardous substances, oils, or fuels would be required for operations and maintenance activities. The NBVC Hazardous Materials Management Plan (NBVC, 2015) would be followed for usage and storage of hazardous materials, hazardous substances, oils, or fuels during operations and maintenance activities. NBVC Oil and Hazardous Substance Integrated Contingency Plan and Spill Response Plan would be followed to prevent and control potential spills or releases into the surrounding environment.

Therefore, implementation of the Proposed Action would have a negligible impact to hazardous materials and wastes. Under the No Action Alternative there would be no change to existing conditions. Accordingly, hazardous materials and wastes are not carried forward for detailed analysis in this EA.

Airspace/Airfield Operations: Construction of the Proposed Action would not result in any obstructions to navigation or restrict navigable airspace. The Proposed Action would not require a change in altitude of use or instrument flight rules because no construction elements or operational features would exceed the height of the previously approved DESIL (Navy 2019a). The proposed roof platform to mount laser

systems on the DESIL for laser operations would add approximately 16 feet above the roof. Prior to construction, NBVC Point Mugu would comply with Federal Aviation Administration (FAA) requirements per 14 CFR Part 77 and FAA Form 7460-1, *Notice of Proposed Construction or Alteration*. The proposed construction would also comply with Encroachment Risk Protection factors for noise, sound, glare, lighting, dust, steam, vibration, range/operations, broadband interference, resilience, public safety, protection of users and testing operations/missions.

The Navy's proposed laser operations program at NBVC Point Mugu would be coordinated with the FAA to ensure there would be no potential hazards aircraft from the proposed laser operation. The Proposed Action would not change the existing relationship of the Navy's special use airspace with federal airways, uncharted visual flight routes, and air traffic operations. Laser operations would not require changes to the current approach or departure patterns and would not require a change in runway clear zones. The lasers would be pointed downward from the roof of the DESIL or truck mount, focusing on targets and therefore not presenting a potential hazard to aviators or aircraft. Lasers would not be moved while in operation.

The NBVC Point Mugu AICUZ identifies compatible land uses and aircraft operations, and accident potential zones (APZs) around each of the two airfields at Point Mugu (NAVFAC SW, 2015). These include the Clear Zone, APZ I, and APZ II. APZs extend from the end of the runway, but apply to the predominant arrival and/or departure flight tracks used by the aircraft. APZs are areas where an aircraft mishap is most likely to occur if one occurs. The proposed L Avenue LATS is located 2,263 feet (690 meters) from the airfield at its nearest point and within APZ II for Runway 09/27. Generally, people-intensive land uses (e.g., schools, apartments) are not compatible uses within APZ II (NAVFAC SW, 2015). In 2019, the DESIL structure was evaluated and authorized for construction in APZ II (Navy, 2019a).

Prior to implementation of the Proposed Action, an AICUZ Waiver Request would be prepared and submitted by the Navy. The Navy would evaluate laser systems and test plans to ensure that proper safety measures are in place and that the development and operations would be consistent with the Office of the Chief of Naval Operations (OPNAVINST) 11010.36C, *AICUZ Program*. The Navy would evaluate each test scenario that includes a laser system emitting hazardous energy beyond the boundary of the DESIL to each of the land-based target sites to determine the risk mitigations that are required. Backstops would be installed to prevent a laser from extending beyond a target site should a target be breached. Navy observers would monitor targets at each target site with video and would stop the laser once it breaches the target, or if a fire starts. Fires shall be quickly suppressed to avoid smoke that could cause a visual impairment to aviation.

Given the aforementioned conditions and anticipated potential effects and associated measures, the Navy does not anticipate any adverse impacts to aviators or aircraft flying over or near NBVC Point Mugu. Therefore, implementation of the Proposed Action would have a negligible impact to airfield/airspace operations. Under the No Action Alternative there would be no change to existing conditions. Accordingly, airfield/airspace operations are not carried forward for detailed analysis in this EA.

Land Use: The Proposed Action would not require a change in land use and would not preclude the viability of existing land use activities or the continued use of the area (both on and off installation) and

would be compatible with adjacent land uses. Specifically, the Proposed Action would be compatible with the existing RDAT&E land use designation, per the NBVC Installation Development Plan (NAVFAC SW, 2017).

The Proposed Action would occur within the boundaries of NBVC Point Mugu where access is controlled and restricted (Navy, 2019a).

NBVC Point Mugu recreational beaches are currently restricted to base personnel because of mission activities, range operations, and sensitive natural resources. During laser operations, the proposed drop arm gates would temporarily block access to certain roads and recreational beaches to ensure safety (specifically G Avenue and Beach Road). Based on the location of the proposed drop arm gates, Family Beach may still be accessible via Laguna Road to provide a safe distance from operations while providing recreational access to authorized base swimmers and surfers. Road closures may vary depending on operational needs and scheduling. While the majority of operations could occur during the week, some may occur over the weekend. NSWC PHD would coordinate with the NBVC Point Mugu Command Duty Officer to communicate proposed laser operation scheduling and would strive to limit road closures to recreational beaches to the minimum amount of time possible. Other outdoor recreation activities at NBVC Point Mugu would still be safely accessible during the limited times of beach closures.

For recreational boaters/vessels, public access to the nearshore water adjacent to the shoreline is restricted by an established U.S. Army Corps of Engineers Restricted Area 33 CFR 334.1126 zone, denoted on nautical charts. Access for other activities, such as fishing and surfing, is also controlled by NBVC Instruction 1710.4B, Recreational Use of NBVC Beaches and Beach Front Waterways, which allows for closures due to testing and training (NBVC, 2017). In addition, procedures established, documented and analyzed in the Countermeasures Testing and Training EA are codified in range instructions to inform the public of laser testing through the Notice to Mariners issued for each test event (Navy, 2014). Proposed construction or operations would not encroach upon or affect nearby recreational vessel use.

Therefore, implementation of the Proposed Action would have a negligible impact to land use. Under the No Action Alternative there would be no change to existing conditions. Accordingly, land use is not carried forward for detailed analysis in this EA.

Public Health and Safety: Construction of the proposed L Avenue LATS building or concrete pad would occur entirely within the installation boundaries and would not encroach upon public use areas. Construction would be conducted in accordance with Navy, NSWC PHD, and NBVC regulations and standards. The construction contractor would implement a Health and Safety Plan to ensure appropriate safety measures are implemented during construction. In addition, the L Avenue target location and the proposed drop arms at South L Avenue at the 18th Street intersection and Beach Road at South M Avenue are within the hazard area for PM55 and immediately adjacent to the Jet Assisted Take-Off (JATO) motor impact area. Expended JATO motors may be encountered within the construction footprint. Reconnaissance of the L Avenue site and potential drop arm gate locations would be undertaken by unexploded ordnance personnel to confirm that no JATO motors are present prior to the start of construction. All intrusive construction activities would use anomaly avoidance techniques and be coordinated with the NBVC Explosive Safety Officer.

Safety related to laser operations would include the NSWC PHD Safety office evaluating each laser system and test plan to ensure that proper risk mitigation measures are in place, to include ensuring the area is clear of people before starting an operation. The findings of NSWC PHD Safety would dictate required risk mitigations, including the requirements for closure of roads and beaches. Standard operating procedures would be prepared to ensure safe and efficient use of the facility.

CONEX boxes may, at times be used at LATS, but the primary backstop would be the Target Bays and the building itself. For Nike Zeus and Alpha Pad, target shelters, such as CONEX boxes, and supplementary backstop material would be used to prevent laser energy from extending beyond the target site.

Non-reflective impervious material would be placed inside the CONEX boxes that would prevent lasers from extending beyond the laser target site. Material inside a CONEX box could be used in some cases as a backstop, or some form of backstop could be temporarily erected behind the CONEX box/target enclosure. The form and materials used for temporary backstops might vary. Observers would be able to monitor the target with video and would stop the test should a laser breach the target, or if a fire starts. Prior to laser operations, backstops and other non-reflective impervious materials would be inspected for integrity and would be replaced as needed.

As is the case for other test events, operational security precautions could periodically result in the closure of roads and/or beaches, as determined on a case-by-case basis for each event. Risk mitigation measures would be known before a test event is scheduled, and notice would be provided, as appropriate, if areas are to be closed.

Therefore, implementation of the Proposed Action would have a negligible impact to public health and safety. Under the No Action Alternative there would be no change to existing conditions. Accordingly, public health and safety is not carried forward for detailed analysis in this EA.

3.1 Air Quality

This discussion of air quality includes criteria pollutants, standards, sources, permitting, and greenhouse gases (GHGs). Air quality in a region 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.

3.1.1 Regulatory Setting

The pollutants defining the regulatory-based air quality for an area, which are known as "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, NO_2, Pb, and particulates are emitted directly into the atmosphere from emissions sources. Ozone, NO_2, and particulates are formed through atmospheric chemical reactions that are influenced by weather, ultraviolet light, and other atmospheric processes. Emissions of NO_2 are estimated as emissions from all nitrogen oxides (NO_x) in air quality analyses to account for the chemical reactions of combustion gases (U.S. Environmental Protection Agency [USEPA]; 2016; California Air Resource Board [CARB], 2020).

The USEPA General Conformity Rule, as established in Section 176(c) of the Clean Air Act, applies to federal actions occurring in nonattainment or maintenance areas when the total direct and indirect emissions of pollutants (or their precursors) exceed specified thresholds for criteria pollutants. The emissions thresholds that trigger requirements for a conformity analysis are called *de minimis* levels. *De minimis* levels (in tons per year [tpy]) vary by pollutant. If a federal action is determined to not exceed the *de minimis* thresholds, no further analysis is required.

3.1.2 Affected Environment

NBVC is in Ventura County, which is within the Metropolitan Los Angeles Air Quality Control Region (40 CFR 81.17) and the CARB South Central Coast Air Basin. The Ventura County Air Pollution Control District is responsible for implementing and enforcing state and federal air quality regulations in Ventura County. Ventura County is "serious" nonattainment for the 2008 eight-hour ozone National Ambient Air Quality Standards (NAAQS) and "serious" nonattainment for the 2015 eight-hour ozone NAAQS (USEPA, 2016; USEPA, 2020a; USEPA, 2020b). Ventura County is classified as unclassified/attainment for all other criteria pollutants NAAQS. In addition, Ventura County is State nonattainment for California Ambient Air Quality Standards for 1-hour ozone and 24-hour and annual arithmetic mean for PM_{10} (CARB, 2016; CARB, 2018a; CARB, 2018b; CARB, 2020).

NBVC maintains three Ventura County Air Pollution Control District Part 70 permits, similar to a Title V air permit. Over 200 emission sources and 22 separate emission categories are regulated in NBVC's three Title V permits (Point Mugu, 00997; Port Hueneme, 01006; and San Nicolas Island, 01207). According to Permit 00997 for Point Mugu, Ventura County Part 70 permit thresholds are 25 tpy for volatile organic compounds (VOC) and NO_x. The permit requires review and possible update for new air emissions sources.

Due to the nonattainment status of these criteria pollutants within Ventura County, the use of *de minimis* thresholds to define the limit at which a formal Conformity Determination under the Clean Air Act General Conformity Rule is required. Although VOCs (also referred to as hydrocarbons (HC) or reactive organic gases) and NO_x (other than nitrogen dioxide) have no established ambient standards, they are important as precursors to ozone formation; therefore, *de minimis* thresholds for ozone are a combination of VOC and NO_x, not ozone directly. The *de minimis* thresholds that apply (40 CFR 93.153(b)(1)) are 50 tpy for VOC and 50 tpy of NO_x. Nonattainment of State requirements is not considered in the analysis; however, ozone is approximated due to federal NAAQS nonattainment requirements. The non-attainment status of Ventura County and the *de minimis* thresholds are factored together in considering the degree of potential effects. Therefore, if the predicted construction and future operational emissions are estimated to be below the *de minimis* levels, they would not require further analysis under NEPA.

3.1.3 Environmental Consequences

Effects on air quality are based on estimated direct and indirect emissions associated with the action alternatives. 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.

A quantitative analysis was conducted for comparison with the applicable *de minimis* threshold levels. The emissions modeled for the Proposed Action include use of construction equipment during the site preparation and construction of the DESIL building and the operation of the building and laser testing to include vehicles used by technicians and small portable generators used at the target sites as presented in Chapter 2. Emissions were calculated using the California Air Pollution Officers California Emissions Model 2016.3.2. See Appendix B for model inputs and results.

The potential effects of proposed GHG emissions are by nature global. Thus, potential cumulative impacts as individual sources of GHG emissions are not large enough to have an appreciable effect on climate change.

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 would occur with implementation of the No Action Alternative.

3.1.3.2 Alternative 1

Alternative 1 would result in emissions of air pollutants during both construction (from the use of off-road construction equipment and workers traveling to and from the site), and during operations to a limited extent (from the energy consumption of the building for lighting and space heating, water consumption, and commute of 8 to 10 personnel during testing operations). Although smoke or vapors may be emitted during testing, the amount is anticipated to be negligible and these potential emissions have therefore not been estimated.

Criteria pollutant emissions would occur from both project construction and operation of Alternative 1. Construction emissions would include those associated with off-road and on-road construction equipment and worker vehicles. Construction is assumed to begin in 2021 and while the bulk of construction activity is anticipated to occur over approximately a 2 to 3-month period at the L Avenue LATS, for air modeling purposes a maximum of 10 months of construction was assumed. Table 3.1-1 shows the estimated construction emissions of criteria pollutants generated under Alternative 1 compared to the *de minimis* thresholds. Emissions calculation spreadsheets are included in Appendix B.

Table 3.1-1 Estimated Construction Emissions (tons per year) and Comparison to *de minimis* Thresholds

	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
2021 Construction Emissions	0.43	0.05	0.40	0.0006	0.03	0.02
General Conformity *de minimis* Threshold	50*	50*	N/A	N/A	N/A**	N/A
Exceed de minimis?	No	No	N/A	N/A	N/A	N/A

Tpy = Tons per Year
*Threshold for area in serious nonattainment.
**General Conformity *de minimis* thresholds are only provided for non-attainment of Federal Standards.

Table 3.1-2 presents the estimated operational emissions of criteria pollutants from Alternative 1. These emissions capture default area, energy, mobile source emissions, and laser operations based on the maximum number of annual anticipated test events (up to 116 days per year). Emissions calculation model results are included in Appendix B.

Table 3.1-2 Estimated Operational Emissions (tons per year) and Comparison to *de minimis* Thresholds

Source	*NO_x (tpy)*	*VOC (tpy)*	*CO (tpy)*	*SO_2 (tpy)*	*PM_{10} (tpy)*	*$PM_{2.5}$ (tpy)*
Annual Operational Emissions	0.66	0.09	0.56	0.0001	0.03	0.02
General Conformity *de minimis* Threshold	50*	50*	N/A	N/A	N/A**	N/A
Exceed de minimis?	No	No	N/A	N/A	N/A	N/A

Tpy = Tons per Year
*Threshold for area in serious nonattainment.
** General Conformity *de minimis* thresholds are only provided for non-attainment of Federal Standards.

Construction and operations would comply with applicable Ventura County Air Pollution Control District permitting and CARB Portable Equipment Registration Program compliance requirements, as necessary for mobile generators used for operations. Due to the negligible emissions, the Proposed Action would not result in a cumulative impact when considered amongst other projects.

As shown in Tables 3.1-1 and 3.1-2, construction and operational emissions generated by Alternative 1 would be well below the General Conformity *de minimis* thresholds. A Record of Non-Applicability (RONA) has been prepared and is included in Appendix B. Therefore, implementation of Alternative 1 would not result in significant impacts to air quality.

3.1.3.3 Alternative 2

The emissions associated with Alternative 2 would be less than those estimated for Alternative 1. Because Alternative 1 would not exceed criteria pollutant emission *de minimis* thresholds, Alternative 2 would also not exceed the *de minimis* thresholds. Construction and operations would comply with applicable Ventura County Air Pollution Control District permitting and CARB Portable Equipment Registration Program compliance requirements, as necessary for mobile generators used for operations. Therefore, implementation of Alternative 2 would not result in significant impacts to air quality.

3.2 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 divided into two categories: (1) terrestrial vegetation and (2) terrestrial wildlife. Threatened, endangered, and other special status species are discussed in their respective categories. Terrestrial wildlife in this section focuses on species with the greatest potential to be impacted by the Proposed Action.

Because the lasers would be directed from the DESIL at a height of approximately 66 feet above ground level to targets at no less than 4 feet above ground, wildlife would have to be flying in order to be directly exposed to lasers. A total of seven species of bat are known to occur on NBVC Point Mugu, a federal facility. None of these bats are federally or state listed species.

3.2.1 Regulatory Setting

For the purposes of this EA, special-status species are those that are federally listed as threatened or endangered under the Federal ESA, and those species afforded federal protection under the Migratory Bird Treaty Act (MBTA).

The purpose of the ESA is to conserve the ecosystems upon which threatened and endangered species depend, and to conserve and recover listed species. Section 7 of the ESA requires action proponents to consult with the USFWS or National Oceanic and Atmospheric Administration Fisheries to ensure that their actions are not likely to jeopardize the continued existence of federally listed threatened and endangered species, or result in the destruction or adverse modification of designated critical habitat.

Critical habitat cannot be designated on any areas owned, controlled, or designated for use by the DoD where an INRMP has been developed that, as determined by the Department of Interior (DOI) or Department of Commerce Secretary, provides a benefit to the species subject to critical habitat designation. The Navy has adopted an INRMP for NBVC Point Mugu. The INRMP provides conservation objectives and strategies to ensure natural resources are managed in support of the mission and regulatory compliance (Navy, 2019b). Consequently, there is no critical habitat designated on NBVC Point Mugu.

Conservation of migratory birds 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.

Military readiness activities are defined as “training and operations of the Armed Forces that relate to combat, and the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use.” This does not include the routine operation of installation operating support functions; operation of industrial activities; or construction or demolition of facilities listed above (50 CFR 21.3).

There have been recent changes to DOI legal opinions and policy that clarify that the MBTA prohibitions on take apply only to deliberate acts intended to take migratory birds and do not include incidental take (DOI, 2017; USFWS, 2018). DoD policy clarifies that DoD should continue following existing DoD practices designed to minimize – to the extent practicable and without diminishing the effectiveness of military readiness activities – the incidental take of migratory birds (DoD, 2018).

In February 2020, USFWS proposed to revise the MBTA regulations to be consistent with the DOI legal opinion (also referred to as M-37050), which concludes that the MBTA’s prohibitions on take, apply only to actions directed at migratory birds (USFWS, 2020). While construction under the Proposed Action may not meet the definition of military readiness activities that are exempt from the MBTA (whereas laser operations do), construction does not involve deliberate acts intended to take migratory birds. In addition, construction will be limited to non-breeding seasons of migratory birds. The Navy will continue practices designed to minimize the incidental take of migratory birds as part of the Proposed Action. As such, MBTA compliance is not analyzed further in this EA.

Bald and golden eagles are protected by the Bald and Golden Eagle Protection Act (16 United States Code [U.S.C.] 688). The Act prohibits anyone, without a permit issued by the Secretary of the Interior, from taking bald eagles, including their parts, nests, or eggs. The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb."

Because the Proposed Action has the potential to affect federally listed species, the Navy initiated ESA Section 7 formal consultation with the USFWS by submitting a Biological Assessment on 8 October 2020.

3.2.2 Affected Environment

The action area is defined in the ESA as all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action (50 CFR 402.02). The action area for biological resources is comprised of a 500-foot (152-meter) wide area around the construction site of the proposed L Avenue LATS and a 164-foot (50-meter) area around the trajectory of lasers that would be tested from the DESIL to the land-based laser target sites. See Appendix C (Figures C.1-a and C.1-b) for depictions of the action area.

The configuration of the action area is based on the following potential stressors:

- Habitat removal, noise and visual disturbances from construction related activities at the L Avenue LATS based on known occupancy of federally listed birds within 500 feet of the construction area;
- Potential for federally listed birds near the path of the laser to fly into a laser beam at the precise moment a laser is fired; and
- Potential for federally listed birds near the path of the laser to be disturbed by laser testing, thus potentially disrupting incubation and nest attendance behavior.

3.2.2.1 Terrestrial Vegetation

The action area consists of the following vegetation types:

- Warm Semi-Desert/Mediterranean Alkali-Saline Wetland macrogroup,
- Vancouverian Coastal Dune and Bluff macrogroup, and
- Disturbed and Developed areas.

For a complete list of plant species known to occur on NBVC Point Mugu refer to the 2019 NBVC Point Mugu INRMP, Appendix G (Navy, 2019b). The 2019 NBVC Point Mugu INRMP presents the distribution of terrestrial vegetation at NBVC Point Mugu. The following sections describe these vegetation types (INRMP Figure 3-9).

Vegetation Types

Warm Semi-Desert/Mediterranean Alkali-Saline Wetland Macrogroup

Vegetation types within seasonally tidal and non-tidal salt marsh at NBVC Point Mugu are classified by National Vegetation Classification System as "Warm Semi-Desert/Mediterranean Alkali-Saline Wetland Macrogroup" (HDR, 2013). Vegetation includes alkali heath, Parish's glasswort (*Arthrocnemum subterminale*), saltgrass (*Distichlis spicata*), shoregrass (*Monanthochloe littoralis*), and at the higher margins and in transitional areas, saltbush (*Atriplex lentiformis*). Weeds such as mustards (*Brassica* spp.)

and non-native invasive grasses (*Bromus* spp. and *Avena* spp.) are known to occur in non-tidal marsh areas at NBVC Point Mugu. Non-tidal salt marsh at NBVC Point Mugu provides habitat for resident and migratory birds. Large shorebirds may feed and rest in non-tidal salt marsh, although smaller shorebirds are usually absent or rare. Insects appear to be abundant, but little is known about the benthic invertebrates in this habitat (Navy, 2019b). The federally endangered light-footed Ridgway's rail (*Rallus obsoletus levipes* [LFRR]), is found within this saltmarsh tidal habitat.

Vancouverian Coastal Dune and Bluff Association

At NBVC Point Mugu, the backdunes are a transition zone composed of a variety of vegetation communities and a mix of two macrogroups: Vancouverian-Coastal Dune and Bluff, and in areas of coreopsis (*Coreopsis gigantea*), Viscaino-Baja. Within the Vancouverian-Coastal Dune and Bluff macrogroup is the "California Coastal Evergreen Bluff and Dune Scrub" group, which includes the coyote brush (*Baccharis pilularis*) alliance, and the "Vancouverian/Pacific Dune Mat" group, which contains the dune mat (*Abronia latifolia-Ambrosia chamissonis*) microgroup (HDR, 2013).

Sandy beach habitat provides resting and foraging areas for several shorebirds. Among the birds that occur on the sandy beach at NBVC Point Mugu are the California gull (*Larus californicus*), Heerman's gull (*Larus heermanni*), ring-billed gull (*Larus delawarensis*), western gull (*Larus occidentalis*), willet (*Catoptrophorus semipalmatus*), sanderling (*Calidris alba*), and California brown pelican (*Pelecanus occidentalis*). The beach provides foraging and nesting habitat for the federally threatened Western snowy plover (*Charadrius nivosus nivosus* [WSPL]), and nesting habitat for the federally endangered California least tern (*Sterna antillarum ssp. browni* [CLTE]) (Navy, 2020b). The location of the proposed L Avenue LATS and laser operations are within or adjacent to habitat regularly used by LFRR, WSPL, and CLTE for breeding and non-breeding activities.

Disturbed and Developed

The Disturbed and Developed category consists of areas where vegetation has been heavily disturbed or eliminated from activities such as vehicular use (e.g., road shoulders), hardscape (roads, parking lots, sidewalks), and buildings.

Wetlands

NBVC Point Mugu contains the following major drainages: Calleguas Creek, Revolon Slough, Mugu Lagoon, and adjacent wetlands. The proposed L Avenue LATS is slightly elevated from South L Avenue and Beach Road and adjacent saltmarsh wetlands. Based on a review of existing data and observations during a field visit conducted by biologists from the NBVC Point Mugu Natural Resources office on 26 June 2020, no wetlands occur within the proposed L Avenue LATS footprint. Wetlands and jurisdictional waters are further discussed in Section 3.4, *Water Resources*.

Federally Listed Special Status Plant Species

One federally and state endangered plant species occurs on NBVC Point Mugu, the salt marsh bird's-beak (*Chloropyron maritimum* subsp. *maritimum*). This species is documented as occurring within the action area but not in the construction footprint at the L Avenue LATS. Salt marsh bird's-beak has never been documented as occurring at L Avenue during annual plant surveys primarily because there is a lack of suitable habitat at the site except for a limited (less than five percent) transition area between the back dune to saltmarsh habitat (NBVC, 2020).

Although salt marsh bird's-beak has never been documented within the construction footprint at the L Avenue LATS, a focused preconstruction survey by qualified biologists would be conducted. Thus, the Navy has determined construction or operations would have no effect on salt marsh bird's-beak. Because the Navy has determined the salt marsh bird's-beak would not be impacted by the Proposed Action, it is not analyzed further in this EA.

3.2.2.2 Terrestrial Wildlife

Wildlife in this subsection focuses on species with the greatest potential to be impacted by the Proposed Action. Because the lasers would be directed from the DESIL at a height of 66 feet above ground level to targets at no less than 4-feet above ground, all marine wildlife and terrestrial wildlife other than flying species (birds and bats) have been eliminated from analysis of laser operations. A negligible impact could occur to common terrestrial species such as the California ground squirrel (*Ostospermophilus beecheyi*) during construction; however, these impacts would be negligible and are not discussed further in this EA.

The potential occurrence of bird species is derived from the 2019 NBVC Point Mugu INRMP (Navy, 2019b), and the NBVC Point Mugu 2019 Listed Species and Biological Opinion Comprehensive Monitoring Report to the USFWS (Navy, 2020b). Additionally, the Navy conducted avian point counts from 4 February 2020 through 30 July 2020 (Navy, 2020c). The purpose of the avian point count surveys was to collect data including bird proximity to the proposed path of the laser, population density, and approximate flying height.

The avian point count stations consisted of seven 100-meter diameter circles located along Holiday Beach. Notably, Station 1 surrounds the proposed L Avenue LATS building footprint, a permanent site for land-based laser target operations; Station 4 surrounds the existing Nike Zeus Pad where mobile land-based laser operations are proposed; and Station 6 surrounds the existing Alpha Pad where mobile land-based laser operations are also proposed (see Figure 3.2-1; Navy, 2020c).

Bird species observed during the avian point count surveys between the DESIL and L Avenue LATS included bird species presented in Appendix C. A complete list of listed species including California species of special concern and birds listed on USFWS birds of conservation concern that have been documented on NBVC Point Mugu are presented in Appendix G of the 2019 INRMP (Navy, 2019b).

Figure 3.2-1 2020 Avian Point Count Stations at Holiday Beach

Non-Federally Listed Special Status Species

Non-federally listed special status wildlife species include those that are listed as endangered, threatened or rare under the California ESA, or are a California Species of Special Concern, and California Fully Protected Species.

Belding's Savannah Sparrow

Belding's Savannah Sparrow (*Passerculus sandwichensis beldingi* [BSSP]) is a state-listed endangered species. BSSP resides year-round in the coastal salt marshes of southern California and is common throughout Mugu Lagoon, primarily in the pickleweed-dominated areas of the salt marsh. The Point Mugu subpopulation is the single largest subpopulation, comprising 31 percent of the state total in 2010 (Zembal and Hoffman, 2010).

The Alpha Pad and Nike Zeus Pad are located across the road from and approximately 200 feet (61 meters) south of BSSP habitat. Current activities at these locations include: use as DE sites, small arms firing (including Close-in Weapon System testing and training), missile launches, laser target sites from the ocean surface, and placement of vans during offshore flare testing and training.

Bats

A total of 11 bat species have been documented on NBVC Point Mugu including the following three California Department of Fish and Wildlife listed species of special concern: Pallid bat (*Antrozous pallidus*), Western red bat, *(Lasiurus blossevillii*), and pocketed free-tailed bat (*Nyctinomops femorosaccus*), and the following two California state species of special concern and federal species of concern: Western mastiff bat (*Eumops perotis*), big free-tailed bat (*Nyctinomops macrotis*).

There is a potential for an additional four species of bats to occur at NBVC Point Mugu including the following two California Department of Fish and Wildlife listed species of special concern: Spotted bat (*Euderma maculatum*) and Townsend's big-eared bat (*Corynorhinus townsendii*). The Mexican free-tailed bat (*Tadarida brasiliensis*) which is not listed as a state or federal sensitive species is the most common species at NBVC. Refer to Appendix C, Table C-3.

For a list of all Non-Federally Listed Special Status Species known to occur on NBVC Point Mugu, refer to Appendix G in the 2019 INRMP (Navy, 2019b).

Federally Listed Special Status Species

This section focuses on the three federally listed bird species known to occur in the action area: LFRR, WSPL, and CLTE. As discussed in Section 2.3.2.2, *Proposed Operations,* lasers would be directed from the DESIL roof platform (approximately 66 feet above grade) or from a trailer mount (approximately 27 to 35 feet above grade) to land-based laser targets at no less than 4 feet above grade. As such, all marine wildlife and terrestrial wildlife other than flying species have not been included in the analysis of the proposed operation of land-based laser systems.

Although the federally endangered Least bell's vireo (*Vireo bellii pusillus*) and tidewater goby (*Eucyclogobius newberryi*), occur on NBVC Point Mugu, they do not occur in the action area because it does not contain suitable habitat. For example, historic occurrences are two miles from the action area for Least bell's vireo according to the 2019 INRMP. Therefore, no impact to these species is anticipated, and these species are not discussed further in this EA.

Light-Footed Ridgway's Rail

The LFRR, previously known as the light-footed clapper rail, was federally listed as endangered on 13 October 1970. Critical habitat for LFRR has never been designated. LFRR are found in salt marshes dominated by tall, dense vegetation, typically cordgrass (*Spartina foliosa*), which it uses for nesting and cover, and pickleweed (*Salicornia pacifica*), which it uses for foraging and high tide refuge. Due to its secretive nature, the LFRR is rarely observed (Navy, 2020b) so observations might not be indicative of the true population.

LFRR is a year-round resident bird at NBVC Point Mugu. LFRR commence breeding activity around mid-February with the establishment of mating pairs. Nesting occurs from mid-March to July with most eggs laid between April and May. Dispersal of the young occurs in mid to late-July. Pairs of LFRR can double clutch (California Department of Fish and Game, 2012).

Mugu Lagoon is the northernmost marsh in California occupied by LFRR and represents over 25 percent of the potential habitat for the species (USFWS, 2009). At Mugu Lagoon, nesting occurs in stands of southwestern spiny rush (*Juncus acutus* spp. *leopoldii*) that allow for close proximity to foraging habitat in tidal flats and channels. Between 2000 and 2019, the highest number of pairs detected at Mugu Lagoon was 23 pairs in 2013, while the lowest was 5 pairs in 2008. In 2019, nine pairs were detected during annual LFRR breeding surveys (Navy, 2020b).

Mugu Lagoon represents a relatively secure breeding and foraging site because public access is restricted and because of current NBVC Environmental Division management policies. Also, LFRR are generally tolerant of human activity if it does not result in habitat degradation (USFWS, 2001). Under the NBVC Point Mugu INRMP, LFRR nesting and foraging areas are protected, and additional recovery programs, such as population and nesting monitoring and predator management, are conducted.

LFRR have been observed within 500 feet (152 meters) of the proposed L Avenue LATS, and a LFRR territory is located just north and east of the L Avenue site. Alpha Pad and Nike Zeus Pad are located across the road from and approximately 200 feet (61 meters) south of LFRR habitat as presented in Appendix C, Figure C.2-a. During the 2020 avian point count surveys, three LFRR were detected visually or audibly; one in point count Station 1 north of the proposed L Avenue LATS and two in point count Station 2 east of the proposed L Avenue LATS. LFRR are considered cursorial (ground dwelling) and are rarely observed in flight.

A map showing the 2019 distribution of LFRR at NBVC Point Mugu is presented in Appendix C, Figure C.2-a. For more details on the status of LFRR, refer to the NBVC Point Mugu 2019 Listed Species and Biological Opinion Comprehensive Monitoring Report to the USFWS (Navy, 2020b).

Western Snowy Plover

The Pacific Coast population of the WSPL was federally listed as threatened on 5 March 1993 (USFWS, 1993), and critical habitat was designated on 29 September 2005 (USFWS, 2005). In its current designation of critical habitat (USFWS, 2012), the USFWS has determined that lands subject to the INRMP for NBVC Point Mugu are exempt from critical habitat designation under ESA Section 4(a)(3) owing to the effectiveness of Navy conservation measures implemented.

Although WSPL migrate, they are found year-round at Point Mugu (Navy, 2019b). They forage on open flats and beaches above and below the mean high tide water line and in salt pannes where they eat

insects and marine invertebrates from sand surfaces, decomposing kelp, marine mammal carcasses, and foredune vegetation.

WSPL nest on sandy beaches and above-tidal flats adjacent to Mugu Lagoon from early March to mid-September (Navy, 2002). At NBVC Point Mugu, WSPL chicks are fully fledged by mid-September with the last of the season's nests hatching usually by late July to early August (Navy, 2019b). Most of the sandy beaches and salt pannes including Holiday Beach and Holiday Salt Panne in and near the action area are utilized for foraging, nesting, and resting by WSPL. These areas are considered essential WSPL habitat (Navy, 2002; USFWS, 2014). All open upper beach and hummock habitat at NBVC Point Mugu is suitable for nesting by the WSPL. Most beaches at NBVC Point Mugu are closed to recreation due to military operations. WSPL can be associated with the CLTE, which nest in colonies.

Primary nesting sites used by WSPL on Point Mugu are the western and eastern arms of the Mugu Lagoon barrier beach. They are also found nesting on salt pannes and selected developed sites such as the airfield, launch pads, and recently the closed stretch of L Avenue. Wintering WSPL regularly roost on the stretch of beach in front of the Bravo and Charlie Pads as well as on Family Beach (NBVC, 2012).

Alpha Pad and Nike Zeus Pad are located on previously developed and disturbed land that is within or adjacent to WSPL nesting habitat. During the 2020 avian point count survey, 57 WSPL were documented between 4 February and 30 July 2020. Most were observed within the avian point count Station 1 near the L Avenue LATS and point count Station 4 near Nike Zeus Pad. WSPL detected during surveys were mostly observed on the ground or making short and low movement flights.

A map showing the 2019 distribution of WSPL at NBVC Point Mugu is presented in Appendix C, Figure C.2-b. For more details on the status of WSPL, refer to the NBVC Point Mugu 2019 Listed Species and Biological Opinion Comprehensive Monitoring Report to the USFWS (Navy, 2020b).

California Least Tern

The CLTE was federally listed as endangered on 2 June 1970 but critical habitat has not been designated. CLTE establish nesting colonies on sandy soils with little vegetation along the ocean, lagoons, and bays. CLTE nest in open beach habitat adjacent to Mugu Lagoon. They forage in the shallow open waters of the lagoon and ocean waters just offshore. CLTE nests are shallow depressions lined with shells or other debris.

CLTE are migratory birds and generally present at nesting areas in California between April and mid-September often with two waves of nesting during this period (California Department of Fish and Game, 2012). Most CLTE arrive in late May and depart NBVC Point Mugu by late July to early August with usually only a few individuals observed into mid-August (Navy, 2020b).

CLTE also nest on open sandy beaches. Estuaries and inland lakes are preferred areas for foraging terns, especially fledglings. At NBVC Point Mugu, most CLTE occupy habitat on the western portion of the installation with most of the nesting population at Ormond East Beach and Holiday Beach. CLTE occasionally nest in the eastern arm, but nesting is occasional as reproductive success is low on that site. Both CLTE and WSPL seem to prefer some amount of dune vegetation nearby, as well as debris (e.g., driftwood) on the sandy beach. Eggs and chicks of both these birds are vulnerable to a variety of predators as well as to human disturbance (Navy, 2020b).

Mugu Lagoon and the adjacent beaches and marshes represent a relatively secure breeding and foraging area for the species due to no public access and current NBVC Environmental Division management policies. The first documented CLTE nesting attempt on Holiday Beach occurred in 2003. Prior to 2003, most CLTE nests were found on the Ormond East colony. An average of 106 nests have occurred on Holiday Beach from 2005 to 2019, with a high of 278 nests in 2015 to a low of 31 nests in 2011. Two to 34 nests have been found on the Holiday Salt Panne. Over the last five years, on average 46 percent of CLTE nests on NBVC have been on Holiday Beach and Holiday Salt Panne. CLTE nesting and foraging areas are protected and additional recovery programs, such as population and nesting monitoring and predator management, are conducted.

The Nike Zeus Pad is located on previously developed and disturbed habitats that are adjacent to CLTE breeding areas with most breeding occurring to the west of Nike Zeus Pad. Adjacent open water areas within Mugu estuary are at times utilized for foraging by CLTE. A map showing the 2019 distribution of CLTE at NBVC Point Mugu is presented in Appendix C, Figure C.2-c. For more details on the status of CLTE, refer to the NBVC Point Mugu 2019 Listed Species and Biological Opinion Comprehensive Monitoring Report to the USFWS (Navy, 2020b).

Between 1 May 2020, (the first 2020 point count survey observation of a CLTE) and 30 July 2020, there were 1,106 CLTE observed in the point count stations. Most of the terns were observed flying along the coastline and not crossing the laser path (east to west lines from DESIL to the L Avenue LATS bisecting the avian point count stations). The survey results showed that the heaviest concentrations of terns were observed flying within point count Stations 1, 2, and 3 between the L Avenue LATS and the Nike Zeus Pad. For more details on the most recent status of the CLTE refer to NBVC Point Mugu 2019 Listed Species and Biological Opinion Comprehensive Monitoring Report to the USFWS (Navy, 2020b).

Appendix C (Table C-2) presents the historic totals of CLTE at NBVC Point Mugu. In 2020, the number of nests were historically low with many of the nests lost to high tides or predation (i.e., coyotes and ravens) (NBVC, 2020).

3.2.3 Environmental Consequences

This analysis focuses on vegetation or wildlife types within the action area that are important to the function of the ecosystem or are protected under federal law or statute. The Navy would continue to manage habitats according to the INRMP, which contains conservation objectives and strategies to ensure natural resources are managed in support of the mission and regulatory compliance. This will benefit federally protected species, non-listed migratory birds and species protected by state regulations.

The analysis is divided into two phases of the Proposed Action: 1) Construction of the L Avenue LATS building, and 2) Laser operations from the DESIL to each of the land-based laser target sites.

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 existing conditions. Therefore, no significant impacts to biological resources would occur with implementation of the No Action Alternative.

3.2.3.2 Alternative 1

Construction

Terrestrial Vegetation

Construction would occur only at the L Avenue site. Additional localized disturbance would occur for utility trenching and drop arm installation (in previously disturbed road shoulders). Construction would result in the permanent removal of 0.11 acre (0.05 ha) of Vancouverian Coastal Dune and Bluff habitat. Another 0.60 acre (0.02 ha) would be temporarily impacted from vehicles, laydown, and other construction related activities. The L Avenue site is located across the street from sandy dune habitat regularly used by the WSPL and CLTE. The L Avenue site is also located adjacent to saltmarsh habitat for the LFRR. (See Table 3.2-2 and Figure 3.2-2). No grading, construction, or vegetation removal is proposed at the Alpha or Nike Zeus Pads.

Table 3.2-2 Temporary and Permanent Impacts to Plant Communities Occurring in the Project Footprint

Plant Community Alliance	*Temporary Impacts in LATS Footprint (acres [ha])*	*Permanent Impacts in LATS Footprint (acres [ha])*	*Total Impacts (acres [ha])*
Vancouverian Coastal Dune and Bluff Association	0.60 (0.02)	0.11 (0.05)	0.71 (0.07)
Disturbed/Developed	0.05 (0.02)	0.02 (0.01)	0.07 (0.03)
TOTAL	0.65 (0.04)	0.13 (0.06)	0.78 (0.10)

Terrestrial Wildlife

A large portion of the proposed construction footprint is located within previously disturbed habitat. Indirect impacts associated with fragmentation of habitat are expected to be minimal, as the project area is adjacent to high-value habitat areas and the resulting flat surface would not present a major barrier to dispersal or movement of wildlife.

Direct impacts to wildlife associated with construction activities under Alternative 1 would include temporary and permanent displacement of individual wildlife species from land that provides wildlife habitat. Individuals of smaller, less mobile species and those seeking refuge in burrows (e.g., invertebrates and reptiles) could inadvertently be impacted during construction activities; however, long-term, permanent impacts to populations of such species would not result because these species are abundant in surrounding areas.

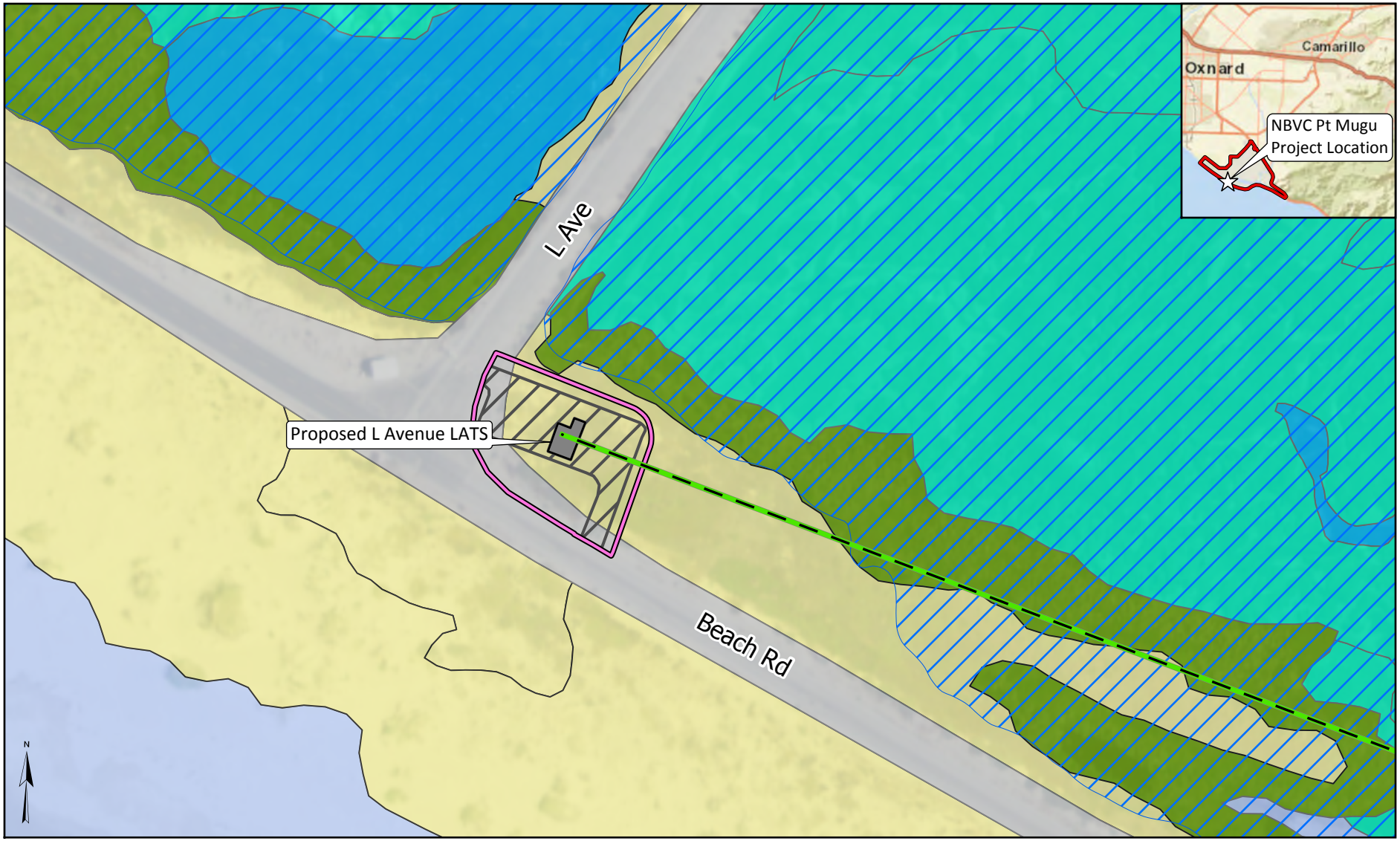

Figure 3.2-2 Temporary and Permanent Impacts to Plant Communities Occurring in the Project Footprint

Non-Federally listed Special Status Species

Belding's Savannah Sparrow

Although BSSP habitat is located near the proposed action area (200 feet [61 meters] north of Alpha Pad and Nike Zeus Pad), construction of the L Avenue LATS would occur outside of the BSSP nesting season. Preconstruction bird nesting surveys would be required prior to earth moving activities. The Navy does not anticipate any impacts to nesting BSSP from construction related activities. Non-nesting BSSP that may be foraging in the saltmarsh near the L Avenue LATS would likely avoid the area or flush due to construction noise. Therefore, the Navy does not anticipate any impacts to nesting BSSP from construction related activities. These indirect impacts would be short-term, intermittent, and less than significant.

Bat Species

Pallid bat, Western red bat, Western mastiff bat, pocketed free-tailed bat, and big free-tailed bat, are not known to breed or roost within the proposed construction area therefore construction activities are unlikely to disturb bat breeding activities. Construction activities would be limited to daytime hours; therefore, construction is not anticipated to disrupt the foraging activities of these nocturnal species. Any potential indirect impacts would be short-term, intermittent and less than significant.

Federally listed Special Status Species

Light-Footed Ridgway's Rail

During construction of the L Avenue site, there is a potential for temporary, indirect effects to the LFRR from construction noise, vibration (from use of heavy equipment), and visual disturbances (e.g., increased presence of personnel), which may displace non-breeding LFRR in the immediate area.

Noise associated with heavy equipment (e.g., backhoes, bulldozers, etc.) is anticipated to range from 74 to 90 decibels at 50 feet. The predominant noise at NBVC Point Mugu is generated from airfield and surface launch operations. The action area is located less than one mile from the NBVC Point Mugu airfield and within the AICUZ noise contours (75 decibels and 80 decibels) (NAVFAC SW, 2015).

Although construction noise would result in a slight increase of existing noise levels (outside of noise associated with aircraft), there is a potential for effects to LFRR in the immediate vicinity. However, the density of LFRR is low. There is likely no more than one pair of LFRR within 500 feet of the construction footprint (Navy, 2020c). Non-breeding LFRR that are close to the site may move further away from the site during loud activity. There is a substantial amount of available foraging habitat in the marsh within the vicinity of the L Avenue site outside of the area of potential effect; therefore, temporary inaccessibility to foraging opportunities adjacent to the construction site would not result in an adverse effect (NBVC, 2020). LFRR are generally tolerant of human activity, as LFRR commonly nest along the roadside and near the airfield at NBVC Point Mugu (USFWS, 2016).

Construction of the L Avenue LATS would be scheduled to avoid the LFRR breeding season, which is 1 March to 1 September. Prior to construction of the L Avenue LATS, adjacent wetlands would be flagged for avoidance. Therefore, the Navy concludes, with implementation of proposed conservation measures, construction of the L Avenue LATS would not result in a significant impact on LFRR. The Navy also concludes, with implementation of proposed conservation measures, construction of the L Avenue LATS may affect but is not likely to adversely affect the LFRR.

Western Snowy Plover

Non-breeding WSPL are not in close enough proximity to the project site (no closer than 400 feet to the nearest plover foraging habitat) to be potentially impacted by construction related activities. The slope of the beach along the wrack line where WSPL forage is lower in elevation than the L Avenue site. The presence of large dunes south of Beach Road would further help to attenuate construction noise. Ambient noise from the surf and aircraft (ranging from 75 to 80 decibels) would further mask construction noise. WSPL tolerance and adaptability (especially during non-nesting season) to human activities would remove any potential disturbance from project construction. All construction would occur outside WSPL nesting season.

Therefore, the Navy concludes, with implementation of proposed conservation measures, construction of the L Avenue LATS would have no impact on the WSPL. Additionally, in accordance with the ESA, the Navy also concludes, with implementation of proposed conservation measures, construction of the L Avenue LATS would have no effect on the WSPL.

California Least Tern

A temporary increase of construction related noise and vibration from heavy equipment would occur during construction of the L Avenue LATS. Construction would occur outside of the nesting season, there would be no impacts from construction related activities, as CLTE are not present outside of the nesting season. Most CLTE arrive in late May and depart NBVC Point Mugu by late July to early August, with usually only a few individuals observed into mid-August (Navy, 2020b).

Therefore, the Navy concludes, with implementation of proposed conservation measures, construction of the L Avenue LATS would have no impact on the CLTE or other migratory birds. The Navy also concludes, with implementation of proposed conservation measures, construction of the L Avenue LATS would have no effect on the CLTE.

Operations

The following section analyzes the effects of proposed laser operation on terrestrial wildlife, focusing on ESA listed birds: the LFRR, the WSPL, and the CLTE.

To better understand the risk of birds being exposed to lasers and the following analysis, it may be helpful to the reader to first learn more about the proposed operating laser geometry and operational tempo. To do this, refer to Appendix D, Laser Geometry and Operating Tempo.

Terrestrial Vegetation

The Navy would continue to manage habitats according to the INRMP, which is designed to protect and benefit threatened and endangered species. The INRMP contains conservation objectives and strategies to ensure natural resources are managed in support of the mission and regulatory compliance. Therefore, implementation of Alternative 1 would not result in significant impacts to biological resources.

Terrestrial Wildlife

Avian Point Count Surveys

To help inform the potential exposure of ESA listed birds from laser operations, the Navy conducted avian point counts that began on 4 February 2020 and continued through 30 July 2020 (Navy, 2020c).

These surveys identified locations where the highest population densities of migratory birds, with a focus on federally listed birds were located relative to proposed laser operations and estimated flying height, which are metrics necessary for understanding exposure risk. Of the three listed species considered for analysis, CLTE had the highest risk of being exposed to a laser during the CLTE nesting season. This is due to their larger population numbers in the immediate area and various flight behaviors (flight elevation, foraging trips, and reactions to predators [i.e., predator mobbing]). No non-listed migratory birds were frequently observed crossing the laser path at the potential laser height to be considered as a significant impact to that species (Appendix D).

During the avian point count surveys, the approximate height of flying birds was estimated: CLTE average height was over 35 feet and WSPL height was less than 2 feet; however, it was difficult for the observer to determine if flying birds were in the precise vertical and horizontal position required to actually cross through a laser path. For example, the typical HEL diameter is less than 8 inches sloping from an approximate height of 66 feet from the DESIL to no less than 4 or 5 feet above the ground at the L Avenue LATS and each mobile land-based laser target site. Nearly half of the CLTE observed during the 2020 avian point count surveys were recorded flying in an east/west pattern along the coast, at least 300 feet away and flying parallel to the laser path but not crossing it. The other half of the CLTE were observed flying in a northerly or southerly direction may have crossed the projected path of the laser.

Potential Direct and Indirect Impacts

It is important to state that the potential impacts of lasers on wildlife is necessarily speculative as there is currently little to no empirical data associated with the impacts of momentary exposure of lasers on birds and bats or how birds and bats may react to visual laser testing as proposed. To make effects determinations, the Navy is relying on peer-reviewed data and data derived from predicted impacts to humans (e.g., [Army, 2020]). The Navy's conclusions are largely inferred from characteristics such as wavelength, energy level, exposure time, etc. Some inferences are also based on input from Naval laser safety experts (e.g., [NSWC, 2020]).

High Energy Lasers. As previously discussed, HELs power up to 1 megawatt (average). In addition, HELS typically use the infrared spectrum of light waves, invisible to birds and bats. HELs typically make little to no noise when tested. For this reason, the testing of HELs at NBVC Point Mugu has limited potential to elicit a change to a bird's behavior (i.e., a flush response). The only potential impact associated with the HELs would be a direct impact to a flying bird or bat crossing the beam during the few seconds (up to 10 seconds) that the beam is active.

The likelihood of a bird or bat flying through an active laser beam is low for several reasons. First, the typical beam width of the HEL is approximately 8 inches (20 centimeters) (beam geometry and volumetric calculation can be found in Appendix D). The HEL would typically be tested for no more than 10 seconds at a time (or 5 minutes in a 24-hour period). This results in a very small hazard area that is only active for very short periods of time.

Second, the Navy would implement several conservation measures that aim to eliminate interactions with listed species. Observers or a camera would be positioned at the target sites and an observer at the DESIL (point of origin). With the use of high-quality optics, the observer at the point of origin would ensure the laser path is clear of wildlife prior to beginning a test event. Should birds or bats be observed

flying in the area of the laser beam path (164 feet on either side of the laser beam centroid) prior to beginning a test, the test would be paused until wildlife are no longer flying within the action area.

When considering the procedural mitigations being proposed of laser operations, specifically the use of observers and delaying tests when there are birds present within the beam path and areas directly adjacent to the beam path, the chance of a bird crossing the exact location of the beam at the exact time it is turned on is extremely low.

The potential impacts of a bird or bat flying through the path of a laser may include physical injury (e.g., skin or plumage damage), eye injury, or mortality. It should be noted that there is no known data on the potential effect of a very brief exposure to HELs and no currently known data related to its immediate or long-term impact on birds. At the very highest power levels, it is possible that even brief interactions with the laser beam may result in mortality. Because wildlife would have to be flying to be exposed to an HEL beam, exposure would be very brief (i.e., less than one second).

Lower Power Lasers. Lower Power Lasers generally include Class 1, 2, 3 lasers. Unlike HELs, Lower Power Lasers are not used to destroy targets. These lasers may be used for targeting or for disrupting adversary surveillance among other uses. Due to the low energy level of these lasers, they are considered skin safe and would not be expected to cause skin injury from direct contact (NSWC, 2020). Mortality from direct exposure to Lower Power Lasers is, therefore, unlikely.

Like HELs, these lasers are largely quiet. Unlike HELs, some Lower Power Lasers use light that is within the visible spectrum. For these reasons, the most likely effects of Lower Power Lasers would be temporary impacts to the eye (flash blindness) and disorientation if birds cross through a laser as well as potential disturbance from the visual cue of the laser itself. Class 1-3R lasers are considered “eye safe” (NSWC, 2020). Therefore, permanent eye damage (i.e., retina damage) is unlikely due to the lower power levels and short duration of any potential exposure. Similarly, the potential for birds to receive temporary flash blindness from the Lower Power Lasers is very limited because the bird would have to be flying to be exposed thereby limiting the exposure time (i.e., one second or less). While the Lower Power Laser beam diameter is larger than the HEL beam (typically 6.6 feet [2 meters]) and the duration of the test is longer (i.e., 10 minutes) for Lower Power Lasers, it is still a relatively small area in a relatively short duration.

It is currently unknown exactly how wildlife would respond to the visual presence of the lasers during the proposed laser operations. There is no specific data on bird reactions to visible lasers as proposed; however, there is some data on bird responses to visible lasers that are used specifically to deter birds. In tests involving a variety of birds, researchers were able to use lasers to cause birds to leave an area. However, in many of these cases birds returned within minutes (e.g., Gorenzel et al., 2010) or quickly habituated and stopped responding to the visual stimulus (e.g., Blackwell et al., 2002). It should be noted that researchers found these results even when lasers were used specifically to startle or harass birds (e.g., pointing lasers directly at groups of roosting birds). For these reasons, while it is possible that some birds or bats may be startled from the visual stimulus associated with these laser systems, it is anticipated that this would only occur to wildlife that is in close proximity to the laser, and these birds may eventually habituate to the laser. Finally, it should be noted that because the Lower Power Laser would be used throughout the year, wildlife that continue to be startled by the laser and fail to

habituate to visible laser operations may choose to forage, nest, or roost elsewhere further lessening the potential long-term impacts of additional laser operations.

Non-Federally listed Special Status Species

Belding's Savannah Sparrow

There is a potential for BSSP to fly through the action area during laser operations. The likelihood of an individual being affected by laser operations is low but not entirely discountable for the following reasons. Due to the low tempo of laser operations (i.e., less than 34 cumulative hours of HEL and Lower Power Laser use within a year), and relatively small hazard area, the likelihood of a BSSP being affected by laser operations is low but is still not discountable. Therefore, the Navy concludes that with implementation of conservation measures, the proposed laser operations would not result in significant impacts to BSSP.

Bat Species

Pallid bat, Western red bat, Western mastiff bat, pocketed free-tailed bat, and big free-tailed bat, and other bat species actively forage between dusk to dawn. As laser testing may occur at night, there is a potential risk for these and other bat species to be exposed to lasers. The likelihood of an individual being affected by laser operations is low but not entirely discountable for the following reasons: (1) the low tempo of laser operations (i.e., less than 34 cumulative hours of HEL and Lower Power Laser use within a year); (2) A small percentage of these tests would occur at night; and (3) There is a relatively small hazard area, further reducing the likelihood of a bat species being affected by laser operations. Therefore, the Navy concludes that with implementation of conservation measures, the proposed laser operations would not result in significant impacts to bat species.

Federally listed Special Status Species

Light-Footed Ridgway's Rail

While LFRRs are year-round residents at NBVC Point Mugu and would be present within the action area throughout the year, the potential for exposure to laser operations is low due to the low abundance at NBVC and behavior of the birds. LFRRs were only observed once and heard twice during the 2020 avian point count surveys. Five of the ten rail territories were documented along Beach Road (near or below the laser path during the 2019 annual surveys [Navy, 2020b]).

In addition to the low abundance of the species at NBVC Point Mugu, behavioral patterns of the LFRR would further reduce potential impacts to the species. LFRRs are generally cursorial (i.e., ground-dwelling) and are rarely observed flying. Rails are considered "secretive" as they typically remain under cover to avoid predation, nest in thick saltmarsh vegetation, and do not easily flush from nests when disturbed. No wild rails have ever been observed flying by NBVC Natural Resources staff in the last 19 years. Captive-bred rails that were being released at Point Mugu from kennels were observed making short low flights upon release (NBVC, 2020).

Summary. Due to the very low abundance of LFRRs within the action area, their ground-dwelling behavior combined with the low tempo of laser operations (i.e., less than 34 cumulative hours of HEL and Lower Power Laser use within a year) and relatively small hazard area, the likelihood of an LFRR being directly impacted by laser operations is so low as to be discountable. As LFRR regularly remain under cover and do not flush readily from nests, disturbance from visible lasers overhead or nearby is

also unlikely. Therefore, the Navy concludes that with implementation of conservation measures, the proposed laser operations would not result in significant impacts to LFRR. The Navy has also determined that laser operations may affect but are not likely to adversely affect LFRR.

Western Snowy Plover

While WSPL are year-round residents at NBVC Point Mugu and would be present within the action area, the potential for exposure to laser operations is low for several reasons. First, WSPL are known to habituate well to nearby activities at NBVC Point Mugu (NBVC, 2020). While there is a potential for WSPL to react to lasers using the visual spectrum of light as WSPL are visually acute (NBVC, 2020), WSPL tend to habituate quickly to a novel disturbance if activity is not in close proximity (within 100 feet) to nests. A temporary cease in incubation (flushing of incubating adults) may occur if startled by the sudden appearance of a visible laser above or near a nesting site.

Based on previous behavior monitoring of WSPL on Point Mugu, it is suspected if WSPL flush due to laser testing they would likely soon return to incubate, and nest loss or abandonment should not occur. WSPL regularly nest on the airfield, roadsides, and operational pads (Bravo and Alpha), so they habituate to regular activity (aircraft, cars, and personnel [NBVC, 2020]). WSPL may cease incubation and leave nests, flushing when personnel or heavy equipment approach nests, but usually return to incubate once the threat becomes stationary. For example, NBVC biologists observed a WSPL leaving their nest at the onset of recovery efforts for a grounded boat within 100 feet of their nest; however, as soon as the WSPL realized the heavy equipment was not moving any closer toward their nest, they returned to incubate (NBVC, 2020).

Personnel and vehicles are common near the proposed L Avenue LATS; therefore, WSPL are anticipated to habituate and not be affected by these activities. Brief breaks in incubation should not result in a reduction in hatching success. Conservation measures would also require cameras to be placed near selected nests during initial operations to observe and confirm expected WSPL reactions to visible laser operations. In addition, the laser path from the DESIL to the Alpha Pad and L Avenue LATS do not cross over WSPL nesting areas. Only a limited stretch of the laser path to the Nike Zeus Pad target site would cross over the outer limits of a WSPL nesting area.

Second, there is limited spatial overlap between the WSPL and laser operations. During the 2020 avian point count surveys, WSPL were mostly observed on the ground in nesting areas with occasional flights at low elevations. The average flying heights of WSPL was less than two feet. WSPL were not observed crossing the laser path to the L Avenue LATS along Beach Road during any of the surveys. WSPL usually remain on beach habitat to nest and forage and have not been observed flying from beach to marsh crossing LATS target pathway (NBVC, 2020). Therefore, when the laser path is closest to plover beach-nesting habitat (near the Nike Zeus target site), the laser beam would be well above (approximately 35 to 50 feet) the height of observed WSPL flight elevations observed during avian surveys conducted at NBVC Point Mugu.

Third, the likelihood of crossing the laser beam path while the laser is energized is low. The testing of lasers would be relatively brief, thereby reducing the WSPL's potential exposure to lasers. The HEL would be tested for no more than 5 minutes over a 24-hour period, typically in 10-second increments. It

is unlikely that a WSPL would fly into the precise vertical and horizontal position within the narrow diameter of an HEL beam at the same precise moment it is being tested (i.e., one second or less).

Due to the wider diameter beam and longer operation time of the Lower Power Lasers such as Dazzlers, the Navy concluded there is increased potential for a WSPL to be exposed as compared to the HEL beam. Because most of the birds are anticipated to fly below the Lower Power Laser beam, it is unlikely any WSPL would be directly exposed to Lower Power Lasers. Any potential exposure to a Lower Power Laser is not likely to result in significant injury but may lead to temporary flash blindness or disorientation. Any potential exposure to a Lower Power Laser would be brief as WSPL is not anticipated to hover within the beam. To further reduce the risk of potential impacts, laser operators would ensure no birds are in or near the trajectory of a laser before a laser is tested. All target sites would be equipped with backstops to prevent lasers from shooting past or through a target.

Summary. Due to the behavior of WSPL at NBVC Point Mugu to habituate well to nearby activities, the limited nests in the action area, the low flight height of the WSPL, the low tempo of laser operations (i.e., less than 34 cumulative hours of HEL and Lower Power Laser use per year) and relatively small hazard area, the potential for adverse impacts to WSPL are very low. With implementation of the proposed conservation measures, the potential for adverse impacts is so low as to be discountable. Therefore, the Navy concludes that with implementation of conservation measures, the proposed laser operations would not result in significant impacts to WSPL. The Navy has also determined that laser operations may affect but are not likely to adversely affect WSPL.

California Least Tern

The likelihood of a CLTE being affected by laser operations is low but not entirely discountable for the following reasons. First, CLTE are migratory birds and would be present within the action area only 4 out of 12 months of the year, thus reducing the potential for exposure to laser testing. Most CLTE arrive in late May and depart NBVC Point Mugu by late July to early August with usually only a few individuals observed into mid-August (Navy, 2020b).

Second, CLTE are anticipated to habituate to the incremental increase of operational activities based on current activities and distance of most tern nests. The distance of most tern nests average 250 feet from the L Avenue LATS based on the last two years of data, but some nests could be as close as 100 feet, based on 2019 and 2020 surveys (NBVC, 2020). Operational activities such as increased personnel and vehicle use at the mobile target sites and proposed L Avenue LATS (e.g., setting up targets, positioning CONEX boxes, etc.) are not anticipated to have an adverse effect on CLTE nesting in adjacent areas, as personnel and vehicles are somewhat common at the proposed target locations. Given the level of continuing Navy activity around Mugu Lagoon, it is expected that the proposed operations would not significantly increase the current levels of noise (75 to 80 decibels) and personnel to a level that would disrupt least tern foraging.

Further, CLTE are also anticipated to habituate to potential flush response from lasers within the visual spectrum. There is a potential for indirect effects to CLTE should they flush from the sudden appearance of Lower Power Laser beams within the visual spectrum of light waves such as TILs and Dazzlers. Although the lasers would not be tested directly over nesting areas regularly used by CLTE, visible laser testing near CLTE nesting areas may elicit a flush response, potentially disrupting the CLTE's incubation

behavior. NBVC Point Mugu biologists observed terns flushing from their nests from the use of flashlights while conducting nocturnal predator management of coyotes near tern colonies on Holiday Beach. Terns returned to their nests within approximately five hours (NBVC, 2020). It is suspected based on prior CLTE behavior observed at NBVC, minimal to no reaction would occur based on the distance (average 250 feet) between the laser path and tern nesting areas (NBVC, 2020). To better understand CLTE reactions to visible lasers, a qualified biologist would observe CLTE reactions to laser operations and would place cameras on selected nests to monitor for disturbance associated with the laser operations.

Third, there is limited spatial overlap between CLTE and laser operations. Although numerous CLTE were observed in the action area during recent surveys, nearly half were documented flying along Holiday Beach in a west/east direction following the shoreline (at a minimum of 300 feet away from the path of the laser) and not crossing the laser pathway. As previously stated, between 1 May 2020 (the first observation of a CLTE during the surveys that began in February) and 30 July 2020, there were a total of 1,106 least tern observations in the point count stations. Of those 1,106 CLTE, 675 were recorded flying in a direction that may have crossed the path of the laser (north [including northeast and northwest] or south [including southeast and southwest]). Although multiple least tern individuals may have been counted more than once, the survey results showed that the heaviest concentrations of terns were observed within point count Stations 1, 2 and 3 between the L Avenue LATS and the Nike Zeus Pad. At Station 1, the laser trajectory would be low, at an elevation below 15 feet asl; therefore, most of the CLTE would likely fly above the laser path, especially near the target sites where the trajectory of the beam is lowest.

Finally, the likelihood of crossing the laser beam path while the laser is energized is low. The testing of lasers would be relatively brief, further reducing the CLTE's potential exposure to lasers. The HEL would be tested for approximately 10 seconds per operation or 5 minutes over a 24-hour period. It is unlikely that a CLTE would fly into the precise vertical and horizontal position within the narrow beam of the HEL at the same precise moment it is being tested.

Due to the wider diameter beam and longer operation time of the Lower Power Lasers such as Dazzlers, the Navy concluded there is increased risk for exposure as compared to the HEL beam. Any potential exposure to a Lower Power Laser would likely be brief, potentially resulting in temporary flash blindness or disorientation with permanent injury less likely. Lower Power Lasers (e.g., Dazzlers) would be active for no more than 30 minutes in a 24-hour period, which would limit the opportunity for any potential exposure. To further reduce the risk of potential impacts, laser operators would ensure no birds are in the trajectory of the laser and surrounding area before a laser is tested and all target sites would be equipped with backstops to prevent lasers from shooting past or through a target.

Although the Navy proposes numerous conservation measures to reduce the potential for direct and indirect effects from laser operations, there is still a small possibility that CLTE could come in to contact with lasers during operations. Any direct exposure would be brief (i.e., less than 1 second) but may have the potential for injury or mortality from an HEL beam, or minor effects such as temporary flash blindness or disorientation from a Lower Power Laser beam.

Summary. Due to the limited (seasonal) presence of CLTE at NBVC Point Mugu, the average distance of nests from the laser pathway (approximately 250 feet), combined with the low tempo of laser operations (i.e., less than 34 cumulative hours of HEL and Lower Power Laser use per year), and relatively small hazard area, the likelihood of a CLTE being affected by laser operations is low but is still not discountable. The Navy determined the proposed laser operations may affect and are likely to adversely affect the CLTE. However, the Navy concluded that with implementation of conservation measures, the proposed laser operations would not result in significant impacts to CLTE.

The Navy would continue to manage habitats according to the INRMP, which is designed to protect and benefit threatened and endangered species. The INRMP contains conservation objectives and strategies to ensure natural resources are managed in support of the mission and regulatory compliance.

On 8 October 2020, the Navy initiated formal consultation per Section 7 of the ESA with the USFWS by submitting a Biological Assessment to the USFWS. In the Biological Assessment, the Navy determined that the Proposed Action falls under a "may affect and is likely to adversely affect" determination for CLTE, and a "may affect but not likely to adversely affect" determination for WSPL and LFRR.

On 16 April 2021, in their Biological Opinion (see Appendix F), the USFWS concurred with the Navy's determination that construction and testing activities under Alternative 1 may affect but is not likely to adversely affect WSPL and LFRR. In addition, the USFWS concluded in their Biological Opinion that Alternative 1 would not jeopardize the continued existence or recovery of CLTE.

In their Biological Opinion, the USFWS issued an Incidental Take Statement which allows for the following:

> *"… during any 2-year period if, as a result of project activities, three (3) breeding adult [CLTE] are injured or killed, four (4) eggs are damaged or abandoned (from one or more nests), or four (4) chicks are abandoned, killed, or injured (from one or more nests), the Navy must contact our office immediately to reinitiate formal consultation. Project activities that are likely to cause additional take should cease as the exemption provided pursuant to section7(o)(2) may lapse and any further take could be a violation of section 4(d) or 9."*

Terms and conditions outlined by the USFWS are as follows:

> *"The Navy must request our approval of any biologist that they or their contractors employ to conduct project activities associated with the [CLTE] pursuant to this biological opinion. Such requests must be in writing and be received by the Ventura Fish and Wildlife Office at least 30 days prior to any such activities being conducted. Please be advised that possession of a 10(a)(1)(A) permit for the [CLTE] does not substitute for the implementation of this measure. Authorization of Service-approved biologists is valid for this project only."*

With the continuation of the Navy's overall stewardship and conservation program for the LFRR, WSPL, and CLTE, and implementation of the identified conservation measures, implementation of Alternative 1 would not result in an appreciable reduction in the numbers, reproduction or distribution of the LFRR, WSPL, or CLTE. Therefore, implementation of Alternative 1 would not result in significant impacts to

biological resources, including federally listed species, non-listed migratory birds and species protected by state regulation.

3.2.3.3 Alternative 2

The only difference between Alternative 1 is that the LATS would not be constructed at L Avenue as proposed under Alternative 1. A similar amount of earthwork and imported fill materials required for the concrete pad under Alternative 1 would occur under Alternative 2. Therefore, construction impacts to biological resources would be less than they would be under Alternative 1. Operationally the only difference from Alternative 1 is the use of mobile targets at the proposed L Avenue site. Since no permanent LATS would be constructed at the L Avenue site, operational activities at the L Avenue would be similar to the same activities proposed at Nike Zeus and Alpha Pads. These activities would include increased personnel and vehicle use needed for setting up targets, positioning CONEX boxes, etc. If implemented, Alternative 2 would be required to follow the same avoidance and minimization measures listed in Appendix E. Therefore, implementation of Alternative 2 would not result in significant impacts to biological resources, including federally listed species, non-listed migratory birds and species protected by state regulation.

3.3 Coastal Resources

This discussion of coastal resources includes Coastal Zone Management and sea level rise.

3.3.1 Regulatory Setting

3.3.1.1 The Coastal Zone Management Act

The Coastal Zone Management Act of 1972 (16 U.S.C. Section 1451–1464) encourages coastal states to be proactive in managing coastal zone uses and resources. The Act established a voluntary coastal planning program in which participating states submit a Coastal Management Plan to the National Oceanic and Atmospheric Administration for approval. Under the Coastal Zone Management Act, federal agency actions within or outside the coastal zone that affect any land or water use or natural resource of the coastal zone shall be carried out in a manner that is consistent to the maximum extent practicable with the enforceable policies of the approved state management programs. Each state defines its coastal zone in accordance with the Coastal Zone Management Act. Excluded from any coastal zone are lands the use of which by law is subject solely to the discretion of the federal government or which is held in trust by the Federal government (16 U.S.C. 1453) (Navy, 2016).

3.3.1.2 California Coastal Commission Policies

The Coastal Zone Management Act defines the coastal zone as extending “to the outer limit of State title and ownership under the Submerged Lands Act.” For the state of California, the seaward extent of the coastal zone is three nautical miles from shore. The state of California has a Coastal Management Plan, which has been approved by the National Oceanic and Atmospheric Administration and is administered by the California Coastal Commission. The California Coastal Act of 1976 (California Public Resources Code, §30000 et seq.) implements California’s Coastal Management Program and outlines federally approved and enforceable policies identifying California’s coastal zone resources.

The California Coastal Act has six enforceable policies on which conservation and development decisions in the coastal zone are based: public access, recreation, marine environment, land resources, development, and industrial development. These policies are intended to protect and expand public access to shorelines for water-oriented activities such as recreation, and to protect, enhance, and restore environmentally sensitive habitats, including intertidal and nearshore waters, wetlands, bays and estuaries, riparian habitat, certain woods and grasslands, streams, lakes, and habitat for rare and endangered plants and animals.

3.3.1.3 Sea Level Rise and Climate Change

While the California coast regularly experiences erosion, flooding, and significant storm events, sea level rise associated with climate change will exacerbate these natural forces, leading to significant social, environmental, and economic impacts. Along the California coast, sea level has risen an average of seven inches (17.8 centimeters) from 1900 to 2005; this rate is predicted to accelerate in coming years (Melillo et al. (aka U.S. Global Change Research Program), 2014). The State of California provides recommended sea level rise ranges for planning analysis, derived from published work by the National Research Council. The State recommends a range of 0.39 to 2.0 feet (0.11 to 0.6 meters) rise for the period from 2000 through 2050, and 1.38 to 5.48 feet (0.42 to 1.67 meters) rise for the period from 2000–2100 (State of California, 2014).

Sea level rise would increase the impact of storms and storm surge on the coastline and could result in an increase in beach erosion and the need for maintenance on coastal roads (e.g., Beach Road) and infrastructure.

3.3.2 Affected Environment

The following discussions provide a description of the existing conditions at NBVC Point Mugu.

3.3.2.1 Coastal Zone Management Act/California Coastal Commission

All of NBVC Point Mugu is within California's designated coastal zone (California Public Resources Code, Division 20); however, the term "coastal zone" does not include "lands the use of which is by law subject solely to the discretion of or which is held in trust by the Federal Government" (16 U.S.C. §1453[1]). NBVC Point Mugu is owned and operated by the Navy and, therefore, excluded from the coastal zone. Because NBVC Point Mugu is excluded from the coastal zone, it is also not subject to the Ventura County Local Coastal Program.

Although NBVC Point Mugu land is Federal government property and excluded from both the coastal zone and Ventura County Local Coastal Program, the Navy conducts effects tests to evaluate potential impacts to coastal resources and uses of the state's coastal zone and submits the evaluation to the California Coastal Commission in a determination document requesting concurrence with the Navy's determination of effects. The effects test supports the Navy's determination that an action would or would not affect any coastal use or resource. Accordingly, the Navy prepared and submitted a Coastal Consistency Negative Determination and consulted with the California Coastal Commission.

3.3.2.2 Sea Level Rise and Climate Change

Along the coastlines of Ventura County, sea levels are rising as a result of three factors – ocean water temperature increases, ice melt, and vertical tectonic land motion. Rising sea levels alone will not be the

primary cause of damage to resources and infrastructure within Ventura County. Damage will be caused by coastal process hazards, particularly coastal erosion and coastal flooding that occur during large wave events, the frequency and magnitude of which will be exacerbated by sea level rise. The sea level along the Ventura County coastline is projected to rise eight inches by 2030, 16 inches by 2060, and 58 inches by 2100 (County of Ventura, 2018).

NBVC Point Mugu conducted a Shoreline Protection Study to assess the short- and long-term vulnerabilities of mission-critical and ecological assets and to develop possible strategies to reduce or eliminate those vulnerabilities (Navy, 2012a). The strategies were formalized into a Shoreline Protection Plan, which outlines specific, pre-design recommendations for stabilizing the NBVC Point Mugu shoreline (Navy, 2012b). The Study concluded certain revetment repairs and enhancements were necessary to protect mission-critical assets located along the shoreline, including particular buildings.

As a result, NBVC Point Mugu is implementing increased protection against sea level rise as part of the Shoreline Protection Repair and Enhancements project (Navy, 2016). For example, Beach Road, parallel to the proposed L Avenue LATS building, has been recontoured north of the L Avenue site. The proposed L Avenue site is protected by a broader beach and more stable dunes. While nearby M Avenue and Building PM-812 were identified as vulnerable areas as part of the Shoreline Protection project, the proposed L Avenue LATS is located 1,914 feet from Building PM-812 and has no history of flooding. In addition, the beach along the L Avenue site is wider (240 feet) compared to the M Avenue site (63 feet) and the L Avenue site has vegetated and more stable dunes compared to the more vulnerable M Avenue area.

In addition, the Navy established a Memorandum of Agreement with The Nature Conservancy in 2016 to implement research of mutual benefit to develop a coastal resilience plan to implement NBVC's INRMP related to climate change and sea level rise at NBVC Point Mugu and Port Hueneme (NRSW, 2016).

3.3.3 Environmental Consequences

The location and extent of a proposed action needs to be evaluated for its potential effects on a project area and coastal resources.

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 existing conditions. Therefore, no significant impacts would occur with implementation of the No Action Alternative.

3.3.3.2 Alternative 1

Coastal Zone Management

This impact analysis considers the six categories of coastal zone enforceable policies: public access, recreation, marine environment, land resources, development, and industrial development. Based on the Proposed Action, the following categories are addressed accordingly.

Public Access and Recreation: As previously described in Section 2.0, the Proposed Action would occur within the boundaries of NBVC Point Mugu where access is controlled and restricted to authorized personnel (NBVC, 2017). There is no public access to the project area and no public recreation opportunities located within the project area. The proposed laser operations from the DESIL facility

would not preclude future public events through advanced scheduling and coordination. Therefore, there would be no effect to public access and recreation.

Marine Environment: The project area does not encompass shoreline and all construction activities would occur away from the shoreline. Direct impacts associated with disturbance of the shoreline would not occur. Implementation of BMPs for erosion and stormwater control would reduce the potential for discharge into the Pacific Ocean or Mugu Lagoon. Similarly, the proposed L Avenue LATS would incorporate stormwater design requirements of Section 438 of the Energy Independence Security Act (EISA) to manage stormwater and avoid water quality impacts to the Pacific Ocean or Mugu Lagoon.

Land Resources: The Proposed Action would result in the permanent loss of 0.11 acre (0.05 ha) of Vancouverian Coastal Dune and Bluff associated vegetation, which is habitat for CLTE and WSPL. Additional indirect impacts to 0.60 acre (0.02 ha) of Vancouverian Coastal Dune and Bluff associated vegetation would be temporarily impacted from vehicles, laydown and other construction related activities. However, with implementation of avoidance and minimization measures, the Proposed Action would have a less than significant impact on biological resources. Section 3.2 discusses potential impacts to the LFRR, WSPL, and CLTE from construction and operations and identifies impact avoidance and minimization measures, also listed in Appendix E. Section 3.4 discusses procedures to prevent runoff and protection of adjacent wetlands to the proposed L Avenue LATS.

The California Coastal Commission concurred with the Navy's determination that the proposed construction and use of DESIL land-based laser target sites at NBVC Point Mugu under Alternative 1 would not adversely affect coastal zone resources (see Appendix A).

Sea Level Rise and Climate Change

Upgrades as part of the Shoreline Protection Repair and Enhancements project, a separate and unconnected action, would provide increased protection against sea level rise and coastal flooding at the proposed L Avenue LATS. For example, Beach Road, parallel to the proposed L Avenue LATS building has been recontoured north of the L Avenue site. The L Avenue site was not listed as a vulnerable area per the Shoreline Protection Repair and Enhancements project. The proposed L Avenue site is protected by a broader beach and more stable dunes. While nearby M Avenue and Building PM-812 were identified as vulnerable areas as part of the Shoreline Protection project, the proposed L Avenue LATS is located 1,914 feet from Building PM-812 and has no history of flooding. In addition, the beach along the L Avenue site is wider (240 feet) compared to the M Avenue site (63 feet) and the L Avenue site has vegetated and more stable dunes compared to the more vulnerable M Avenue area. Furthermore, to minimize risk from potential future sea level rise, the proposed L Avenue site may be elevated one to three feet depending on an engineering analysis in order to provide additional protection. In addition, the Proposed Action does not include any changes to the sea wall. Therefore, implementation of Alternative 1 would not result in significant impacts to coastal resources.

3.3.3.3 Alternative 2

Alternative 2 would include construction of a concrete pad on the northeastern corner of L Avenue of the same size and elevation as proposed in Alternative 1. No building would be constructed; however, the site would include electrical power and communications circuits. The installation of drop arms and conducting land-to-land laser operations and operations tempo would be the same as described for

Alternative 1. Therefore, implementation of Alternative 2 would not result in significant impacts to coastal resources.

3.4 Water Resources

This discussion of water resources includes groundwater, marine waters, floodplains, shorelines, and surface waters consisting of wetlands, lakes, rivers, and streams.

3.4.1 Regulatory Setting

The Federal Water Pollution Control Act, as amended by the Clean Water Act (CWA), is intended to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. The CWA establishes federal limits, through the National Pollutant Discharge Elimination System (NPDES) program, on the amounts of specific pollutants that can be discharged into surface waters to restore and maintain the chemical, physical, and biological integrity of the water. The NPDES program regulates the discharge of point (i.e., end of pipe) and nonpoint sources (i.e., stormwater) of water pollution.

The NPDES stormwater program requires construction site operators engaged in clearing, grading, and excavating activities that disturb 1 acre (0.4 ha) or more to obtain coverage under a NPDES Construction General Permit for stormwater discharges. Construction or demolition that necessitates an individual permit also requires preparation of a Notice of Intent to discharge stormwater and a Stormwater Pollution Prevention Plan (SWPPP) that is implemented during construction. The Construction General Permit requires the development and implementation of a SWPPP and a Stormwater Monitoring Program.

Section 404 of the CWA establishes a program to regulate the discharge of dredged or fill material into waters of the United States, including wetlands. Waters of the United States are defined as (1) traditional navigable waters, (2) wetlands adjacent to navigable waters, (3) nonnavigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow perennially or have continuous flow at least seasonally (e.g., typically 3 months), and (4) wetlands that directly abut such tributaries under Section 404 of the CWA, as amended, and are regulated by USEPA and the U.S. Army Corps of Engineers.

Activities in waters of the United States regulated under this program include fill for development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports) and mining projects. Section 404 requires a permit before dredged or fill material may be discharged into waters of the United States, unless the activity is exempt from Section 404 regulation (e.g., certain farming and forestry activities). Under Section 401 of the CWA, a federal agency may not issue a permit or license to conduct any activity that may result in any discharge into waters of the United States unless a state or authorized tribe where the discharge would originate issuing a Section 401 water quality certification verifying compliance with existing water quality requirements or waives the certification requirement.

Section 10 of the Rivers and Harbors Appropriation Act regulates the placement of fill in navigable waterways. Under Section 10 of the Rivers and Harbors Appropriation Act, Corps jurisdiction extends up to the mean high water of navigable waterways including all tidal waters.

Section 438 of the EISA establishes stormwater design requirements for development and redevelopment projects. Under these requirements, federal facility projects larger than 5,000 square feet (464 square meters) must "maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow."

3.4.2 Affected Environment

The region of influence for water resources in the project area includes the saltmarsh wetlands within the intertidal zone located to the north and east of the proposed L Avenue LATS. The region of influence also includes land beneath the laser beam path from DESIL to each of the three laser target sites (L Avenue and the Alpha and Nike Zeus Pads). The beam would travel in a northwesterly direction mostly over marsh and developed land. The Pacific Ocean is located to the southwest of the project area.

3.4.2.1 Groundwater

NBVC Point Mugu is situated in the Oxnard Plain, a sub-basin of the Santa Clara River Valley Basin. The Oxnard aquifer is a major producer of groundwater and is considered the principal aquifer beneath the Oxnard Plain. Direction of flow in this aquifer is generally toward the Pacific Ocean. The high quality of the water in the Oxnard Aquifer makes it an important source of water for domestic and agricultural use in the region (Navy, 2019b). Groundwater is very shallow throughout Point Mugu, generally ranging from depths of 6 to 9 feet below ground surface, though it could be encountered at shallower depths in some areas.

3.4.2.2 Surface Water

NBVC Point Mugu lies within the Oxnard Plain watershed in the Santa Clara-Calleguas Hydrologic Unit (Navy, 2009). Calleguas Creek, several small unnamed streams, and a system of drainage ditches and culverts that drain the surrounding agricultural area, empty into Mugu Lagoon within NBVC Point Mugu. Mugu Lagoon is also supplied by freshwater runoff from ponds in the Ventura County Game Preserve, which lie west of, and adjacent to, the installation (Navy, 2009).

Mugu Lagoon was included on the 1998 303(d) list of water quality limited segments as impaired for sedimentation/siltation. The Siltation TMDL Technical Document (Los Angeles Regional Water Quality Control Board [LARWQCB], 2005) states the listing was based on the following two studies:

- The US Department of Agriculture, 'Calleguas Creek Watershed Erosion and Sediment Control Plan for Mugu Lagoon' 1995, which concluded "430 acres of lagoon intertidal salt marsh will be converted to upland habitat by the year 2030."
- A 1998 report by the State Water Resources Control Board Bay Protection and Toxic Cleanup Program found limited species quality and diversity among benthic species in Mugu Lagoon. (State Water Resource Control Board [SWRCB], 1998).

Subsequently, it was determined that Mugu Lagoon is no longer impaired by excessive sedimentation because the majority of sediment entering the lagoon via Calleguas Creek passes through and is discharged to the ocean. The two study assessments, habitat conversion and benthic community degradation, each result in a finding of non-impairment due to sedimentation (LARWQCB, 2014).

Various industrial facilities on the installation discharge water under a state-issued general permit (Permit No. CAS000001). The installation has prepared a SWPPP to control the discharge of stormwater that could adversely affect water quality in Calleguas Creek or Mugu Lagoon (Navy, 2009).

3.4.2.3 Marine Waters

Mugu Lagoon is a large tidal estuary of the Pacific Ocean, currently on the CWA 303(d) list for sediment and tissue toxicity (SWRCB, 2020). Surface runoff at NBVC Point Mugu is transported to Calleguas Creek and Mugu Lagoon, and eventually to the Pacific Ocean, via a system of drainage ditches and natural channels. The project area does not encompass any part of the shoreline.

3.4.2.4 Wetlands

The proposed L Avenue site is located adjacent to potentially jurisdictional wetlands and Warm Semi-Desert/ Mediterranean Alkali-Saline Wetland associated habitat (See Figure 3.2-2). Based on a review of existing data and observations during a field visit conducted by personnel from the NBVC Point Mugu Natural Resources office on 26 June 2020, no wetlands or potentially jurisdictional waters are located within the proposed L Avenue LATS footprint. However, jurisdictional waters are located within approximately 25 feet (7.62 meters) of the proposed concrete pad.

3.4.2.5 Flooding

More than half of NBVC Point Mugu including the project area and L Avenue LATS are within the 100-year flood zone of Calleguas Creek (Navy, 2019b). Although there is no historic record of flooding in the L Avenue LATS (NRSW, 2020).

3.4.3 Environmental Consequences

The analysis of water resources in this EA looks at the potential impacts on groundwater, surface water, marine waters, wetlands, and flooding. Groundwater analysis focuses on the potential for impacts to the quality, quantity, and accessibility of the water. The analysis of surface water quality considers the potential for impacts that may change the water quality, including both improvements and degradation of current water quality. Marine waters analysis includes potential changes to physical and chemical characteristics. The impact assessment of wetlands considers the potential for impacts that may change the local hydrology, soils, or vegetation that support a wetland. The analysis of floodplains considers if any new construction is proposed within a floodplain or may impede the functions of floodplains in conveying floodwaters. The analysis of shorelines considers if the Proposed Action would affect shoreline ecological functions such as channel movement and hydrological systems, flooding or storm surge areas, areas of erosion and sedimentation, water quality and temperature, presence of nutrients and pathogens, and sites with the potential for protection or restoration.

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 existing conditions. Therefore, no impacts to water resources would occur with implementation of the No Action Alternative.

3.4.3.2 Alternative 1

Construction

Groundwater

Construction is not anticipated to reach depths that would encounter groundwater; however, if encountered during trenching or excavation, a NPDES Dewatering Permit would be obtained and NBVC Dewatering procedures would be followed.

The L Avenue LATS building, parking and access would increase the amount of impervious surface by approximately 0.14 acre (0.06 ha). The increase in impervious area would result in a localized reduction in infiltration capacity within the Alternative 1 footprint; however, the total amount 0.14 acre (0.06 ha) of impervious area would be negligible when added to the total developed areas of NBVC Point Mugu.

Given the minimal change associated with the Proposed Action to the total installation-wide impervious area, no significant net reduction of infiltration or recharge capacity is anticipated. Negligible impacts to the Oxnard Plain groundwater basin would occur. In addition, the Proposed Action would incorporate low impact design features, which could include minimizing impervious surfaces, diverting flow from impervious surfaces to areas where it could infiltrate into the groundwater table, and providing biofiltration or other infiltration facilities to also allow for groundwater recharge.

Surface Water

The negligible increase in impervious surface area would result in a negligible increase in stormwater runoff during rain events. Development of the L Avenue LATS would impact less than 1 acre (0.4 ha); therefore, the construction contractor would not be required to prepare and implement a SWPPP under compliance with the California Construction General Permit (Order No. 2009-0009-DWQ). However, the contractor would be required to comply with Phase II NPDES rule as outlined in the Phase II Small MS4 General Permit 2013-0001-DWQ (section F.5.g) to address construction and post-construction runoff, as construction would create 2,500 square feet (0.05 acres) or more of impervious surface. Site specific stormwater BMPs would be implemented to minimize erosion and impacts to surface water resulting from grading and construction activities.

BMPs would be implemented to prevent inadvertent runoff of potential contaminants, such as construction debris, and petroleum products. The BMPs would also minimize erosion and impacts to surface water resulting from construction activities. BMPs could include the installation of fiber rolls, sediment traps, jute netting, check dams, and other measures. The construction contractor would coordinate with the NBVC Point Mugu Natural Resources Office staff, the Construction Manager, and the Engineering Technician to ensure the proper BMPs are installed and maintained. For example, fiber rolls slow down the flow of water, capture sediment and organic matter, and diffuse water flow across the land surface. But runoff barriers such as fiber rolls can malfunction rather quickly and require frequent inspection, maintenance, and replacement. Therefore, workers would monitor and inspect all fiber rolls (and other BMPs) frequently for effectiveness.

Construction activities would have the potential for generation of pollutants including sediment and other construction-related constituents (such as nutrients, trace metals, oil and grease, miscellaneous waste, and other chemicals). Any runoff would then have the potential to transport suspended sediment and other constituents away from the area. As such, the project design would include BMPs and

engineering controls to stabilize cut slopes and measures to revegetate exposed surfaces upon construction completion, to minimize soil loss and impacts to surface water quality. In addition, the project would be constructed in accordance with UFC 3-210-10, *Low Impact Development*, which provides technical criteria, technical requirements, and references for the planning and design for projects to comply with stormwater requirements.

Marine Waters

Implementation of BMPs for erosion and stormwater control would reduce the potential for discharge into the Pacific Ocean or Mugu Lagoon. Similarly, the proposed L Avenue LATS would incorporate stormwater design requirements of Section 438 of the EISA to manage stormwater and avoid water quality impacts to the Pacific Ocean or Mugu Lagoon.

Wetlands

Salt marsh wetlands associated with Mugu Lagoon are located adjacent to the L Avenue project footprint. Imported clean fill material would be used to potentially raise the proposed L Avenue LATS from one to three feet above Beach Road grade to address potential flooding issues (discussed under Flooding, below). Grading would result in roughly 33,000 cubic yards of earthwork. A qualified wetland biologist would flag adjacent wetlands and potentially jurisdictional waters outside of the project footprint prior to earth moving activities or vegetation removal. With avoidance measures listed in Appendix E, construction of the proposed L Avenue LATS is not likely to result in adverse effects to jurisdictional waters or wetlands. Therefore, no CWA permits would be required.

Flooding

While situated within the 100-year floodplain, there has been no history of flooding in the L Avenue LATS (NBVC, 2020). To avoid potential impacts from flooding, the site grade might be raised from one to three feet above the street grade on the Beach Road frontage. Potential flood hazard impacts would be minimized or avoided with implementation of BMPs, as well as flood control management strategies contained in the 2019 INRMP. No new permanent structures would be constructed at Nike Zeus and Alpha Pads. Alternative 1 would be consistent with the regulations outlined in EO 11988, *Floodplain Management*. Flood proofing and other flood-protection measures would be applied to the proposed facilities, as deemed appropriate.

Operations

Although the operation of lasers is not anticipated to result in groundwater, surface water, marine waters, or wetland impacts because the lasers would not be fired at the ground, there would be a potential for targets to melt, smoke, or burn, resulting in metal debris, ash, and petroleum products. Following each laser operation, debris resulting from laser impacts on targets (e.g., metal fragments, hazardous materials, etc.) would be promptly disposed of and would not be discarded on site. Immediate cleanup of testing constituents at the DESIL and each of the three land-based laser target sites would prevent impacts to water resources. Furthermore, implementation of BMPs (e.g., development and implementation of a hazardous materials and wastes management plan by the Navy) would eliminate the potential for impacts to water quality. Typical measures that would be included in such a plan to directly reduce impacts include the removal of debris such as ash or metal fragments at land-based laser target sites and using secondary containment at each target site to ensure

any potentially hazardous materials or debris would not leave the site to potentially impact water resources.

The 8 to 10 personnel associated with the Proposed Action would negligibly increase long-term demand for potable water because most of these personnel would include those currently working at NBVC Point Mugu or NSWC PHD. There would be no impact to regional water supply.

Summary

Impacts to groundwater, surface water, marine water, wetlands, and floodplains from construction of the L Avenue LATS and laser operations would not be significant with implementation of avoidance measures presented in Appendix E. Furthermore, the Navy has prepared and is implementing an erosion control plan to assess and reduce soil erosion on NBVC Point Mugu (Navy, 2019b). Therefore, implementation of Alternative 1 would not result in significant impacts to water resources.

3.4.3.3 Alternative 2

Under Alternative 2, the proposed grading and development of the concrete pad would involve a similar amount of earthwork and imported fill materials as required under Alternative 1. If implemented, Alternative 2 would follow the same stormwater BMPs and wetland avoidance measures as required under Alternative 1. Therefore, implementation of Alternative 2 would not result in significant impacts to water resources.

4 Other Considerations Required by NEPA

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

In accordance with 40 CFR section 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 4-1 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 4-1 Principal Federal and State Laws Applicable to the Proposed Action

Applicable Legal Requirements and Policies	*Status of Compliance*
National Environmental Policy Act (NEPA); CEQ NEPA implementing regulations; Navy procedures for Implementing NEPA (42 U.S.C. sections 4321-4370h, 40 CFR parts 1500-1508, 32 CFR part 775)	This EA has been prepared in accordance with NEPA, CEQ regulations implementing NEPA, and Navy NEPA procedures.
Clean Air Act (42 U.S.C. section 7401 et seq.)	Under the Proposed Action, no significant impacts to air quality would occur. The Navy has prepared a RONA for Clean Air Act conformity (Appendix B).
Clean Water Act (33 U.S.C. section 1251 et seq.)	The Navy would implement the Proposed Action in compliance with the Phase II NPDES rule as outlined in the Phase II Small MS4 General Permit 2013-0001-DWQ. Proposed construction activities would follow BMPs to limit potential water quality impacts.
Coastal Zone Management Act (16 U.S.C. section 1451 et seq.)	The Navy prepared a Coastal Consistency Negative Determination and submitted it to the California Coastal Commission. In a letter to the Navy dated 3 February 2021, the California Coastal Commission concurred with the Navy's determination that the Proposed Action would not adversely affect coastal zone resources (see Appendix A).
National Historic Preservation Act (54 U.S.C. sections 300101 et seq.)	There are no historic properties located within the area of potential effect. The Proposed Action is a project covered under the 2015 Programmatic Agreement between NBVC and the California SHPO (Navy 2015a). NBVC has determined that the Proposed Action can be approved with a finding of 'No Historic Properties Affected' consistent with Stipulation 8A of the 2015 NBVC Programmatic Agreement and 36 CFR 800.4(d)(1). The Proposed Action would be reported to the California SHPO as part of NBVC's annual reporting, per the 2015 Programmatic Agreement.
Endangered Species Act (16 U.S.C. section 1531 et seq.)	The Navy prepared a Biological Assessment and consulted with the USFWS regarding potential impacts to LFRR, WSPL, and CLTE. On 16 April 2021, in their Biological Opinion, the USFWS concurred with the Navy's determination that construction and testing activities may affect but is not likely to adversely affect LFRR and WSPL. In addition, the USFWS concluded that the Proposed Action would not jeopardize the continued existence or recovery of CLTE (see Appendix F).
Federal Aviation Administration requirements per 14 CFR Part 77 and FAA Form 7460-1, *Notice of Proposed Construction or Alteration*.	Prior to construction and operations, the Navy would comply with all FAA requirements to ensure there are no potential hazards to aircraft.
Migratory Bird Treaty Act (16 U.S.C. sections 703-712)	While construction under the Proposed Action may not meet the definition of military readiness activities that are exempt from the

Table 4-1 Principal Federal and State Laws Applicable to the Proposed Action

Applicable Legal Requirements and Policies	*Status of Compliance*
	MBTA (whereas laser operations do), construction does not involve deliberate acts intended to take migratory birds. In addition, construction would be limited to non-breeding seasons of migratory birds. The Navy would continue practices designed to minimize the incidental take of migratory birds as part of the Proposed Action. The Proposed Action would be in compliance with the MBTA.
Bald and Golden Eagle Protection Act (16 U.S.C. section 668)	The Proposed Action would be in compliance with the Bald and Golden Eagle Protection Act.
Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (42 U.S.C. section 9601 et seq.)	The Navy would be in compliance with CERCLA and would comply with all Land Use Controls.
Resource Conservation and Recovery Act (RCRA) (42 U.S.C. section 6901 et seq.)	The Navy would be in compliance with RCRA and would comply with all Land Use Controls.
Toxic Substances Control Act (TSCA) (15 U.S.C. sections 2601–2629)	The Navy would be in compliance with TSCA and would comply with all Land Use Controls.
Executive Order (EO) 11988, Floodplain Management	The project area is located within the 100-year floodplain. Therefore, flood-protection features would be incorporated into the design of the proposed facilities, as deemed appropriate. The L Avenue LATS may be elevated one to three feet depending on an engineering analysis in order to provide protection against potential sea level rise and associated effects.
EO 12088, Federal Compliance with Pollution Control Standards	The Proposed Action would not exceed NAAQS established by the USEPA under the Clean Air Act.
EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations	The Navy has determined that the Proposed Action would not cause disproportionately high and adverse health or environmental effects on any minority or low-income populations.
EO 13045, Protection of Children from Environmental Health Risks and Safety Risks	The Navy has determined that the Proposed Action would not disproportionately expose children to environmental health risks or safety risks.
EO 13175, Consultation and Coordination with Indian Tribal Governments	The Navy's Cultural Resources Program approved the Proposed Action with a finding of No Historic Properties Affected, consistent with Stipulation III.D.2 of the Programmatic Agreement (Navy 2015a); Indian Tribal Governments were signatories to the Programmatic Agreement.
EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management	The Proposed Action would incorporate sustainable development concepts to achieve optimum resource efficiency, sustainability, and energy conservation and construction materials would be recycled in accordance with the DoD Strategic Sustainability Performance Plan.
EO 13696, Planning for Federal Sustainability in the Next Decade	The Proposed Action would incorporate sustainable development concepts to achieve optimum resource efficiency, sustainability, and energy conservation.
Unified Facilities Criteria 3-210-10, Low Impact Development and the EISA of 2007	The Proposed Action would comply with stormwater requirements.

4.2 Irreversible or Irretrievable Commitment 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 and the consumption of fuel, oil, and lubricants for construction vehicles. The use of electricity, natural gas, water, and fuel consumption and demand for services would increase negligibly as a result of implementation of the Proposed Action. The Proposed Action would require construction materials and energy. The total amount of construction materials (e.g., concrete and steel) required for the Proposed Action would be relatively small when compared to the resources available in the region. The construction materials and energy required for construction are not in short supply. Moreover, the use of construction materials and energy would not have an adverse impact on the continued availability of these resources. The commitment of energy resources to implement the Proposed Action would not be excessive in terms of region-wide usage. Implementation of the Proposed Action would not result in significant irreversible or irretrievable commitment of resources.

4.3 Unavoidable Adverse Impacts

It was determined in this EA that the alternatives considered would not result in any significant impacts. No resource area would be subject to significant adverse impacts that would require mitigation. Appendix E presents the resource area impact avoidance and minimization measures.

4.4 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.

As discussed in Chapter 3, the Proposed Action would result in both short- and long-term environmental effects. However, no element of the Proposed Action is expected to result in the types of impacts that would reduce environmental productivity, have long-term impacts on sustainability, affect biodiversity, or narrow the range of long-term beneficial uses of the environment. In summary, implementation of 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.

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February 3, 2021

Captain J.E. Chism
Commanding Officer
Department of the Navy
Naval Base Ventura County
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Point Mugu, CA 93042

ATTN: Deb McKay

Re: Negative Determination ND-0042-20 (Directed Energy Systems Integration Laboratory Land Based Laser Target Sites at Naval Base Ventura County Point Mugu)

Dear Captain Chism:

The Coastal Commission staff has received the above-referenced negative determination submitted by the United States Department of the Navy (Navy) for construction of a land-based laser target site and the conduct of land-to-land directed energy systems testing activities from the newly constructed Directed Energy Systems Integration Laboratory at Naval Base Ventura County Point Mugu (reviewed and concurred with by the Commission through ND-0012-19). The purpose of the proposed project is to support current and future directed energy weapon testing programs in order to accelerate the Navy's efforts to deliver laser systems to the field. The target site is needed to further the Navy's directed energy test program with land-based target sites in an operationally relevant maritime environment. The Navy has stated that the proposed project furthers its statutory responsibility to provide combat-ready forces and to support the Department of Defense's directed energy test program requirements for operationally realistic directed energy engagements in both marine and land environments.

As part of the project, the Navy proposes to construct a new 400 to 500 square foot one story (15 to 18 feet high) building to house electro-optical instrumentation so it can study and verify laser system operations prior to live testing. The building would also be outfitted with an Instrument Control Room protected from laser energy for operators who would control/monitor equipment during lasing and accomplish data capture. Building construction may include earthwork activities to raise the base elevation by one to three feet. In addition, the Navy would install up to five new manually operated drop arms

(temporary safety barricades) across the following roads to limit access to the area between the DESIL and the target sites during laser operations: South L Avenue at the 18th Street intersection, Beach Road at South M Avenue, Beach Road on the western side of G Avenue intersection, 20th Street west of G Avenue, and the entrance to Surfer Beach. All of these roads are located fully within Naval Base Ventura County Point Mugu (NBVCPM) and are not available for public use. Finally, the Navy also proposes to install two land-based mobile target sites located at the existing Nike Missile Zeus Pad and Alpha Pad. The mobile target sites would consist of container express (CONEX) boxes (or similar), trailers, instrumentation equipment, target boards, and other temporary support equipment such as portable generators and/or chillers.

Proposed operations would involve scheduled testing activities that direct laser energy at the three land-based targets from fixed laser sources located at the Directed Energy Systems Integration Laboratory. The Navy estimates conducting laser testing up to 116 days per year, including some events at night. Typical test event duration would be several hours or more in a 24-hour period. Multiple lasers could be operated within an event. Typical event duration time would include the initial set-up, road closure, testing, an all-safe determination, then road opening.

The project would be located in an industrial area of NBVCPM, where the Navy controls access, and therefore will not affect public access or recreation. The Navy will implement standard construction Best Management Practices and spill prevention and clean- up plans to minimize any adverse effects from accidental releases of fuels, oils, debris or other construction materials. No in-water construction activity is proposed and direct impacts associated with disturbance of the shoreline would not occur. Construction would have no impact on the marine environment and during construction, best management practices (BMPs) would be implemented to minimize impacts to marine water quality. There is no proposed in-water construction activity. Direct impacts associated with disturbance of the shoreline would not occur and construction would have no impact on the marine environment. During construction, best management practices (BMPs) would be implemented to minimize impacts to marine water quality. BMPs could include the installation of fiber rolls, sediment traps, jute netting, check dams, and other measures. The construction contractor would coordinate with the NBVC Point Mugu Natural Resources Office staff, the Construction Manager, and the Engineering Technician to ensure the proper BMPs are installed and maintained. For example, fiber rolls slow down the flow of water, capture sediment and organic matter, and diffuse water flow across the land surface.

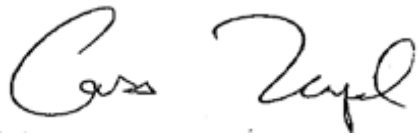
The project would occur outside of all areas of wetlands and sensitive plant and wildlife habitat. However, due to the presence of federally listed bird species on NBVCPM (Ridgway's rail, Western snowy plover and California least tern), the Navy submitted a Biological Assessment to the U.S. Fish and Wildlife Service in October 2020 and is proceeding with consultation under Section 7 of the federal Endangered Species Act.

Under the federal consistency regulations [15 CFR Section 930.35(a)], a negative determination can submitted for an activity "…which is the same or is similar to activities for which consistency determinations have been prepared in the past." The proposed

project is similar to previously concurred with consistency and negative determinations for Navy construction and operations activities on Naval Base Ventura County Point Mugu and San Nicolas Island (ND-0012-19 for Directed Energy Systems Integration Laboratory (DESIL); ND-0007-18 for the U.S. Coast Guard Air Station Relocation; CD-0001-16 for the NBVC Point Mugu Shoreline Protection Repairs; CD-002-01 for Point Mugu Sea Range Testing and Training; ND-017-09 for Navy Laser Testing and Training Program, Point Mugu Sea Range; ND-0207-13 for Point Mugu Sea Range Countermeasures Testing and Training; and ND-0213-13 for Directed Energy Test Facilities at San Nicolas Island).

In conclusion, the Coastal Commission staff **agrees** that the proposed construction and use of Directed Energy Systems Integration Laboratory land-based laser target sites at Naval Base Ventura County Point Mugu are similar to the above-referenced determinations and will not adversely affect coastal zone resources. We therefore **concur** with your negative determination made pursuant to 15 CFR Section 930.35 of the NOAA implementing regulations. Please contact Cassidy Teufel at Cassidy.Teufel@coastal.ca.gov or (415) 904-5245 if you have any questions regarding this matter.

Sincerely,



(for)

JOHN AINSWORTH
Executive Director

DEPARTMENT OF THE NAVY
NAVAL BASE VENTURA COUNTY
311 MAIN ROAD, SUITE 1
POINT MUGU, CA 93042-5033

IN REPLY REFER TO
5090
Ser N0000CV/0884
11 Dec 20

Mr. Larry Simon
Manager, Federal Consistency Division
California Coastal Commission
455 Market Street, Suite 228
San Francisco, California 94105-2219

Dear Mr. Simon:

SUBJECT: COASTAL CONSISTENCY NEGATIVE DETERMINATION FOR DIRECTED ENERGY SYSTEMS INTEGRATION LABORATORY LAND BASED LASER TARGET SITES AT NAVAL BASE VENTURA COUNTY POINT MUGU CA

The Navy proposes to construct a land-based laser target site and conduct land-to-land directed energy systems testing activities from the newly constructed Directed Energy Systems Integration Laboratory at Naval Base Ventura County, Point Mugu, CA.

This submittal is in compliance of Section 930.35 of the National Oceanic and Atmospheric Administration Federal Consistency Regulations (15 CFR 930). The Navy has determined that the proposed action would have no effect to coastal resources for the reasons identified in its Coastal Consistency Negative Determination (enclosure (1)).

The Navy requests your concurrence on this proposed project. Please email a letter of concurrence to Ms. Deb McKay, Region National Environmental Policy Act Coordinator at deborah.mckay@navy.mil. If you have any questions or need further information, please contact Ms. Deb McKay at (619) 705-5403.

Sincerely,

J. E. CHISM
Captain, U.S. Navy
Commanding Officer

Enclosure: 1. Coastal Consistency Negative Determination

COASTAL CONSISTENCY NEGATIVE DETERMINATION
FOR
DIRECTED ENERGY SYSTEMS INTEGRATION LABORATORY LAND-BASED LASER TARGET SITES AT NAVAL BASE VENTURA COUNTY, POINT MUGU, CA

In accordance with the Federal Coastal Zone Management Act of 1972 (CZMA), as amended, Section 307(c)(1), the United States (U.S.) Navy (Navy) has determined that the construction and operation of land-based laser target sites at Naval Base Ventura County (NBVC), Point Mugu, California would have no effect on coastal resources or uses within the coastal zone. Therefore, the Navy has concluded that a Coastal Consistency Determination is not required and is requesting your concurrence with this Coastal Consistency Negative Determination (CCND) in compliance with the Ocean and Coastal Resource Management regulations (15 Code of Federal Regulations [CFR] Section 930.35).

This submittal is similar to previously concurred determinations for recent infrastructure improvements on NBVC Point Mugu and directed energy/laser testing activities on Point Mugu Sea Range and San Nicolas Island: ND-0012-19 for Directed Energy Systems Integration Laboratory (DESIL); ND-0007-18 for the U.S. Coast Guard Air Station Relocation; CD-0001-16 for the NBVC Point Mugu Shoreline Protection Repairs; CD-002-01 for Point Mugu Sea Range Testing and Training; ND-017-09 for Navy Laser Testing and Training Program, Point Mugu Sea Range; ND-0207-13 for Point Mugu Sea Range Countermeasures Testing and Training; and ND-0213-13 for Directed Energy Test Facilities at San Nicolas Island. In those decisions, the California Coastal Commission (Commission) found that the proposed activities would either have no effect on coastal resources or uses and would otherwise be consistent with relevant management program enforceable policies (15 CFR Section 930.33[a][1]) and Coastal Resources Planning and Management Policies (CRPMP). The Commission concurred that the proposed activities complied with the policies of the CRPMP.

The Navy is preparing an EA for the Proposed Action. The EA provides comprehensive descriptions for the action alternatives and describes the resources that could be affected, provides an analysis of the potential environmental consequences, and identifies proposed minimization measures to avoid/minimize adverse effects. The Navy published the Draft EA and provided a public review and comment period from 9 to 23 October 2020. No public comments on the EA were received.

PROJECT LOCATION

NBVC Point Mugu is comprised of 4,500 acres (1,821 hectare (ha)) of land, including support facilities and infrastructure and is situated along the coast of Ventura County, CA, approximately 5 miles south of Oxnard and 50 miles west of Los Angeles (Figure 1). NBVC is adjacent to the Point Mugu Sea Range, a 36,000-square mile sea test range extending more than 180 nautical miles seaward from the coast. Proximity to the Point Mugu Sea Range represents a superior

geographical location for direct energy (DE) testing of high energy lasers in a maritime environment.

BACKGROUND, PURPOSE OF AND NEED FOR PROJECT

In 2019, the Navy proposed and analyzed the construction of the DESIL. As referenced above a CCND was prepared and submitted to the California Coastal Commission, and the Commission concurred with the Negative Determination on May 31, 2019. At that time, the Navy recognized that consultation could occur in the future for the land-based target when viable alternatives were determined. The Navy has since identified land-based target sites on NBVC Point Mugu that meet the purpose and need against screening factors (e.g., located at or near shore, line of sight, adequate size, compatibility, and controlled access).

The purpose of the Proposed Action is to support current and future DE weapon testing programs at DESIL in order to accelerate the Navy's efforts to deliver laser systems to warfighters. The Proposed Action is needed to further the Navy's DE Test Program with land-based laser target sites in an operationally relevant maritime environment. In this regard, the Proposed Action furthers the Navy's statutory responsibility in 10 United States Code (U.S.C.) 8062 to provide combat-ready forces and to support the Department of Defense's DE test program requirements for operationally realistic DE engagements in both marine and land environments.

PROJECT DESCRIPTION

This CCND evaluates the proposed new construction of a fully instrumented Land-Based Laser Target Site (LATS) at L Avenue, and would also include operation of land-to-land DE operations from the DESIL to the new LATS building and two land-based mobile target sites located at the existing Nike Zeus and Alpha Pads (Figure 2).

Construction

The LATS at L Avenue would include a new 400- to 500-square-foot permanent one-story (approximately 15 to 18 feet high) building to house electro-optical instrumentation for the characterization of laser beams, to perform studies, and to verify laser system operations prior to live testing and evaluation (Figure 3). The building would also contain an Instrument Control Room protected from laser energy for operators who control/monitor equipment during lasing and accomplish data capture.

The Navy would also install up to five new manually operated drop arms across the following roads to limit access to the area between the DESIL and the target sites during laser operations: South L Avenue at the 18th Street intersection, Beach Road at South M Avenue, Beach Road on the western side of G Avenue intersection, 20th Street west of G Avenue, and the entrance to Surfer Beach (see Figure 2).

Operations

The Navy would conduct land-to-land DE systems testing activities from the DESIL to the proposed land-based LATS and two additional land-based mobile target sites located at the

existing Nike Zeus Pad and Alpha Pad. The mobile target sites at the Nike Zeus Pad and Alpha Pad would consist of container express (CONEX) boxes (or similar), trailers, instrumentation equipment, target boards, and other temporary support equipment such as portable generators and/or chiller.

Operations would involve scheduled testing activities that direct laser energy at the three land-based targets from fixed laser sources located at DESIL. The Navy estimates conducting laser testing up to 116 days/year, including some events occurring during the nighttime. Typical test event duration would be several hours or more in a 24-hour period. Multiple lasers could be operated within an event. Typical event duration time would include the initial set-up, road closure, testing, an all-safe determination, then road opening.

EFFECTS ANALYSIS

As defined in Section 304 of the CZMA, the term "coastal zone" does not include "lands the use of which is by law subject solely to the discretion of or which is held in trust by the Federal Government" (16 U.S.C. §1453[1]).

NBVC Point Mugu is owned and operated by the Navy and, therefore, excluded from the coastal zone. Because NBVC Point Mugu is excluded from the coastal zone, it is also not subject to the Ventura County Local Coastal Program.

The Navy recognizes that federal actions on land excluded from the coastal zone may affect resources and uses within the coastal zone. Although NBVC Point Mugu land is federal government property and excluded from both the coastal zone and Ventura County Local Coastal Program, the Navy conducted an effects analysis to evaluate potential impacts to coastal resources and uses of the state's coastal zone. The Navy has also analyzed the relevant management program enforceable policies (15 CFR Section 930.33[a][1]) and CRPMP.

Sections of the California Coastal Act relevant to the Proposed Action, as determined by the Navy, include: Article 2 – Public Access (Section 30210); Article 3 - Recreation (Section 30220); Article 4 – Marine Environment (Sections 30230, 30231, and 30232); Article 5 – Land Resources (Sections 30240 and 30244); and Article 6 – Development (Sections 30251, 30253, and 30255). Sections and articles of the California Coastal Act not addressed below are not relevant to the Proposed Action.

Article 2 – Public Access (CRPMP Section 30210) and Article 3 Recreation (CRPMP Section 30220)

Article 2, Section 30210 – Public Access; Recreational Opportunities; Posting. In carrying out the requirement of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.

Article 3, Section 30220 – Recreation; Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.

The Proposed Action would occur within the boundaries of NBVC Point Mugu where access is controlled and restricted to authorized personnel. There is no public access to the project area and no public recreation opportunities located within the project area. The Proposed Action would be compatible with existing adjacent land uses.

NBVC Point Mugu recreational beaches are currently restricted to base personnel because of mission activities, range operations, and sensitive natural resources. During laser operations, the proposed drop arm gates would temporarily block access to certain roads and NBVC recreational beaches to ensure safety (specifically G Avenue and Beach Road). Based on the location of the proposed drop arm gates, other NBVC recreational beach areas may still be accessible via Laguna Road to provide a safe distance from operations while providing recreational access to authorized base swimmers and surfers. Road closures may vary depending on operational needs and scheduling. While the majority of operations could occur during the week, some may occur over the weekend. Naval Surface Warfare Center Port Hueneme Division would coordinate with the NBVC Point Mugu Command Duty Officer to communicate proposed laser operation scheduling and would strive to limit base road closures to recreational beaches to the minimum amount of time possible. Other outdoor recreation activities at NBVC Point Mugu would still be safely accessible during the limited times of beach closures.

For recreational boaters/vessels, public access to the nearshore water adjacent to the shoreline is restricted by an established U.S. Army Corps of Engineers Restricted Area 33 CFR 334.1126 zone, denoted on nautical charts. Access for other activities, such as fishing and surfing, is also controlled by NBVC Instruction 1710.4B, Recreational Use of NBVC Beaches and Beach Front Waterways, which allows for closures due to testing and training. In addition, procedures have been codified in range instructions to inform the public of laser testing through the Notice to Mariners issued for each test event. Proposed construction or operations using the land-based target sites would not encroach upon or affect nearby recreational vessel use. As discussed in ND-0012-19, the proposed laser operations from the DESIL facility on to the Point Mugu Sea Range would not preclude future public events through advanced scheduling and coordination.

Therefore, there would be no effect to public access or recreation.

Article 4 – Marine Environment (CRPMP Sections 30230 *et seq.*)

Section 30230 – Marine Resources; Maintenance. Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.

Section 30231 – Biological Productivity; water quality. The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

Section 30232 – Oil and hazardous substance spills. Protection against the spillage of crude oil, gas, petroleum products, or hazardous substances shall be provided in relation to any development or transportation of such materials. Effective containment and cleanup facilities and procedures shall be provided for accidental spills that do occur.

There is no proposed in-water construction activity. Direct impacts associated with disturbance of the shoreline would not occur and construction would have no impact on the marine environment.

During construction, best management practices (BMPs) would be implemented to minimize impacts to marine water quality.

Groundwater. Construction is not anticipated to reach depths that would encounter groundwater; however, if encountered during trenching or excavation, a National Pollution Discharge Elimination System Dewatering Permit would be obtained and NBVC Dewatering procedures would be followed.

The L Avenue LATS building, parking and access would increase the amount of impervious surface by approximately 0.14 acre (0.06 ha). The increase in impervious area would result in a localized reduction in infiltration capacity within the project footprint; however, the total amount 0.14 acre (0.06 ha) of impervious area would be negligible when added to the total developed areas of NBVC Point Mugu.

Given the minimal change associated with the Proposed Action to the total installation-wide impervious area, no significant net reduction of infiltration or recharge capacity is anticipated. Negligible impacts to the Oxnard Plain groundwater basin would occur. In addition, the Proposed Action would incorporate low impact design features, which could include minimizing impervious surfaces, diverting flow from impervious surfaces to areas where it could infiltrate into the groundwater table, and providing biofiltration or other infiltration facilities to also allow for groundwater recharge.

Surface Water. The 0.14 acre (0.06 ha) increase in impervious surface area would result in a negligible increase in stormwater runoff during rain events. Development of the L Avenue LATS would impact less than 1 acre (0.06 ha); therefore, the construction contractor would not be

required to prepare and implement a Storm Water Pollution Prevention Plan under compliance with the California Construction General Permit (Order No. 2009-0009-DWQ). However, the contractor would be required to comply with Phase II National Pollution Discharge Elimination System rule as outlined in the Phase II Small MS4 General Permit 2013-0001-DWQ (section F.5.g) to address construction and post-construction runoff, as construction would create 2,500 square feet (0.05 acres) or more of impervious surface. Site specific stormwater BMPs would be implemented to minimize erosion and impacts to surface water resulting from grading and construction activities.

BMPs would be implemented to prevent inadvertent runoff of potential contaminants, such as construction debris, and petroleum products. The BMPs would also minimize erosion and impacts to surface water resulting from construction activities. BMPs could include the installation of fiber rolls, sediment traps, jute netting, check dams, and other measures. The construction contractor would coordinate with the NBVC Point Mugu Natural Resources Office staff, the Construction Manager, and the Engineering Technician to ensure the proper BMPs are installed and maintained. For example, fiber rolls slow down the flow of water, capture sediment and organic matter, and diffuse water flow across the land surface. But runoff barriers such as fiber rolls can malfunction rather quickly and require frequent inspection, maintenance, and replacement. Therefore, workers would monitor and inspect all fiber rolls (see Table 1, section 3.4 and other BMPs) frequently for effectiveness.

Construction activities would have the potential for generation of pollutants including sediment and other construction-related constituents (such as nutrients, trace metals, oil and grease, miscellaneous waste, and other chemicals). Any runoff would then have the potential to transport suspended sediment and other constituents away from the area. As such, the project design would include BMPs and engineering controls to stabilize cut slopes and measures to revegetate exposed surfaces upon construction completion, to minimize soil loss and impacts to surface water quality. In addition, the project would be constructed in accordance with United Facilities Code (UFC) 3-210-10, Low Impact Development, which provides technical criteria, technical requirements, and references for the planning and design for projects to comply with stormwater requirements.

Marine Waters. Implementation of BMPs for erosion and stormwater control would reduce the potential for discharge into the Pacific Ocean or Mugu Lagoon. Similarly, the proposed L Avenue LATS would incorporate stormwater design requirements of Section 438 of the Energy Independence Security Act to manage stormwater and avoid water quality impacts to the Pacific Ocean or Mugu Lagoon.

Wetlands. Salt marsh wetlands associated with Mugu Lagoon are located adjacent to the L Avenue project footprint. Based on a review of existing data and observations during a field visit conducted by personnel from the NBVC Point Mugu Natural Resources office on 26 June 2020, no wetlands or potentially jurisdictional waters are located within the proposed L Avenue LATS

footprint. The nearest known jurisdictional waters are located within approximately 25 feet (7.62 meters) of the project area. Imported clean fill material would be used to potentially raise the proposed L Avenue LATS from one to three feet above Beach Road grade to address potential flooding issues (discussed under Flooding, below). Grading would result in roughly 33,000 cubic yards of earthwork. A qualified wetland biologist would flag adjacent wetlands and potentially jurisdictional waters outside of the project footprint prior to earth moving activities or vegetation removal (see Table 1, section 3.4). With additional avoidance measures listed in Table 1, construction of the proposed L Avenue LATS is not likely to result in adverse effects to jurisdictional waters or wetlands. Therefore, no Clean Water Act permits would be required.

Flooding. While situated within the 100-year floodplain, there has been no history of flooding at the proposed L Avenue LATS area. To avoid potential impacts from flooding, the site grade might be raised from one to three feet above the street grade on the Beach Road frontage. Potential flood hazard impacts would be minimized or avoided with implementation of BMPs, as well as flood control management strategies contained in the NBVC Integrated Natural Resources Management Plan. No new permanent structures would be constructed at Nike Zeus and Alpha Pads. The project would be consistent with the regulations outlined in Executive Order (EO) 11988, Floodplain Management. Flood proofing and other flood-protection measures would be applied to the proposed facilities, as deemed appropriate.

Although the operation of lasers is not anticipated to result in groundwater, surface water, marine waters, or wetland impacts because the lasers would not be fired at the ground, there would be a potential for targets to melt, smoke, or burn, resulting in metal debris, ash, and petroleum products. Following each laser operation, debris resulting from laser impacts on targets (e.g., metal fragments, hazardous materials, etc.) would be promptly disposed of and would not be discarded on site. Immediate cleanup of testing constituents at the DESIL and each of the three land-based laser target sites would prevent impacts to water resources. Furthermore, implementation of BMPs (e.g., development and implementation of a hazardous materials and wastes management plan by the Navy) would eliminate the potential for impacts to water quality (see Table 1, section 3.4). Typical measures that would be included in such a plan and that would serve to directly reduce impacts include the removal of debris such as ash or metal fragments at land-based laser target sites and secondary containment would be used at each target site to ensure any potentially hazardous materials or debris would not leave the site to potentially impact water resources. The 8 to 10 personnel associated with the Proposed Action would negligibly increase long-term demand for potable water because most of these personnel would include those currently working at NBVC Point Mugu or Naval Surface Warfare Center Port Hueneme Division. There would be no impact to regional water supply.

Therefore, with implementation of the avoidance and minimization measures (see Table 1) and BMPs, there would be no effects to marine resources, biological productivity, and water quality in the coastal zone.

Article 5 – Land Resources (CRPMP Sections 30240 *et seq.*)

Section 30240 – Environmentally Sensitive Habitat Areas; Adjacent Developments. (a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas. (b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.

NBVC Point Mugu consists of a developed area, dominated by non-native vegetation, and a large salt marsh estuary and beach that supports a variety of native plants and wildlife, including special status species.

One federally and state endangered plant species occurs on NBVC Point Mugu, the salt marsh bird's-beak (Chloropyron maritimum subsp. Maritimum). This species is documented as occurring within the action area but not in the construction footprint at the L Avenue LATS. Salt marsh bird's-beak has never been documented as occurring at L Avenue during annual plant surveys primarily because there is a lack of suitable habitat at the site except for a limited (less than five percent) transition area between the back dune to saltmarsh habitat. Although salt marsh bird's-beak has never been documented within the construction footprint at the L Avenue LATS, a focused preconstruction survey by qualified biologists would be conducted (see Table 1, section 3.2). Thus, the Navy has determined construction or operations would have no effect on salt marsh bird's-beak.

Although the federally endangered Least bell's vireo (Vireo bellii pusillus) and tidewater goby (Eucyclogobius newberryi), occur on NBVC Point Mugu, they do not occur in the action area because it does not contain suitable habitat. For example, historic occurrences are two miles from the action area for Least bell's vireo according to the 2019 Integrated Natural Resources Management Plan. Therefore, no impact to these species is anticipated.

The Navy has determined that there are three federally listed special status species that may be affected by the Proposed Action: the federally endangered light-footed Ridgway's rail (Rallus obsoletus levipes [LFRR]), the federally threatened Western snowy plover (Charadrius nivosus nivosus [WSPL]), and the federally endangered California least tern (Sterna antillarum ssp. Browni [CLTE]). Accordingly, the Navy submitted a Biological Assessment to the U.S. Fish and Wildlife Service (October 2020), and consultation is proceeding under Section 7 of the federal Endangered Species Act.

Light-Footed Ridgway's Rail. LFRR is a year-round resident bird at NBVC Point Mugu. LFRR commence breeding activity around mid-February with the establishment of mating pairs. Nesting occurs from mid-March to July with most eggs laid between April and May. Dispersal of

the young occurs in mid to late-July. LFRR are considered cursorial (ground dwelling) and are rarely observed in flight.

During construction of the L Avenue site, there is a potential for temporary, indirect effects to the LFRR from construction noise, vibration (from use of heavy equipment), and visual disturbances (e.g., increased presence of personnel), which may displace non-breeding LFRR in the immediate area. No construction would take place at Nike Zeus or Alpha Pads. As proposed in the conservation measures presented in Table 1, construction of the L Avenue LATS would be scheduled to avoid the LFRR breeding season from 1 March to 1 September.

Due to the very low abundance of LFRRs within the action area, their ground-dwelling behavior combined with the low tempo of laser operations (i.e., less than 34 cumulative hours of High Energy Laser and Lower Power Laser use within a year) and relatively small hazard area, the likelihood of an LFRR being affected by laser operations is so low as to be discountable. Avoidance and minimization measures in Table 1, section 3.2 also include a qualified biologist or trained personnel to walk the laser path if a bird-laser interaction is observed or suspected and annual findings involving federally listed species will be reported back to U.S. Fish and Wildlife Service as part of the installation's regular species surveys. In addition, as LFRR regularly remain under cover and do not flush readily from nests, disturbance from visible lasers overhead or nearby is also unlikely.

Western Snowy Plover. Although WSPL migrate, they are found year-round at Point Mugu. Most of the sandy beaches and salt pannes including Holiday Beach and Holiday Salt Panne in and near the action area are utilized for foraging, nesting, and resting by WSPL. WSPL nest on sandy beaches and above-tidal flats adjacent to Mugu Lagoon from early March to mid-September. At NBVC Point Mugu, WSPL chicks are fully fledged by mid-September with the last of the season's nests hatching usually by late July to early August.

Although WSPL nests are often located within close proximity (e.g., 200 feet on average) to the proposed L Avenue LATS, construction would occur outside of the nesting season. Thus, there would be no impacts to nesting WSPL.

While WSPL are year-round residents at NBVC Point Mugu and would be present within the action area, the potential for exposure to laser operations is low for several reasons. Due to the behavior of WSPL at NBVC Point Mugu to habituate well to nearby activities, the limited nests in the action area, the low flight height of the WSPL, the low tempo of laser operations (i.e., less than 34 cumulative hours of High Energy Laser and Lower Power Laser use per year) and relatively small hazard area, the potential for adverse impacts to WSPL are very low. With implementation of the proposed conservation measures (Table 1), the potential for adverse impacts is so low as to be discountable.

California Least Tern. CLTE are migratory birds that mostly arrive in late May and depart NBVC Point Mugu by late July to early August with usually only a few individuals observed

into mid-August. CLTE establish nesting colonies on sandy soils with little vegetation along the ocean, lagoons, and bays. CLTE nest in open beach habitat adjacent to Mugu Lagoon. They forage in the shallow open waters of the lagoon and ocean waters just offshore. CLTE nests are shallow depressions lined with shells or other debris. Over the last five years, on average 46 percent of CLTE nests on NBVC have been on Holiday Beach and Holiday Salt Panne. CLTE nesting and foraging areas are protected and additional recovery programs, such as population and nesting monitoring and predator management, are conducted. The Navy conducted avian point count surveys from 4 February 2020 through 30 July 2020 to collect data on bird proximity to the proposed path of the laser, population density, and approximate flying height. Between 1 May 2020, (the first 2020 point count survey observation of a CLTE) and 30 July 2020, there were 1,106 CLTE observed in the point count stations. Most of the terns were observed flying along the coastline and not crossing the laser path (east to west lines from DESIL to the L Avenue LATS bisecting the avian point count stations). The survey results showed that the heaviest concentrations of terns were observed flying within point count Stations 1, 2, and 3 between the L Avenue LATS and the Nike Zeus Pad.

A temporary increase of construction related noise and vibration from heavy equipment would occur during construction of the L Avenue LATS. Since construction would occur outside of the nesting season, there would be no impacts from construction related activities, as CLTE are not present outside of the nesting season.

Due to the limited (seasonal) presence of CLTE at NBVC Point Mugu, the average distance of nests from the laser pathway (approximately 250 feet), combined with the low tempo of laser operations (i.e., less than 34 cumulative hours of High Energy Laser and Lower Power Laser use within a year), and relatively small hazard area, the likelihood of a CLTE being affected by laser operations is low but is not discountable. The Navy would continue to manage habitats according to the INRMP, which is designed to protect and benefit threatened and endangered species. The INRMP contains conservation objectives and strategies to ensure natural resources are managed in support of the mission and regulatory compliance.

Pursuant to Section 7 of the Endangered Species Act, the Navy has determined that: 1) construction and operations described above may affect, but are not likely to adversely affect LFRR; 2: operations may affect, but are not likely to adversely affect the WSPL; 3) construction would have no effect on WSPL and CLTE; and 4) operations may affect and are likely to adversely affect CLTE. The Navy proposes to implement the avoidance and minimization measures presented in Table 1 and to comply with any requirements imposed by the U. S. Fish and Wildlife Service during the Section 7 consultation as well as to continue to implement the management actions described in the NBVC Integrated Natural Resources Management Plan.

Vegetation. Construction would occur only at the L Avenue site. Additional localized disturbance would occur for utility trenching and drop arm installation (in previously disturbed road shoulders). Construction would result in the permanent loss of 0.11 acre (0.05 ha) of

Vancouverian Coastal Dune and Bluff habitat. Another 0.60 acre (0.01 ha) would be temporarily impacted from vehicles, laydown and other construction related activities (Figure 4). The L Avenue site is located across the street from sandy dune habitat regularly used by the WSPL and CLTE. The L Avenue site is also located adjacent to saltmarsh habitat for the LFRR. No grading, construction, or vegetation removal is proposed at the Alpha or Nike Zeus Pads.

During laser operations, there is a slight potential for targets to smoke and catch fire. Although there is vegetation, including dune and salt marsh habitat, adjacent to the L Avenue LATS, habitat is not likely to be impacted during operations due to the low fire potential and implementation of safety protocols (see Table 1). Vegetation is further not likely to be impacted at the Alpha and Nike Zeus Pads because they are developed with asphalt with no vegetation.

Section 30244 – Archeological or paleontological resources: Where development would adversely impact archeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.

The proposed land-based L Avenue LATS has been previously disturbed and was previously partially covered with modern fill. The placement of new drop arm gates would require minimal excavation of previously disturbed areas. The proposed ground disturbance would be contained within the modern fill placed on top of native soils; therefore, the likelihood of encountering archaeological resources is minimal. No built environment resources that are considered historic properties, per the National Historic Preservation Act, occur within the project area. In addition, the proposed use of Nike Zeus and Alpha Pads are existing sites where CONEX boxes would be placed temporarily and would not involve ground disturbance. The Proposed Action is outside the areas identified as sensitive for cultural resources. Therefore, the Proposed Action has low to no probability of impacting sensitive cultural resources.

NBVC signed a Programmatic Agreement in 2015 with the California State Historic Preservation Office regarding Navy undertakings within Ventura County; the proposed L Avenue LATS is a project covered under this Programmatic Agreement. The NBVC Cultural Resource Program Manager reviewed the Proposed Action and determined that it can be approved with a finding of "No Historic Properties Affected" consistent with Stipulation 8A of the 2015 NBVC Programmatic Agreement and 36 CFR 800.4(d)(1). The Proposed Action would be reported to the California State Historic Preservation Office as part of NBVC's annual reporting, per the 2015 Programmatic Agreement.

Therefore, with implementation of the avoidance and minimization measures (see Table 1) and BMPs, there would be no effect to land resources of the coastal zone.

Article 6 – Development (CRPMP Sections 30250 *et seq.*)

Section 30251 – Scenic and visual qualities: The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development

shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and where feasible, to restore and enhance visual quality in visually degraded areas. New development in highly scenic areas such as those designated in the California Coastline Preservation and Recreation Plan prepared by the Department of Parks and Recreation and by local government shall be subordinate to the character of its setting.

Scenic and Visual Quality. Due to the restricted access of the project area inside an active military installation, the proposed LATS would not be subject to close-proximity public viewing nor would the project block or hinder public views of coastal resources.

The Proposed Action would construct a new, 400 to 500 square feet permanent one story, 15 to 18 feet high LATS building on the northeastern corner of L Avenue immediately east of a large revetment (retaining wall of boulders) adjacent to the Pacific Ocean. The introduction of one building would be visually compatible with the military-related infrastructure and the viewshed already present in the existing visual environment within the context of the immediate setting and NBVC Point Mugu as a whole. The design of the proposed LATS building would also be consistent with the Installation Appearance Standards contained in the 2017 NBVC Installation Development Plan as well as existing buildings in terms of building form, scale, style, architectural treatments, materials, and colors. The proposed drop arms would be visually consistent with existing drop arms on the Base. The proposed temporary placement of CONEX boxes on Nike Zeus and Alpha Pads would be visually consistent with current activities at the pads which have existing buildings. Overall, the visual and scenic quality would not appear to have substantially changed once construction is complete.

Section 30253 – Minimization of adverse impacts: New development shall do all of the following: (a) Minimize risks to life and property in areas of high geologic, flood, and fire hazard. (b) Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs. (c) Be consistent with requirements imposed by an air pollution control district or the State Air Resources Control Board as to each particular development. (d) Minimize energy consumption and vehicle miles traveled. (e) Where appropriate, protect special communities and neighborhoods that, because of their unique characteristics, are popular visitor destination points for recreational uses.

Minimization of Adverse Impacts. Demolition and construction activities would not result in adverse impacts to geological resources. The majority of the proposed activities would occur within previously developed areas of the Base. The project area is located in a seismically active region, as is most of Southern California. Seismic hazards can include landslides, ground shaking, surface displacement, and rupture, liquefaction, and tsunamis. Construction would incorporate industry standard seismic engineering measures.

Sea Level Rise. The project area does not encompass shoreline and all construction activities would occur away from the shoreline. Upgrades as part of the NBVC Point Mugu Shoreline Protection Repair and Enhancements project, a separate and unconnected action, would provide increased protection against sea level rise and coastal flooding at the proposed L Avenue LATS. For example, Beach Road, parallel to the proposed L Avenue LATS building has been recontoured north of the L Avenue site. The L Avenue site was not listed as a vulnerable area per the Shoreline Protection Repair and Enhancements project. The proposed L Avenue site is protected by a broader beach and more stable dunes. While nearby M Avenue and Building PM-812 were identified as vulnerable areas as part of the Shoreline Protection project, the proposed L Avenue LATS is located 1,914 feet from Building PM-812 and has no history of flooding. In addition, the beach along the L Avenue site is wider (240 feet) compared to the M Avenue site (63 feet) and the L Avenue site has vegetated and more stable dunes compared to the more vulnerable M Avenue area. Furthermore, to minimize risk from potential future sea level rise, the proposed L Avenue site may be elevated one to three feet depending on an engineering analysis in order to provide additional protection. The Navy has determined that the Proposed Action would not affect the shoreline.

Air Quality. The Proposed Action would follow applicable Ventura County Air Pollution Control District policies. As described in the Navy's Record of Non-Applicability (prepared as part of the Navy's EA), emissions from the proposed construction and operation activities would not exceed the de minimis thresholds identified for the South Central Coast Air Basin. Therefore, the Proposed Action would conform to the South Central Coast Air Basin State Implementation Plan and would not trigger a conformity determination under the Clean Air Act, as amended.

Section 30255 – Priority of coastal-dependent developments: Coastal-dependent developments shall have priority over other developments on or near the shoreline. Except as provided elsewhere in this division, coastal-dependent developments shall not be sited in a wetland. When appropriate, coastal-related developments should be accommodated within reasonable proximity to the coastal-dependent uses they support.

Coastal-Dependent Development. The Navy's mission "is to maintain, train and equip combat ready Naval forces capable of winning wars, deterring aggression and maintaining freedom of the seas." Having installations on the coast, near the seas where their primary mission takes them, is vitally important to the Navy and thus can be considered a coastal-dependent use with priority in development. The Proposed Action is needed to further the Navy's DE Test Program with land-based laser target sites in an operationally relevant maritime environment, and ultimately support Fleet readiness as part of the Navy's overall mission to maintain, train, and equip combat-ready Naval forces.

Therefore, there would be no effect to the scenic, visual, geologic, shoreline, or air quality of the coastal zone.

CONCLUSION

In accordance with the Federal Coastal Zone Management Act of 1972, as amended, Section 307(c)(1), the Coastal Consistency Negative Determination demonstrates that the Proposed Action would be undertaken in a manner that would avoid or minimize effects on coastal uses or resources. The Navy respectfully requests your concurrence. If you need additional information or if you have any questions, please do not hesitate to contact Ms. Deb McKay at (619) 705-5403 or via email at deborah.mckay@navy.mil.

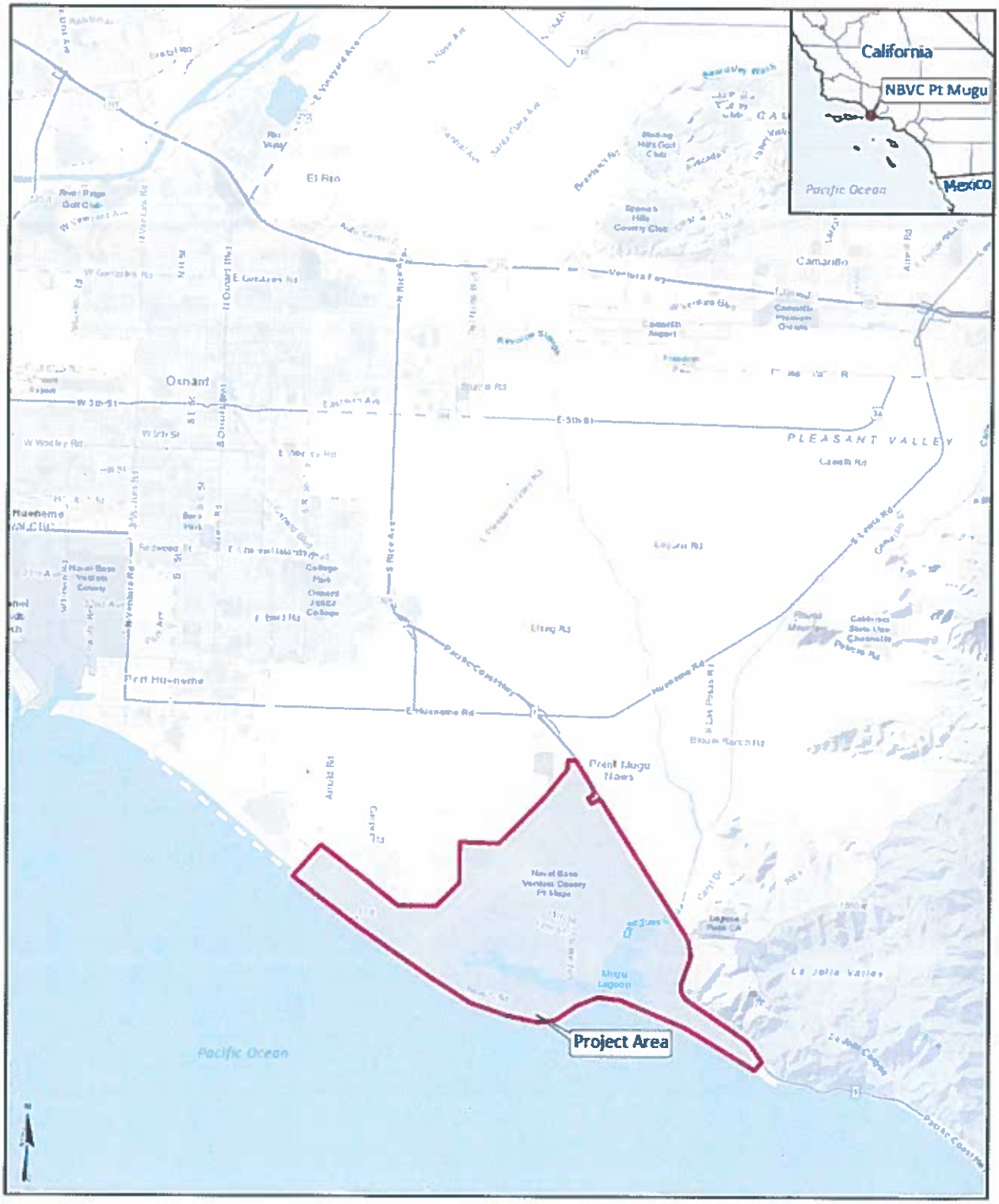


Figure 1 Location Map

Appendix B
Record of Non-Applicability (RONA) and Air Quality Emissions Calculations

RECORD OF NON-APPLICABILITY (RONA) FOR CLEAN AIR ACT CONFORMITY

ENVIRONMENTAL ASSESSMENT FOR DIRECTED ENERGY SYSTEMS INTEGRATION LABORATORY (DESIL) LAND-BASED LASER TARGET SITES

NAVAL BASE VENTURA COUNTY, POINT MUGU, CA

VENTURA COUNTY, LOS ANGELES AIR BASIN

INTRODUCTION

The U.S. Environmental Protection Agency (USEPA) published *Determining Conformity of General Federal Actions to State or Federal Implementation Plans; Final Rule* in the 30 November 1993, Federal Register (40 Code of Federal Regulations [CFR] Parts 6, 51, and 93). The U.S. Department of the Navy (Navy) published *Clean Air Act (CAA) General Conformity Guidance* in the Office of the Chief of Naval Operations Instruction (OPNAVINST) 5090.1E, dated 3 September 2019 and the Navy guidance for compliance with the CAA General Conformity Rule, dated 30 July 2013. These publications provide implementing guidance to document CAA Conformity Determination requirements.

Federal regulations state that no department, agency, or instrumentality of the Federal Government shall engage in, support in any way or provide financial assistance for, license to permit, or approve any activity that does not conform to an applicable implementation plan. It is the responsibility of the Federal agency to determine whether a Federal action conforms to the applicable implementation plan, before the action is taken (40 CFR Part 1, Section 51.850[a]).

The General Conformity rule applies to federal actions proposed within areas which are designated as either nonattainment or maintenance areas for a National Ambient Air Quality Standard (NAAQS) for any of the criteria pollutants. Former nonattainment areas that have attained a NAAQS are designated as maintenance areas. Emissions of pollutants for which an area is in attainment are exempt from conformity analyses.

The project would occur at Naval Base Ventura County Point Mugu in Ventura County, part of Metropolitan Los Angeles Air Quality Control Region. Ventura County is "serious" nonattainment for the 2008 eight-hour ozone NAAQS and "serious" nonattainment for the 2015 eight-hour ozone NAAQS. Ventura County is classified as unclassified/attainment for all other criteria pollutants NAAQS. Therefore, only project emissions O_3 (precursors, volatile organic compounds [VOCs] and oxides of nitrogen [NOx]) are analyzed for conformity rule applicability.

The annual *de minimis* levels for this region are 50 tons of VOC, and NOx, as listed in Table 1. Federal actions may be exempt from conformity determinations if they do not exceed designated *de minimis* levels (40 CFR Part 1, Section 51.853[b]) and are not regionally significant (totals less than 10 percent of projected regional emissions for that pollutant) (40 CFR Part 1, Section 93.153[b]).

Table 1. Conformity *de minimum* Levels for Criteria Pollutants in Ventura County

Criteria Pollutant	*de minimis* Level (tons/year)
Volatile Organic Compounds (VOC)	50
Oxides of Nitrogen (NO_x)	50

PROPOSED ACTION

Action Proponent: U.S. Navy

Location: Naval Base Ventura County.

Proposed Action Name: Directed Energy Systems Integration Laboratory (DESIL) Land-Based Laser Target Sites at Naval Base Ventura County Point Mugu, CA.

Proposed Action & Emissions Summary: The Proposed Action would involve the construction and operation of land-based laser target sites up to two kilometers from the Directed Energy Systems Integration Laboratory at Naval Base Ventura County, Point Mugu, CA. The land-based laser targets would be engaged from directed energy laser systems at Directed Energy Systems Integration Laboratory for the purposes of alignment, calibration, and testing of the lasers.

Project Emissions:

Construction work would occur during 2021 and be completed within a one-year period. Operations emissions would begin in late 2021 or 2022.

Table 2 and 3 present the estimated construction emissions due to implementation of the Proposed Action. Maximum estimated emissions would be below conformity *de minimis* levels.

Table 2. Estimated Annual Emissions Resulting from Implementation of the Proposed Action - Construction

	NOx (tpy)	VOC (tpy)
2021 Construction Emissions	0.43	0.05
General Conformity *de minimis* Threshold	50*	50*
Exceed *de minimis*?	No	No
Tpy = Tons per Year *Threshold for area in serious nonattainment. **General Conformity *de minimis* thresholds are only provided for nonattainment of Federal NAAQS		

Table 3. Estimated Emissions Resulting from Implementation of the Proposed Action - Operations

	NOx (tpy)	*VOC (tpy)*
Operational Emissions (Annual)	0.66	0.09
General Conformity *de minimis* Threshold	50*	50*
Exceed *de minimis*?	No	No
Tpy = Tons per Year *Threshold for area in serious nonattainment. **General Conformity *de minimis* thresholds are only provided for nonattainment of Federal NAAQS		

Date RONA Prepared: 6 JULY 2020

PROPOSED ACTION EXEMPTION(S)

The Proposed Action is located within a nonattainment and maintenance area; therefore, the Proposed Action is **not** exempt from General Conformity Rule Requirements.

ATTAINMENT AREA STATUS AND EMISSIONS EVALUATION CONCLUSION

Ventura County is a serious nonattainment area for the 8-hour federal O_3 standard; VOCs and NO_x are precursors to the formation of O_3.

Emissions associated with the Preferred Alternative were calculated using data presented in Chapter 2 of the EA, general air quality assumptions, and emission factors compiled from the following sources: California Air Pollution Officers California Emissions Model (CalEEMod) 2016.3.2. The U.S. Navy concludes that *de minimis* thresholds for applicable criteria pollutants would not be exceeded nor would the project be regionally significant (i.e., greater than 10 percent of the air basins' emission budgets) as a result of implementation of the Proposed Action. Therefore, the Navy concludes that further Conformity Determination procedures are not required, resulting in this Record of Non-Applicability.

RONA APPROVAL

To the best of my knowledge, the information presented in this RONA is correct and accurate, and I concur in the finding that implementation of the Proposed Action does not require a formal CAA Conformity Determination.

Date: 4/23/21

Signature: Daniel T. Shide

Daniel T. Shide
Installation Environmental Program Director

Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards [1]		National Standards [2]		
		Concentration [3]	Method [4]	Primary [3,5]	Secondary [3,6]	Method [7]
Ozone (O_3)[8]	1 Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m^3)		0.070 ppm (137 µg/m^3)		
Respirable Particulate Matter (PM10)[9]	24 Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		—		
Fine Particulate Matter (PM2.5)[9]	24 Hour	—	—	35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	12.0 µg/m^3	15 µg/m^3	
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	35 ppm (40 mg/m^3)	—	Non-Dispersive Infrared Photometry (NDIR)
	8 Hour	9.0 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)	—	
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		—	—	
Nitrogen Dioxide (NO_2)[10]	1 Hour	0.18 ppm (339 µg/m^3)	Gas Phase Chemiluminescence	100 ppb (188 µg/m^3)	—	Gas Phase Chemiluminescence
	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)		0.053 ppm (100 µg/m^3)	Same as Primary Standard	
Sulfur Dioxide (SO_2)[11]	1 Hour	0.25 ppm (655 µg/m^3)	Ultraviolet Fluorescence	75 ppb (196 µg/m^3)	—	Ultraviolet Flourescence; Spectrophotometry (Pararosaniline Method)
	3 Hour	—		—	0.5 ppm (1300 µg/m^3)	
	24 Hour	0.04 ppm (105 µg/m^3)		0.14 ppm (for certain areas)[11]	—	
	Annual Arithmetic Mean	—		0.030 ppm (for certain areas)[11]	—	
Lead[12,13]	30 Day Average	1.5 µg/m^3	Atomic Absorption	—	—	High Volume Sampler and Atomic Absorption
	Calendar Quarter	—		1.5 µg/m^3 (for certain areas)[12]	Same as Primary Standard	
	Rolling 3-Month Average	—		0.15 µg/m^3		
Visibility Reducing Particles[14]	8 Hour	See footnote 14	Beta Attenuation and Transmittance through Filter Tape	**No National Standards**		
Sulfates	24 Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[12]	24 Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

See footnotes on next page …

1. California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM10, PM2.5, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

2. National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For PM2.5, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the U.S. EPA for further clarification and current national policies.

3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

4. Any equivalent measurement method which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.

5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

7. Reference method as described by the U.S. EPA. An “equivalent method” of measurement may be used but must have a “consistent relationship to the reference method” and must be approved by the U.S. EPA.

8. On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.

9. On December 14, 2012, the national annual PM2.5 primary standard was lowered from 15 $\mu g/m^3$ to 12.0 $\mu g/m^3$. The existing national 24-hour PM2.5 standards (primary and secondary) were retained at 35 $\mu g/m^3$, as was the annual secondary standard of 15 $\mu g/m^3$. The existing 24-hour PM10 standards (primary and secondary) of 150 $\mu g/m^3$ also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

10. To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.

11. On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

    Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

12. The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

13. The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 $\mu g/m^3$ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

14. In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

NBVC DESIL Land Based Targets Alternative 1

Ventura County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Research & Development	0.50	1000sqft	0.20	500.00	0
Parking Lot	0.00		0.30	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	31
Climate Zone	8			**Operational Year**	2022
Utility Company					
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Population and site acreage based on Requirements Document for MILCON P777 Land-Based Target Site, 15 April 2020 published by Directed Energy Systems Integration Laboratory.

Construction Phase - No existing buildings or site features to demolish.

Operational Off-Road Equipment - 20 KVA generator, used in Prime Mode, is about 30 horsepower. Estimated 2 generators in use for conservative approach and to capture mobile chiller.

Vehicle Trips - Facility operates 4 days per week for 52 weeks per year.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	0.00

NBVC DESIL Land Based Targets Alternative 1 - Ventura County, Annual

tblConstructionPhase	PhaseEndDate	9/22/2021	9/8/2021
tblConstructionPhase	PhaseEndDate	9/8/2021	8/25/2021
tblConstructionPhase	PhaseEndDate	4/16/2021	4/4/2021
tblConstructionPhase	PhaseEndDate	4/21/2021	4/7/2021
tblConstructionPhase	PhaseEndDate	9/15/2021	9/1/2021
tblConstructionPhase	PhaseEndDate	4/19/2021	4/5/2021
tblConstructionPhase	PhaseStartDate	9/16/2021	9/2/2021
tblConstructionPhase	PhaseStartDate	4/22/2021	4/8/2021
tblConstructionPhase	PhaseStartDate	4/20/2021	4/6/2021
tblConstructionPhase	PhaseStartDate	9/9/2021	8/26/2021
tblConstructionPhase	PhaseStartDate	4/17/2021	4/5/2021
tblLandUse	LotAcreage	0.01	0.20
tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	208.00
tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	208.00
tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	208.00
tblOperationalOffRoadEquipment	OperHorsePower	84.00	30.00
tblOperationalOffRoadEquipment	OperHoursPerDay	8.00	10.00
tblOperationalOffRoadEquipment	OperHoursPerDay	8.00	4.00
tblOperationalOffRoadEquipment	OperHoursPerDay	8.00	4.00
tblOperationalOffRoadEquipment	OperLoadFactor	0.20	0.20
tblOperationalOffRoadEquipment	OperLoadFactor	0.29	0.29
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	2.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	1.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	1.00
tblVehicleTrips	ST_TR	1.90	0.00
tblVehicleTrips	SU_TR	1.11	0.00
tblVehicleTrips	WD_TR	8.11	8.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0486	0.4312	0.3965	6.3000e-004	1.4800e-003	0.0241	0.0255	5.7000e-004	0.0222	0.0227	0.0000	54.8812	54.8812	0.0173	0.0000	55.3126
Maximum	**0.0486**	**0.4312**	**0.3965**	**6.3000e-004**	**1.4800e-003**	**0.0241**	**0.0255**	**5.7000e-004**	**0.0222**	**0.0227**	**0.0000**	**54.8812**	**54.8812**	**0.0173**	**0.0000**	**55.3126**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0486	0.4312	0.3965	6.3000e-004	1.4800e-003	0.0241	0.0255	5.7000e-004	0.0222	0.0227	0.0000	54.8812	54.8812	0.0173	0.0000	55.3125
Maximum	**0.0486**	**0.4312**	**0.3965**	**6.3000e-004**	**1.4800e-003**	**0.0241**	**0.0255**	**5.7000e-004**	**0.0222**	**0.0227**	**0.0000**	**54.8812**	**54.8812**	**0.0173**	**0.0000**	**55.3125**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	4-5-2021	7-4-2021	0.2841	0.2841
2	7-5-2021	9-30-2021	0.1921	0.1921
		Highest	0.2841	0.2841

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	2.5300e-003	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-005	1.0000e-005	0.0000	0.0000	1.0000e-005
Energy	6.0000e-005	5.1000e-004	4.3000e-004	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.5577	0.5577	1.0000e-005	1.0000e-005	0.5610
Mobile	6.8000e-004	2.8200e-003	8.3000e-003	3.0000e-005	2.7100e-003	2.0000e-005	2.7300e-003	7.2000e-004	2.0000e-005	7.5000e-004	0.0000	2.6556	2.6556	1.1000e-004	0.0000	2.6584
Offroad	0.0822	0.6577	0.5508	1.0900e-003		0.0272	0.0272		0.0262	0.0262	0.0000	85.6909	85.6909	0.0154	0.0000	86.0749
Waste						0.0000	0.0000		0.0000	0.0000	8.1200e-003	0.0000	8.1200e-003	4.8000e-004	0.0000	0.0201
Water						0.0000	0.0000		0.0000	0.0000	0.0780	0.0000	0.0780	8.0100e-003	1.9000e-004	0.3346
Total	**0.0855**	**0.6611**	**0.5595**	**1.1200e-003**	**2.7100e-003**	**0.0272**	**0.0300**	**7.2000e-004**	**0.0262**	**0.0270**	**0.0861**	**88.9042**	**88.9903**	**0.0240**	**2.0000e-004**	**89.6490**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	2.5300e-003	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-005	1.0000e-005	0.0000	0.0000	1.0000e-005
Energy	6.0000e-005	5.1000e-004	4.3000e-004	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.5577	0.5577	1.0000e-005	1.0000e-005	0.5610
Mobile	6.8000e-004	2.8200e-003	8.3000e-003	3.0000e-005	2.7100e-003	2.0000e-005	2.7300e-003	7.2000e-004	2.0000e-005	7.5000e-004	0.0000	2.6556	2.6556	1.1000e-004	0.0000	2.6584
Offroad	0.0822	0.6577	0.5508	1.0900e-003		0.0272	0.0272		0.0262	0.0262	0.0000	85.6909	85.6909	0.0154	0.0000	86.0749
Waste						0.0000	0.0000		0.0000	0.0000	8.1200e-003	0.0000	8.1200e-003	4.8000e-004	0.0000	0.0201
Water						0.0000	0.0000		0.0000	0.0000	0.0780	0.0000	0.0780	8.0100e-003	1.9000e-004	0.3346
Total	**0.0855**	**0.6611**	**0.5595**	**1.1200e-003**	**2.7100e-003**	**0.0272**	**0.0300**	**7.2000e-004**	**0.0262**	**0.0270**	**0.0861**	**88.9042**	**88.9903**	**0.0240**	**2.0000e-004**	**89.6490**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

NBVC DESIL Land Based Targets Alternative 1 - Ventura County, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	4/5/2021	4/4/2021	5	0	No demolition required
2	Site Preparation	Site Preparation	4/5/2021	4/5/2021	5	1	
3	Grading	Grading	4/6/2021	4/7/2021	5	2	
4	Building Construction	Building Construction	4/8/2021	8/25/2021	5	100	
5	Paving	Paving	8/26/2021	9/1/2021	5	5	
6	Architectural Coating	Architectural Coating	9/2/2021	9/8/2021	5	5	

Acres of Grading (Site Preparation Phase): 0.5

Acres of Grading (Grading Phase): 0

Acres of Paving: 0.3

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 750; Non-Residential Outdoor: 250; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

NBVC DESIL Land Based Targets Alternative 1 - Ventura County, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Cranes	1	4.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Site Preparation	Graders	1	8.00	187	0.41
Paving	Pavers	1	7.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Demolition	Rubber Tired Dozers	1	1.00	247	0.40
Grading	Rubber Tired Dozers	1	1.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	4	10.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	2	5.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Demolition - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Demolition - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.3 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.7000e-004	0.0000	2.7000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.2000e-004	3.9100e-003	2.0100e-003	0.0000		1.5000e-004	1.5000e-004		1.4000e-004	1.4000e-004	0.0000	0.4276	0.4276	1.4000e-004	0.0000	0.4310
Total	**3.2000e-004**	**3.9100e-003**	**2.0100e-003**	**0.0000**	**2.7000e-004**	**1.5000e-004**	**4.2000e-004**	**3.0000e-005**	**1.4000e-004**	**1.7000e-004**	**0.0000**	**0.4276**	**0.4276**	**1.4000e-004**	**0.0000**	**0.4310**

3.3 Site Preparation - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-005	1.0000e-005	6.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0168	0.0168	0.0000	0.0000	0.0168
Total	**1.0000e-005**	**1.0000e-005**	**6.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0168**	**0.0168**	**0.0000**	**0.0000**	**0.0168**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.7000e-004	0.0000	2.7000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.2000e-004	3.9100e-003	2.0100e-003	0.0000		1.5000e-004	1.5000e-004		1.4000e-004	1.4000e-004	0.0000	0.4276	0.4276	1.4000e-004	0.0000	0.4310
Total	**3.2000e-004**	**3.9100e-003**	**2.0100e-003**	**0.0000**	**2.7000e-004**	**1.5000e-004**	**4.2000e-004**	**3.0000e-005**	**1.4000e-004**	**1.7000e-004**	**0.0000**	**0.4276**	**0.4276**	**1.4000e-004**	**0.0000**	**0.4310**

3.3 Site Preparation - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-005	1.0000e-005	6.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0168	0.0168	0.0000	0.0000	0.0168
Total	**1.0000e-005**	**1.0000e-005**	**6.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0168**	**0.0168**	**0.0000**	**0.0000**	**0.0168**

3.4 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.5000e-004	0.0000	7.5000e-004	4.1000e-004	0.0000	4.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.0000e-004	7.2500e-003	7.5700e-003	1.0000e-005		4.1000e-004	4.1000e-004		3.9000e-004	3.9000e-004	0.0000	1.0409	1.0409	1.9000e-004	0.0000	1.0458
Total	**8.0000e-004**	**7.2500e-003**	**7.5700e-003**	**1.0000e-005**	**7.5000e-004**	**4.1000e-004**	**1.1600e-003**	**4.1000e-004**	**3.9000e-004**	**8.0000e-004**	**0.0000**	**1.0409**	**1.0409**	**1.9000e-004**	**0.0000**	**1.0458**

3.4 Grading - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	2.0000e-005	2.5000e-004	0.0000	8.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0670	0.0670	0.0000	0.0000	0.0671
Total	**3.0000e-005**	**2.0000e-005**	**2.5000e-004**	**0.0000**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0670**	**0.0670**	**0.0000**	**0.0000**	**0.0671**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.5000e-004	0.0000	7.5000e-004	4.1000e-004	0.0000	4.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.0000e-004	7.2500e-003	7.5700e-003	1.0000e-005		4.1000e-004	4.1000e-004		3.9000e-004	3.9000e-004	0.0000	1.0409	1.0409	1.9000e-004	0.0000	1.0458
Total	**8.0000e-004**	**7.2500e-003**	**7.5700e-003**	**1.0000e-005**	**7.5000e-004**	**4.1000e-004**	**1.1600e-003**	**4.1000e-004**	**3.9000e-004**	**8.0000e-004**	**0.0000**	**1.0409**	**1.0409**	**1.9000e-004**	**0.0000**	**1.0458**

3.4 Grading - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	2.0000e-005	2.5000e-004	0.0000	8.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0670	0.0670	0.0000	0.0000	0.0671
Total	**3.0000e-005**	**2.0000e-005**	**2.5000e-004**	**0.0000**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0670**	**0.0670**	**0.0000**	**0.0000**	**0.0671**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0388	0.3993	0.3632	5.7000e-004		0.0224	0.0224		0.0206	0.0206	0.0000	50.0410	50.0410	0.0162	0.0000	50.4456
Total	**0.0388**	**0.3993**	**0.3632**	**5.7000e-004**		**0.0224**	**0.0224**		**0.0206**	**0.0206**	**0.0000**	**50.0410**	**50.0410**	**0.0162**	**0.0000**	**50.4456**

3.5 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0388	0.3993	0.3632	5.7000e-004		0.0224	0.0224		0.0206	0.0206	0.0000	50.0410	50.0410	0.0162	0.0000	50.4456
Total	**0.0388**	**0.3993**	**0.3632**	**5.7000e-004**		**0.0224**	**0.0224**		**0.0206**	**0.0206**	**0.0000**	**50.0410**	**50.0410**	**0.0162**	**0.0000**	**50.4456**

3.5 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.6 Paving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.8000e-003	0.0168	0.0177	3.0000e-005		8.8000e-004	8.8000e-004		8.2000e-004	8.2000e-004	0.0000	2.3481	2.3481	6.8000e-004	0.0000	2.3652
Paving	3.9000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.1900e-003**	**0.0168**	**0.0177**	**3.0000e-005**		**8.8000e-004**	**8.8000e-004**		**8.2000e-004**	**8.2000e-004**	**0.0000**	**2.3481**	**2.3481**	**6.8000e-004**	**0.0000**	**2.3652**

3.6 Paving - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6000e-004	1.0000e-004	1.1100e-003	0.0000	3.6000e-004	0.0000	3.7000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3015	0.3015	1.0000e-005	0.0000	0.3017
Total	**1.6000e-004**	**1.0000e-004**	**1.1100e-003**	**0.0000**	**3.6000e-004**	**0.0000**	**3.7000e-004**	**1.0000e-004**	**0.0000**	**1.0000e-004**	**0.0000**	**0.3015**	**0.3015**	**1.0000e-005**	**0.0000**	**0.3017**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.8000e-003	0.0168	0.0177	3.0000e-005		8.8000e-004	8.8000e-004		8.2000e-004	8.2000e-004	0.0000	2.3481	2.3481	6.8000e-004	0.0000	2.3652
Paving	3.9000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.1900e-003**	**0.0168**	**0.0177**	**3.0000e-005**		**8.8000e-004**	**8.8000e-004**		**8.2000e-004**	**8.2000e-004**	**0.0000**	**2.3481**	**2.3481**	**6.8000e-004**	**0.0000**	**2.3652**

3.6 Paving - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6000e-004	1.0000e-004	1.1100e-003	0.0000	3.6000e-004	0.0000	3.7000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3015	0.3015	1.0000e-005	0.0000	0.3017
Total	**1.6000e-004**	**1.0000e-004**	**1.1100e-003**	**0.0000**	**3.6000e-004**	**0.0000**	**3.7000e-004**	**1.0000e-004**	**0.0000**	**1.0000e-004**	**0.0000**	**0.3015**	**0.3015**	**1.0000e-005**	**0.0000**	**0.3017**

3.7 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	5.7900e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.5000e-004	3.8200e-003	4.5400e-003	1.0000e-005		2.4000e-004	2.4000e-004		2.4000e-004	2.4000e-004	0.0000	0.6383	0.6383	4.0000e-005	0.0000	0.6394
Total	**6.3400e-003**	**3.8200e-003**	**4.5400e-003**	**1.0000e-005**		**2.4000e-004**	**2.4000e-004**		**2.4000e-004**	**2.4000e-004**	**0.0000**	**0.6383**	**0.6383**	**4.0000e-005**	**0.0000**	**0.6394**

3.7 Architectural Coating - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	5.7900e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.5000e-004	3.8200e-003	4.5400e-003	1.0000e-005		2.4000e-004	2.4000e-004		2.4000e-004	2.4000e-004	0.0000	0.6383	0.6383	4.0000e-005	0.0000	0.6394
Total	**6.3400e-003**	**3.8200e-003**	**4.5400e-003**	**1.0000e-005**		**2.4000e-004**	**2.4000e-004**		**2.4000e-004**	**2.4000e-004**	**0.0000**	**0.6383**	**0.6383**	**4.0000e-005**	**0.0000**	**0.6394**

3.7 Architectural Coating - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	6.8000e-004	2.8200e-003	8.3000e-003	3.0000e-005	2.7100e-003	2.0000e-005	2.7300e-003	7.2000e-004	2.0000e-005	7.5000e-004	0.0000	2.6556	2.6556	1.1000e-004	0.0000	2.6584
Unmitigated	6.8000e-004	2.8200e-003	8.3000e-003	3.0000e-005	2.7100e-003	2.0000e-005	2.7300e-003	7.2000e-004	2.0000e-005	7.5000e-004	0.0000	2.6556	2.6556	1.1000e-004	0.0000	2.6584

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Research & Development	4.00	0.00	0.00	7,161	7,161
Total	4.00	0.00	0.00	7,161	7,161

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Research & Development	9.50	7.30	7.30	33.00	48.00	19.00	82	15	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Parking Lot	0.588665	0.041515	0.188382	0.110464	0.019030	0.006351	0.019720	0.017925	0.001164	0.001012	0.003904	0.000380	0.001490
Research & Development	0.588665	0.041515	0.188382	0.110464	0.019030	0.006351	0.019720	0.017925	0.001164	0.001012	0.003904	0.000380	0.001490

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	6.0000e-005	5.1000e-004	4.3000e-004	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.5577	0.5577	1.0000e-005	1.0000e-005	0.5610
NaturalGas Unmitigated	6.0000e-005	5.1000e-004	4.3000e-004	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.5577	0.5577	1.0000e-005	1.0000e-005	0.5610

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Research & Development	10450	6.0000e-005	5.1000e-004	4.3000e-004	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.5577	0.5577	1.0000e-005	1.0000e-005	0.5610
Total		**6.0000e-005**	**5.1000e-004**	**4.3000e-004**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**	**0.0000**	**0.5577**	**0.5577**	**1.0000e-005**	**1.0000e-005**	**0.5610**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Research & Development	10450	6.0000e-005	5.1000e-004	4.3000e-004	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.5577	0.5577	1.0000e-005	1.0000e-005	0.5610
Total		**6.0000e-005**	**5.1000e-004**	**4.3000e-004**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**	**0.0000**	**0.5577**	**0.5577**	**1.0000e-005**	**1.0000e-005**	**0.5610**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Research & Development	4225	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Research & Development	4225	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	2.5300e-003	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-005	1.0000e-005	0.0000	0.0000	1.0000e-005
Unmitigated	2.5300e-003	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-005	1.0000e-005	0.0000	0.0000	1.0000e-005

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	5.8000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.9500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-005	1.0000e-005	0.0000	0.0000	1.0000e-005
Total	**2.5300e-003**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**0.0000**	**1.0000e-005**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	5.8000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.9500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-005	1.0000e-005	0.0000	0.0000	1.0000e-005
Total	**2.5300e-003**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**0.0000**	**1.0000e-005**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0780	8.0100e-003	1.9000e-004	0.3346
Unmitigated	0.0780	8.0100e-003	1.9000e-004	0.3346

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Research & Development	0.245847 / 0	0.0780	8.0100e-003	1.9000e-004	0.3346
Total		**0.0780**	**8.0100e-003**	**1.9000e-004**	**0.3346**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Research & Development	0.245847 / 0	0.0780	8.0100e-003	1.9000e-004	0.3346
Total		**0.0780**	**8.0100e-003**	**1.9000e-004**	**0.3346**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	8.1200e-003	4.8000e-004	0.0000	0.0201
Unmitigated	8.1200e-003	4.8000e-004	0.0000	0.0201

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Research & Development	0.04	8.1200e-003	4.8000e-004	0.0000	0.0201
Total		**8.1200e-003**	**4.8000e-004**	**0.0000**	**0.0201**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Research & Development	0.04	8.1200e-003	4.8000e-004	0.0000	0.0201
Total		**8.1200e-003**	**4.8000e-004**	**0.0000**	**0.0201**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
Generator Sets	2	10.00	208	30	0.74	Diesel
Forklifts	1	4.00	208	89	0.20	Diesel
Cranes	1	4.00	208	231	0.29	Diesel

UnMitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Cranes	0.0193	0.2162	0.0978	3.0000e-004		8.9700e-003	8.9700e-003		8.2600e-003	8.2600e-003	0.0000	26.1893	26.1893	8.4700e-003	0.0000	26.4011
Forklifts	5.9400e-003	0.0551	0.0603	8.0000e-005		3.6500e-003	3.6500e-003		3.3600e-003	3.3600e-003	0.0000	7.0181	7.0181	2.2700e-003	0.0000	7.0748
Generator Sets	0.0570	0.3864	0.3928	7.1000e-004		0.0146	0.0146		0.0146	0.0146	0.0000	52.4836	52.4836	4.6200e-003	0.0000	52.5990
Total	**0.0822**	**0.6577**	**0.5508**	**1.0900e-003**		**0.0272**	**0.0272**		**0.0262**	**0.0262**	**0.0000**	**85.6909**	**85.6909**	**0.0154**	**0.0000**	**86.0749**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Appendix C
Biological Resources Action Area and Bird Species Details

The following figures and tables provide additional detail, as referenced in Section 3.2, Biological Resources

- Figure C.1-a Action Area
- Figure C.1-b L Avenue LATS 500-Foot Construction Area
- Table C-1 Bird Species Identified During the Avian Point Count Surveys Conducted Between 4 February and 30 July 2020
- Figure C.2-a Light-footed Ridgway's Rail Observed at NBVC Point Mugu in 2019
- Figure C.2-b Western Snowy Plover Observed at NBVC Point Mugu in 2019
- Figure C.2-c California Least Terns Observed at NBVC Point Mugu in 2019
- Table C-2 California Least Terns Nests at Holiday Beach and Holiday Salt Panne, 2003-2020
- Table C-3 Bats Documented or with Potential to Occur at NBVC Point Mugu

Figure C.1-a Action Area

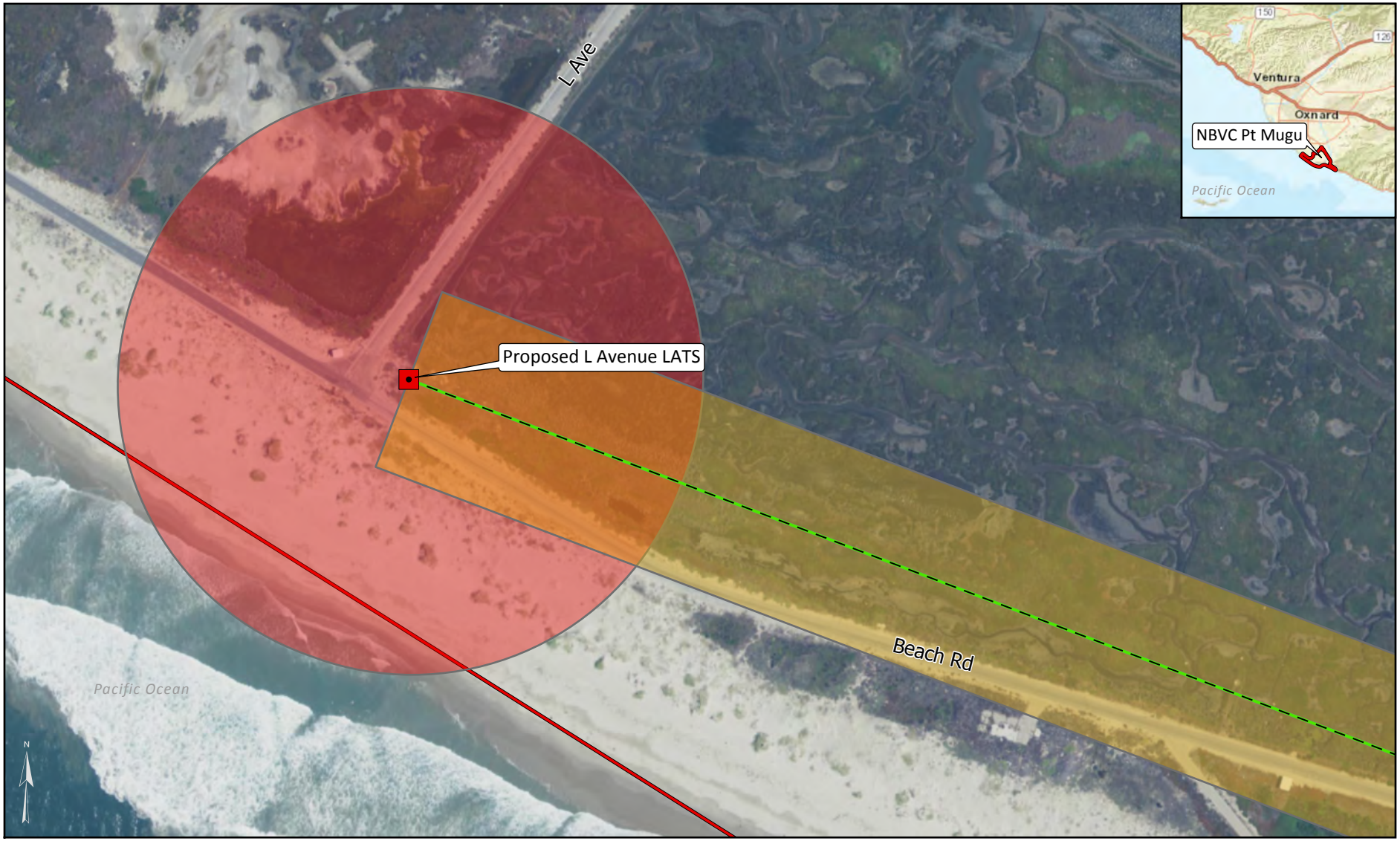


Figure C.1-b L Avenue LATS 500-Foot Construction Area

Table C-1 Bird Species Identified During the Avian Point Count Surveys Conducted Between 4 February and 30 July 2020

Common Name	Scientific Name	Federal Listing Status (ESA)	State Listing Status (CESA)	Other Conservation Listings
American Crow	*Corvus brachyrhynchos*	NL	NL	
American goldfinch	*Spinus tristis*	NL	NL	
American Kestrel	*Falco sparverius*	NL	NL	
American Pipit	*Anthus rubescens*	NL	NL	
Barn swallow	*Hirundo rustica*	NL	NL	
Belding's savannah sparrow	*Passerculus sandwichensis beldingi*	NL	SE	BCC SSC
Bewick's Wren	*Thryomanes bewickii*	NL	NL	
Black phoebe	*Sayornis nigricans*	NL	NL	
Brown-headed Cowbird	*Molothrus ater*	NL	NL	
Brown pelican	*Pelecanus occidentalis*	Delisted	Delisted	FP, SSC
Common loon	*Gavia immer*	NL	NL	SSC
Common yellowthroat	*Geothlypis trichas sinuosa*	NL	NL	BCC/SSC
California gull	*Larus californicus*	NL	NL	
California least tern	*Sterna antillarum ssp. browni*	FE	SE	FP
Caspian Tern	*Hydroprogne caspia*	NL	NL	BCC
Cliff Swallow	*Petrochelidon pyrrhonota*	NL	NL	
Cooper's Hawk	*Accipiter cooperii*	NL	NL	
Common Raven	*Corvus corax*	NL	NL	
Common Yellowthroat	*Geothlypis trichas sinuosa*	NL	NL	BCC/SSC
Double-crested Cormorant	*Phalacrocorax auritus*	NL	NL	
Elegant Tern	*Thalasseus elegans*	NL	NL	
European Starling	*Sturnus vulgaris*	NL	NL	
Forester's tern	*Sterna forsteri*	NL	NL	
Gadwall	*Mareca strepera*	NL	NL	
Great egret	*Ardea alba*	NL	NL	
Greater Yellowlegs	*Tringa melanoleuca*	NL	NL	
House finch	*Haemorhous mexicanus*	NL	NL	
Hooded Oriole	*Icterus cucullatus*	NL	NL	
Horned lark	*Eremophila alpestris*	NL	NL	
Killdeer	*Charadrius vociferus*	NL	NL	
Lawrence's Goldfinch	*Carduelis lawrencei*	NL	NL	BBC
Light-footed Ridgway's rail	*Rallus obsoletus levipes*	FE	SE	FP
Long-billed Curlew	*Numenius americanus*	NL	NL	BCC
Lesser Goldfinch	*Spinus psaltria*	NL	NL	
Least Sandpiper	*Calidris minutilla*	NL	NL	
Lesser Yellowlegs	*Tringa flavipes*	NL	NL	
Loon sp.	*Gavia sp.*	NL	NL	
Loggerhead Shrike	*Lanius ludovicianus*	NL	NL	
Mallard	*Anas platyrhynchos*	NL	NL	
Marbled Godwit	*Limosa fedoa*	NL	NL	BCC
Mourning Dove	*Zenaida macroura*	NL	NL	

Table C-1 Bird Species Identified During the Avian Point Count Surveys Conducted Between 4 February and 30 July 2020

Common Name	Scientific Name	Federal Listing Status (ESA)	State Listing Status (CESA)	Other Conservation Listings
Northern Harrier	*Circus hudsonius*	NL	NL	SCC
Northern mockingbird	*Mimus polyglottos*	NL	NL	
Northern Pintail	*Anas acuta*	NL	NL	
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	NL	NL	
Orange-crowned warbler	*Leiothlypis celata*	NL	NL	
Osprey	*Pandion haliaetus*	NL	NL	
Peregrine Falcon	*Falco peregrinus*	Delisted	Delisted	BCC
Red-necked Phalarope	*Phalaropus lobatus*	NL	NL	
Red-throated Loon	*Gavia stellata*	NL	NL	
Red-winged Blackbird	*Agelaius phoeniceus*	NL	NL	
Ring-billed Gull	*Larus delawarensis*	NL	NL	
Royal tern	*Thalasseus maximus*	NL	NL	
Sanderling	*Calidris alba*	NL	NL	
Savannah Sparrow	*Passerculus sandwichensis*	NL	NL	SSC
Say's phoebe	*Sayornis saya*	NL	NL	
Semipalmated plover	*Charadrius semipalmatus*	NL	NL	
Semipalmated Plover	*Charadrius semipalmatus*	NL	NL	
Hummingbird s.	*Selasphorus sp.*	NL	NL	
Short-billed Dowitcher	*Limnodromus griseus*	NL	NL	
Solitary Sandpiper	*Tringa solitaria*	NL	NL	
Song sparrow	*Melospiza melodia*	NL	NL	
Surf Scoter	*Melanitta perspicillata*	NL	NL	
Tufted Duck	*Aythya fuligula*	NL	NL	
Warbling Vireo	*Vireo gilvus*	NL	NL	
Western Gull	*Larus occidentalis*	NL	NL	
Western Meadowlark	*Sturnella neglecta*	NL	NL	
Western Sandpiper	*Calidris mauri*	NL	NL	
Western snowy plover	*Charadrius nivosus nivosus*	FT	NL	SSC
White-throated Swift	*Aeronautes saxatalis*	NL	NL	
Whimbrel	*Numenius phaeopus*	NL	NL	BCC
Willet	*Tringa semipalmata*	NL	NL	BCC

Notes: No Critical Habitat at NBVC Point Mugu. Selections for Listing Status Column include: FE = federal endangered, FT = federal threatened, BCC = Federal Bird of Conservation Concern, SE = State endangered, SD = State delisted, SSC = Species of Special Concern (State designation), FP = State Fully Protected, NL = not listed.
CESA = California Endangered Species Act

Figure C.2-a Light-footed Ridgway's Rail Observed at NBVC Point Mugu in 2019

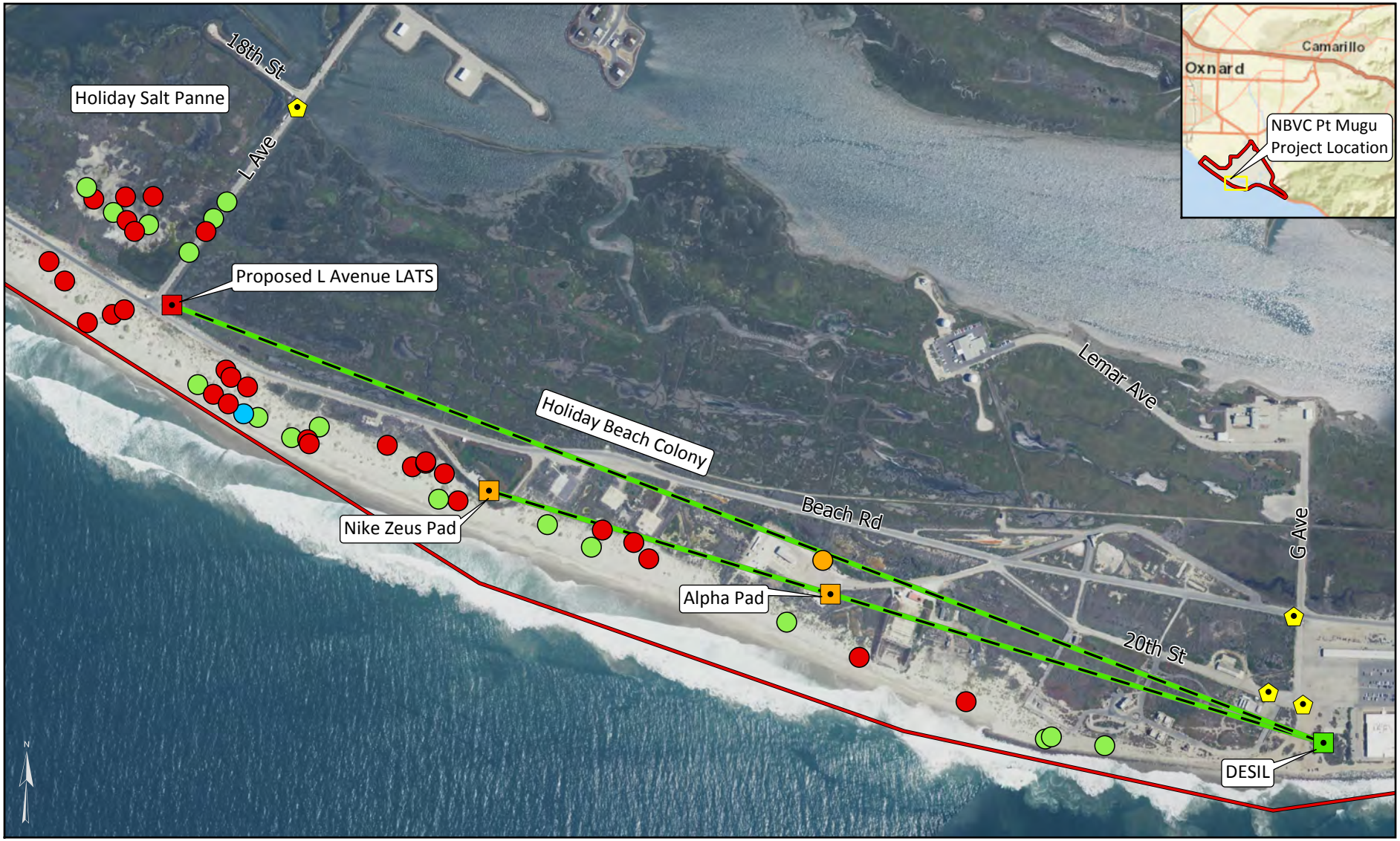


Figure C.2-b Western Snowy Plover Observed at NBVC Point Mugu in 2019

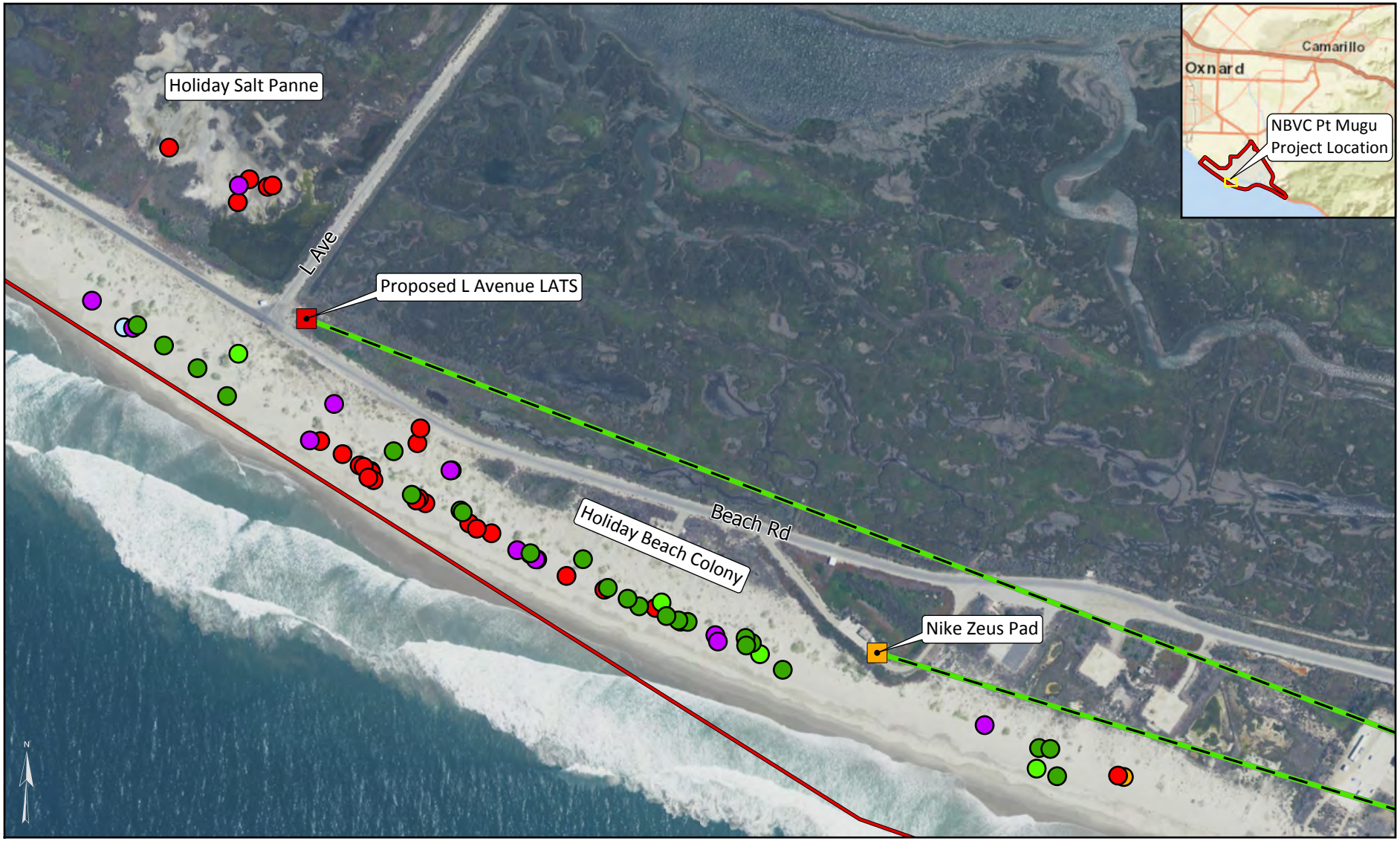


Figure C.2-c California Least Terns Observed at NBVC Point Mugu in 2019

Table C-2 presents the annual totals of observed CLTE at NBVC Point Mugu. In 2020, the number of nests were historically low with many of the nests lost to high tides or predation (i.e., coyotes and ravens) (NBVC, 2020).

Table C-2 California Least Tern Nests at Holiday Beach and Holiday Salt Panne, 2003-2020

	Holiday Beach	*Holiday Salt Panne*	*Total nests*
2003	1	0	1
2004	12	0	12
2005	108	0	108
2006	45	0	45
2007	65	6	71
2008	74	17	91
2009	170	26	196
2010	70	34	104
2011	31	2	33
2012	60	3	63
2013	164	11	175
2014	65	10	75
2015	278	22	300
2016	182	21	203
2017	165	20	185
2018	58	12	70
2019	63	6	69
2020	41	3	44

Source (Navy, 2020b)

Table C-3 Bats Documented or with Potential to Occur at NBVC Point Mugu

Common Name	Scientific Name	NBVC Point Mugu	Conservation Status
Bats	*Chiroptera*		
Pallid bat	*Antrozous pallidus*	+	SSC
Townsend's big-eared bat	*Corynorhinus townsendii*	P	SSC, FSC
Spotted bat	*Euderma maculatum*	P	SSC. FSC
Big brown bat	*Eptesicus fuscus*	+	
Western red bat	*Lasiurus blossevillii*	X	SSC
Hoary bat	*Lasiurus cinereus*	X	
Silver-haired bat	*Lasionycteris noctivagans*	P	
Canyon bat	*Paratrellus Hesperus*	P	
California myotis	*Myotis californicus*	P	
Small-footed myotis	*Myotis cilioabrum*	X	SSC, FSC
Yuma myotis	*Myotis yumanensis*	X	SSC, FSC
Western mastiff pat	*Eurmops perotis californicus*	X	SSC, FSC
Pocketed free-tailed bat	*Nyctinomops femorosaccus*	X	SSC
Big free-tailed bat	*Nyctinomops macrotis*	X	SSC, FSC
Mexican free-tailed bat	*Tadarida brasilensis*	X	

Notes:
X = Documented in 2012/2013 surveys
+ = Documented in previous surveys
P = Species with potential to occur
FSC = Federal Species of Concern: Former Category 2 Candidate
SSC = California Department of Fish and Wildlife Species of Special Concern

Appendix D
Laser Geometry and Operating Tempo

Laser Geometry

- Lasers would be tested either from a roof platform on the top of the DESIL (approximately 66 feet tall) or from an approximately 27- to 35-foot high platform mounted to a truck or trailer parked at the DESIL.
- Elevations of target sites vary with L Avenue LATS at 6 feet asl, Nike Zeus Pad at 20 feet asl, and Alpha Pad at 10 feet asl.
- Lasers would be fired at targets located at a height of no less than four feet off the ground. It is for this reason only birds were considered in the analysis. All other terrestrial and marine wildlife were eliminated from consideration.
- The longest laser trajectory would start at an approximate height of 66 feet (from the DESIL roof platform site) to the target at a height of 4 to 5 feet above the L Avenue LATS, at an approximate distance of 6,475 feet (1.97 km) to the northwest.
- The shortest laser trajectory would start at an approximate height of 27 to 35 feet (from the laser mounted on a truck or trailer at DESIL) to the target at a height of 4 to 5 feet above Alpha Pad 2,707 feet (0.82 km) to the north. See Table D-1 and Figure D-1.
- The typical diameter of the HEL beam would be 7.87 inches (20 centimeters).
- The typical diameter of the Lower Power Lasers such as the Dazzler would be 6.6 feet (2 meters).

Table D-1 Firing Distances for HEL and Lower Power Laser Systems

Laser Target Site	*Approximate ground distance from DESIL to each laser target site*	*Approximate laser length from 66-foot tall DESIL roof platform to each laser target site*	*Approximate laser length from 27- to 35-foot tall Truck/Trailer platform to each laser target site*
L Avenue LATS Building (proposed)	6,475 feet (1.97 km)	6,475 feet (1.97 km)	6,475 feet (1.97 km)
Alpha Pad (existing)	2,707 feet (0.82 km)	2,707 feet (0.82 km)	2,707 feet (0.82 km)
Nike Zeus Pad (existing)	4,582 feet (1.39 km)	4,582 feet (1.39 km)	4,582 feet (1.39 km)

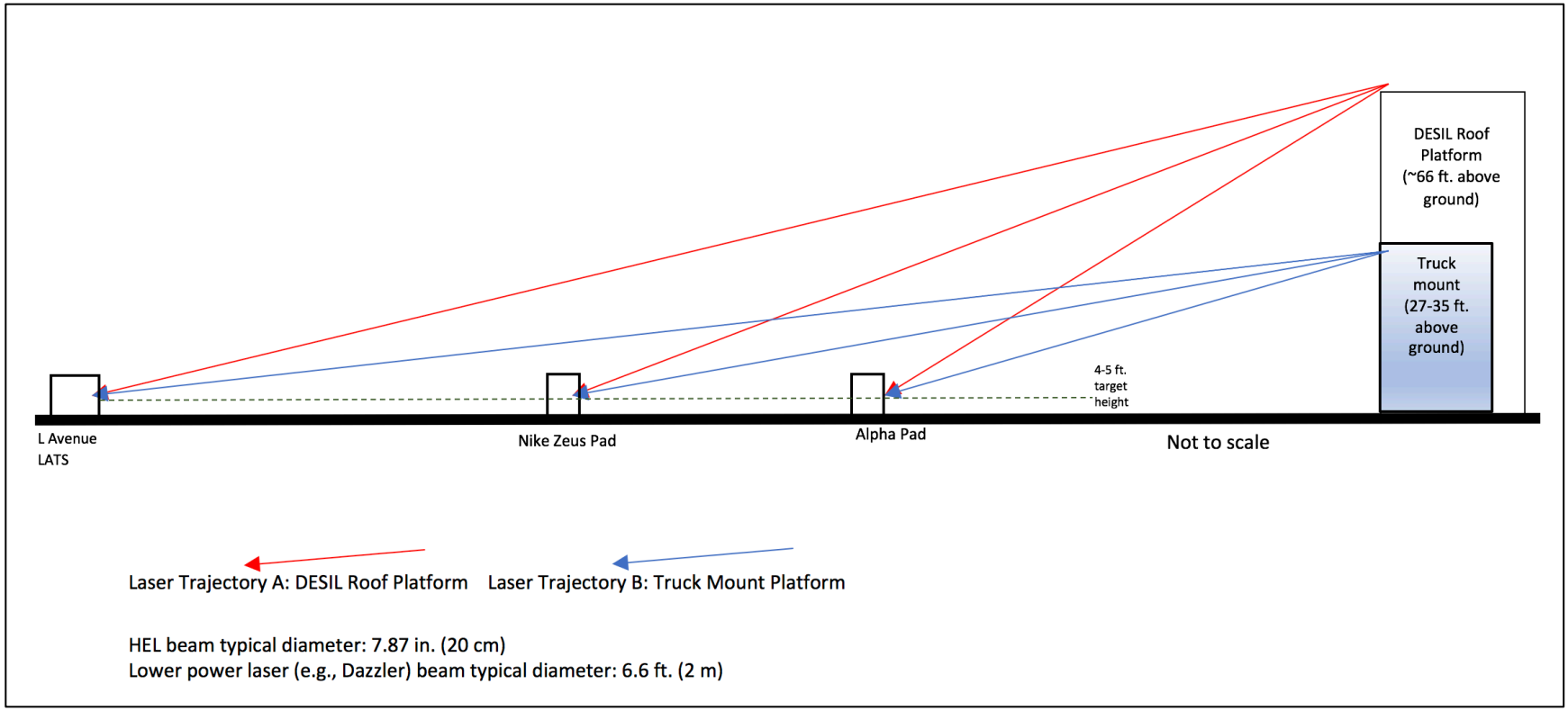


Figure D-1 Laser Beam Trajectories from DESIL to Land-Based Laser Target Site

Laser Operating Tempo and Supplemental Analysis

As presented in Table 2-2 *Proposed Operational Components and Activities,* HELs typically operate for a period of 10 seconds at a time. In a typical laser test event, most of the time is spent setting up targets, adjusting and calibrating instruments, and following a strict safety protocol that would preclude any laser being tested until the laser path is clear of birds. The cumulative period of time the HEL would be active during a 24-hour period would be approximately 5 minutes, (less than 0.35 percent of the time over a 24-hour period).

A total of approximately 5 minutes out of a 24-hour day is a short-duration considering that each HEL laser operation within that 24-hour period would typically last 10 seconds. Therefore, it is highly unlikely birds would be in the precise vertical and horizontal location to fly through an 8-inch wide HEL beam at the exact moment the HEL is being tested during any single 10-second operation.

Lasers are generally quiet when fired. Existing noise levels at NBVC Point Mugu are dominated by aircraft operations (75 to 80 decibels) and weapons testing (target launches). A laser could make some crackling noise depending on several factors such as humidity in the atmosphere but, unlike traditional weapons with projectiles (e.g., bullets, rockets), the laser is less likely to make wildlife flush from a sudden loud noise. In other words, firing a laser (non-visual) is unlikely to change bird behavior as use would not result in a sudden loud noise. Therefore, birds would be less likely to flush and fly into a laser as it is being fired due to any associated noises.

It is important to note that the Navy would also strive to avoid hitting birds because hitting anything other than the target would not achieve the purpose of the testing. The test would have to be repeated.

As presented in Table 2-2, Lower Power Lasers would be tested for longer periods of time than the HEL. For example, Lower Power Lasers may be fired multiple times during a given day for several minutes at a time; however, the maximum accumulated time of lasing would not exceed 30 minutes in a 24-hour period (2.08 percent of the time). The cumulative operating time of HEL and Lower Power Laser use is not anticipated to exceed 34 hours per year.

Although Lower Power Laser beam widths would typically be 6.6 feet (2 meters) in diameter, their power levels are significantly lower and are, therefore, not anticipated to injure wildlife especially given that a bird would have to be in the precise vertical and horizontal position to fly through a laser while it is being tested. While the potential health effects on wildlife are currently unknown, exposure to a Lower Power Laser (e.g., Dazzler) beam may result in temporary effects such as flash blindness and disorientation depending on power level and exposure times. Because birds would have to be flying to be exposed to a laser, exposure times are anticipated to be very brief (i.e., 1 second or less).

Lower Power Laser systems may use laser beams within the visual spectrum of light. It is not known if visibility of a Lower Power Laser (e.g., Dazzler) beam would elicit a response from birds thus causing incubating birds to leave nests or perched birds to take flight. Lasers have become a new tool to disperse birds (Blackwell et al., 2002; Opar, 2016); however, for these efforts' lasers are targeted directly at birds whereas these laser operations would be directed to a target and not at birds. Therefore, operation is not expected to elicit a significant response from birds in the area. There is a potential for a bird to react to the sudden appearance of Lower Power Laser beams within the visual spectrum of light waves especially during nighttime test events when lasers would have the most contrast against a dark

backdrop. For example, if a Dazzler beam is visible to CLTE and if the beam is tested over or near nesting areas, it may elicit a flush response or potentially disrupt incubation behavior. As a laser to L Avenue LATS may likely be an average of 250 feet away from most nesting terns, it is suspected CLTE are far enough away that a laser should not elicit a response (NBVC, 2020).

Appendix E
Minimization, Mitigation, Monitoring and Reporting (MMMR) Tracking Sheet

Table E-1 provides a comprehensive list of all impact mitigation, avoidance, and minimization measures that would be implemented as part of the Proposed Action. In addition, the table identifies the factors for evaluating effectiveness and the associated primary regulatory drivers for compliance.

Table E-1 Minimization, Mitigation, Monitoring and Reporting (MMMR)

Resource Area	*Measure*	*Anticipated Benefit*	*Evaluating Effectiveness and Regulation*	*Implementing and Monitoring*	*Responsibility*	*Estimated Completion Date*
All	Construction Measures: The contractor's resident engineer (or on-site construction manager) and all construction personnel will ensure that all measures will be implemented during the construction period of this project.	Air Quality, Biological Resources, Coastal Resources, Water Resources	Compliance with all applicable regulations	Duration of construction activities	Construction contractor	Completion of construction activities
Section 3.0: Resources Dismissed from Detailed Analysis	Cultural Resources: An NBVC-authorized archaeological monitor will be present during construction. Any inadvertent discovery of archaeological materials will be handled in accordance with the Navy's management practices, which include provisions for stopping work and notifying the appropriate parties. If human remains are inadvertently discovered, then the procedures established under NAGPRA and Office of the Chief of Naval Operations Instruction 11170.2 series, *Navy Responsibilities Regarding Undocumented Human Burials*, will be followed.	Protect potentially sensitive cultural resources	No impacts to cultural resources; Section 106 NHPA, NAGPRA	Regular communication /notification	Construction contractor and Navy	Completion of construction activities
	Hazardous Materials and Hazardous Wastes: To the extent practicable, the IRP and MRP sites will be avoided; however, if the sites will be disturbed, then proper Land Use Controls will be followed.	Continued public safety and proper land use controls implemented	No impacts from hazardous materials or wastes; CERCLA	Prior to and duration of construction activities	Construction contractor	Complete of construction activities

Table E-1 Minimization, Mitigation, Monitoring and Reporting (MMMR)

Resource Area	*Measure*	*Anticipated Benefit*	*Evaluating Effectiveness and Regulation*	*Implementing and Monitoring*	*Responsibility*	*Estimated Completion Date*
Section 3.0: Resources Dismissed from Detailed Analysis	Airspace/Airfield Operations: Prior to implementation of the Proposed Action, an AICUZ Waiver Request will be prepared and submitted by the Navy. The Navy will evaluate each laser systems and test plans to ensure that proper safety measures are in place and that the development and operations will be consistent with OPNAVINST 11010.36C, AICUZ Program. The Navy will evaluate each test scenario that includes a laser system emitting hazardous energy beyond the boundary of the DESIL to each of the land-based target sites to determine the risk mitigations that are required. Backstops will be installed to prevent a laser from extending beyond a target site should a target be breached. Navy observers will monitor targets at each target site with video and will end the laser test once it breaches the target, or if a fire starts. Fires shall be quickly suppressed to avoid smoke that could cause a visual impairment to aviation.	Continued mission-critical airfield operations and protect public safety	No impacts to airfield operations; OPNAVINST 11010.36C, AICUZ Program	Regular communication /notification	Navy	Prior to test events
	Public Health and Safety: Reconnaissance of the L Avenue site and potential drop arm gate locations will be undertaken by UXO personnel to confirm that no JATO motors are present prior to the start of construction. All intrusive construction activities will use anomaly avoidance techniques and be coordinated with the NBVC Explosive Safety Officer.	Public health and safety	Project safety record	Approval by the appropriate safety office	Navy	Prior to construction
	UXO: Prior to construction, the area will be evaluated for UXO potential and all necessary measures will then be taken to assess and remove any potential UXO.	Personnel safety during construction	Project safety record	Evaluation and safety adherence	Navy and construction contractor	Completion of construction activities
Section 3.1 Air Quality	Air Quality: Construction and operations will comply with applicable Ventura County Air Pollution Control District permitting and CARB Portable Equipment Registration Program compliance requirements, as necessary for mobile generators used for operations.	Protection of air quality	No impacts to air quality; Clean Air Act	During test events, evaluate generator use	Navy and construction contractor	Complete of construction activities and during test events

Table E-1 Minimization, Mitigation, Monitoring and Reporting (MMMR)

Resource Area	*Measure*	*Anticipated Benefit*	*Evaluating Effectiveness and Regulation*	*Implementing and Monitoring*	*Responsibility*	*Estimated Completion Date*
Section 3.2: Biological Resources (Construction)	No Construction During Bird Breeding Season: Construction of the LATS will occur outside of the nesting season for the LFRR, WSPL, and CLTE (Construction occurring between 1 September to 28 February).	Protection of terrestrial biological resources	No harm to listed birds; MBTA, ESA	During construction activities	Construction contractor and Navy	Completion of construction activities
	Flag Wetlands: Prior to construction activity at L Avenue LATS, wetland habitat will be flagged to avoid impacts. Flagging will then be removed after construction.	Protection of terrestrial biological resources	No impact to wetlands; CWA, ESA	Prior to construction activities	Construction contractor and Navy	Completion of construction activities
	Rare Plant Survey: Prior to construction of the L Avenue LATS a rare plant survey will be conducted focusing on salt marsh bird's-beak.	Protection of terrestrial biological resources	No impacts to salt marsh bird's-beak; ESA	Prior to construction activities	Construction contractor and Navy	Completion of construction activities
	Construction within Project Footprint: Construction footprint will be flagged and construction will not take place outside of the project footprint.	Protection of terrestrial biological resources	No direct impacts to areas outside of project footprint; ESA	During construction activities	Construction contractor and Navy	Completion of construction activities
	Limit on Drop Arm Installation: The drop arm at M Avenue will only be replaced when no WSPL are nesting within 200 feet of the proposed drop arm location.	Protection of terrestrial biological resources	No harm to the WSPL; ESA	During construction activities	Construction contractor and Navy	Completion of construction activities
	Sensitive Species Training: A qualified biologist will educate construction personnel about sensitive species and their habitats, identification, required conservation measures, and reporting requirements. The biologist will also attend operationally related meetings as needed.	Protection of terrestrial biological resources	No additional harm to species and habitat; ESA	Prior to construction activities	Navy	Completion of construction activities

Table E-1 Minimization, Mitigation, Monitoring and Reporting (MMMR)

Resource Area	*Measure*	*Anticipated Benefit*	*Evaluating Effectiveness and Regulation*	*Implementing and Monitoring*	*Responsibility*	*Estimated Completion Date*
Section 3.2: Biological Resources (Operations)	Use of Backstops: All target sites will be equipped with backstops to prevent lasers from shooting past or through a target.	Protection of biological and coastal resources	Laser containment systems work effectively; ESA	During construction and before test events	Construction contractor and Navy	Completion of construction and prior to test events
	Laser Monitoring: The laser path from the DESIL to each target will be monitored by operators to ensure that weapons are not fired if and when wildlife (birds) are within the path of a laser. The fidelity of the laser operator's ability to clearly see birds flying through the path of the laser between the DESIL and the LATS (1.2 miles apart) will be monitored by a qualified biologist during the first five operations occurring during the CLTE nesting season.	Protection of terrestrial biological resources	Minimize harm to birds; ESA	Prior to and during each test event.	Navy	Completion of test events
	Lighting: Permanent outdoor lighting shall include shielding designs to ensure light entering adjacent nesting habitat is minimized. Lights will be shut off if nighttime operations are not occurring.	Protection of terrestrial biological resources	Lights shut off as planned; ESA	During construction and after test events	Navy	Completion of test events
	Sensitive Species Training: A qualified biologist will educate operational personnel about sensitive species and their habitats, identification, required conservation measures, and reporting requirements. The biologist will also attend operationally related meetings as needed.	Protection of terrestrial biological resources	No additional harm to species and habitat; ESA, CWA	Prior to test events	Navy	Prior to testing events
	Vegetation: Dry vegetation will be periodically cleared around the target site to further reduce the low-potential for fires.	Protection of terrestrial biological resources	Any low-potential fires do not spread to vegetation; ESA	Prior to test events	Navy	Prior to testing events
	Trash Containment: Trash collection containers will not be located outdoors. Outdoor areas will be maintained trash free to reduce attracting predators.	Reduction of litter and protection of wildlife	No trash observed; ESA	Prior to, during, and after testing events	Navy	Completion of test events

Table E-1 Minimization, Mitigation, Monitoring and Reporting (MMMR)

Resource Area	*Measure*	*Anticipated Benefit*	*Evaluating Effectiveness and Regulation*	*Implementing and Monitoring*	*Responsibility*	*Estimated Completion Date*
Section 3.2: Biological Resources (Monitoring)	Wildlife Monitoring During Breeding Season: A qualified Navy biologist or trained personnel will monitor the first five HEL and first five Lower Power Laser operations during the CLTE nesting season from 1 May to 1 August in the first year of operations. The qualified biologist or trained personnel will monitor bird activity at the target site area at closest position that safely allows (or where the most tern nesting activity is located) to ensure the operator or spotter at the DESIL is able to observe the same activity and confirm the efficacy of communications and monitoring equipment. This will include monitoring when lasers using visible spectrum of light waves are used near active CLTE and WSPL nests (e.g., during nighttime or evening operations) during the first year of laser operations. During the first year of laser operations, no less than five monitoring sessions will take place during the nesting season from 1 May to 1 August.	Protection of terrestrial biological resources	No additional harm to LFRR, WSPL, CLTE; ESA	During test events during the breeding season	Navy	Completion of test events
	Wildlife Data Collection if Laser Interaction: A qualified biologist or trained personnel will walk the laser path as soon as operationally feasible if a bird-laser interaction was observed or suspected. The Navy's Natural Resources staff at Point Mugu will be contacted to identify any potentially injured or deceased birds.	Protection of terrestrial biological resources	No additional harm to LFRR, WSPL, CLTE; ESA	After daytime test events	Navy	Completion of test events
	Wildlife Monitoring After Nighttime Ops During Breeding Season: A qualified biologist or trained personnel will walk the laser path looking for any birds that may have been impacted by laser operations the first morning following nighttime operations occurring from 1 May through 1 August during the first year of operations. Annual findings involving federally listed species will be reported back to USFWS.	Protection of terrestrial biological resources	No additional harm to LFRR, WSPL, CLTE; ESA	After nighttime test events	Navy	Completion of test events
	Field Camera During 1st Year: A field camera will be placed by or at LATS target site during the CLTE nesting season the first year of operations. The field camera will be focused on areas with the highest concentrations of nesting CLTE. A qualified biologist or trained personnel will review footage to assess if there were any bird/laser interactions.	Protection of terrestrial biological resources	No additional harm to CLTE; ESA	During and after test events	Navy	Completion of test events

Table E-1 Minimization, Mitigation, Monitoring and Reporting (MMMR)

Resource Area	*Measure*	*Anticipated Benefit*	*Evaluating Effectiveness and Regulation*	*Implementing and Monitoring*	*Responsibility*	*Estimated Completion Date*
Section 3.2: Biological Resources (Monitoring)	Nest Monitoring: Biologists will be granted access to beach areas as much as possible during operational periods when lasers are not energized to monitor CLTE and WSPL nesting activity during test events.	Protection of terrestrial biological resources	Regular access to check for no additional harm; ESA	During test events	Navy	Completion of test events
	Recording: Trail cameras will be placed on active tern and/or plover nests that are closest to the laser's path to monitor behavior during the first five Dazzler operations.	Protection of terrestrial biological resources	Visual data recorded; ESA	During Lower Power Laser test events	Navy	Completion of test events
	Nesting Surveys: A qualified Navy biologist will conduct regular nesting surveys on the adjacent Holiday Beach and Holiday Salt Panne to locate and track CLTE and WSPL nests. Any increase in abandonment of nests will be discussed with the USFWS to investigate if it may be related to laser operations. The results of biological monitoring will be included in an annual report that will be submitted by the Navy to the USFWS.	Protection of terrestrial biological resources	No additional harm to CLTE and WSPL; ESA	During test events	Navy	Completion of test events
	Monitor Nesting Areas/Laser Path near CLTE: A qualified biologist or trained personnel will walk the laser path near CLTE nesting areas a minimum of once a month during May, June, and July to search for any birds that may have been impacted by laser operations. Survey the laser path near CLTE nesting areas after each operational day under the following circumstances: If 50 or more tern nests are detected between Nike Zeus and DESIL (when Nike Zeus site used); or if 200 or more tern nests are detected between DESIL and L Avenue.	Protection of terrestrial biological resources	No additional harm to CLTE; ESA	During summer test events	Navy	Completion of test events
Section 3.3: Coastal Resources	Elevation of L Avenue LATS: The proposed L Avenue LATS may be elevated one to three feet depending on an engineering analysis in order to provide protection against potential sea level rise and associated effects.	Prevent potential impacts from sea-level rise	No flooding from sea level rise; EO 11988	Prior to construction activities	Navy	Completion of construction activities

Table E-1 Minimization, Mitigation, Monitoring and Reporting (MMMR)

Resource Area	*Measure*	*Anticipated Benefit*	*Evaluating Effectiveness and Regulation*	*Implementing and Monitoring*	*Responsibility*	*Estimated Completion Date*
Section 3.4: Water Resources	Stormwater BMPs: The contractor will develop and implement site-specific stormwater BMPs. The BMPs will include the type, placement, and maintenance of erosion control features to be used during and following demolition and construction activities to ensure no impacts to nearby wetlands.	Prevent runoff, sedimentation, and erosion	BMPs work as designed; CWA, UFC 3-210-10, Low LID, and EISA	No indirect impacts to resources from runoff	Construction contractor	Completion of construction activities
	Placement of Straw Wattle Buffers: Before the start of site grading and construction activities, straw wattle buffers (certified weed free) will be placed within and around the project area to reduce surface water flow velocities, and retard soil erosion and off-site transport.	Prevent runoff, sedimentation, and erosion	BMP work as designed; CWA, Low LID and EISA	Prior to construction. Regularly inspect straw wattles for performance.	Construction contractor and Navy	Completion of construction activities
	Avoidance of Excavated Areas: Construction equipment will be directed to avoid places where pavement has been removed to prevent soil erosion. Sites for temporary stockpiling and handling of recyclable wastes will be established on site and avoided. When appropriate, stockpiled materials will be covered with tarps or other suitable materials, and the piles will be enclosed with a sediment fence to prevent wind- or rain-induced runoff and dispersion. Any encountered potentially contaminated materials will be disposed of in accordance with applicable federal, state, and local requirements.	Prevent runoff, sedimentation, and erosion	Little to no erosion detected; CWA, Low LID and EISA	Prior to construction. Regularly inspect for proper establishment and avoidance.	Construction contractor and Navy	Completion of construction activities
	Concrete Washout: If concrete is used, concrete trucks will be washed out in a designated area where the material cannot run off-site or percolate into the groundwater. This area will be specified on all applicable construction plans and be in place before any concrete is poured. All residual solids will be cleaned daily. In the event concrete/asphalt cutting is performed with a wet saw, all water will be contained and residual solids will be cleaned up.	Prevent runoff, sedimentation, and erosion	No indirect impacts to resources from runoff; CWA, Low LID and EISA	During construction. Regularly inspect for proper performance.	Construction contractor and Navy	Completion of construction activities

Table E-1 Minimization, Mitigation, Monitoring and Reporting (MMMR)

Resource Area	*Measure*	*Anticipated Benefit*	*Evaluating Effectiveness and Regulation*	*Implementing and Monitoring*	*Responsibility*	*Estimated Completion Date*
Section 3.4: Water Resources	Tarping of Washout Trap: If rain occurs, a tarp or some other impermeable material will be placed for the concrete wash out traps to minimize inadvertent runoff.	Prevent runoff, sedimentation, and erosion	No inadvertent runoff; CWA, Low LID and EISA	During construction. Regularly inspect for proper performance.	Construction contractor and Navy	Completion of construction activities
	Vehicle and Work Area Maintenance: Upon entering the site and daily thereafter, equipment will be inspected and maintained prior to working on site. Any leaks or hoses/fittings in poor condition will be repaired before the equipment begins work. Construction equipment will be staged on site in designated staging areas. All vehicles leaving the site will be inspected to prevent dirt/debris from being transported off site. All material/waste storage areas will be inspected daily to ensure containers are in good condition. All storm drain inlets in the work area will be protected to prevent dust and/or debris from entering the drain(s).	Prevent runoff, sedimentation, and erosion	No indirect impacts to resources from runoff; CWA, Low LID and EISA	During construction. Regularly inspect for proper performance.	Construction contractor and Navy	Completion of construction activities
	Storm Drain Catch Basins: Storm drain catch basins in the construction area will be covered so that sediment and debris do not enter the catch basins during construction. Sediment and debris from the work site will be swept up and properly disposed of, so that they will not be tracked off site and enter a storm drain or receiving water.	Prevent runoff, sedimentation, and erosion	Stormwater runoff flows as engineered; CWA, Low LID and EISA	During construction. Regularly inspect for proper performance.	Construction contractor and Navy	Completion of construction activities
	Rainy Season: Should construction occur during the rainy season (October through May), any soil, gravel, or debris stockpiles will be covered/bermed to prevent rain from washing away the stockpiles.	Prevent runoff, sedimentation, and erosion	No indirect impacts to resources from runoff; CWA	During construction. Regularly inspect for proper performance.	Construction contractor and Navy	Completion of construction activities

Table E-1 Minimization, Mitigation, Monitoring and Reporting (MMMR)

Resource Area	*Measure*	*Anticipated Benefit*	*Evaluating Effectiveness and Regulation*	*Implementing and Monitoring*	*Responsibility*	*Estimated Completion Date*
Section 3.4: Water Resources	Site Cleanup Process: If metal cutting, grinding, or welding is part of the project (such as concrete reinforcing bars or metal fencing), measures will be put in place to prevent those pollutants from entering the water or storm drain systems. Also, at a minimum, metal slag/residues/shavings will be swept up and properly disposed at the end of each workday.	Protection of soils, waterways, and associated wildlife and plants	No indirect impacts to resources from runoff; CWA, ESA	During construction. Regularly inspect for proper performance.	Construction contractor	Completion of construction activities
	Drip Pans: Drip pans shall be placed under equipment to catch leaks. These drip pans shall be cleaned periodically. During rain events, these drip pans shall be moved so that the stormwater runoff does not become contaminated from their contents.	Prevent runoff, sedimentation, and erosion	No indirect impacts to resources from runoff; CWA	During construction. Regularly inspect for proper performance.	Construction contractor	Completion of construction activities
	Wash Water Procedures: Wash water and residue from concrete and/or masonry work shall not be discharged into the storm drain or sanitary sewer systems. Wash water shall be contained in a concrete washout area and allowed to evaporate, with the remaining solids disposed of as solid waste. With written approval from NBVC environmental staff, the construction contractor may have the option to discharge wash water onto a pervious soil surface and allow it to infiltrate into the soil. Any remaining residue shall be disposed of as solid waste.	Protection of soils, waterways, and associated wildlife and plants	No indirect impacts to resources from runoff; CWA and ESA	Prior to and during construction activities; monitor for proper performance	Construction contractor	Completion of construction activities
	Limits on Use of Galvanized Materials: The project will avoid the use of galvanized materials, or will add an additional coating to the material to reduce the potential for zinc leaching into stormwater runoff.	Protection of soils, waterways, and associated wildlife and plants	No indirect impacts to resources from runoff; CWA and ESA	Prior to and during construction activities	Construction contractor	Completion of construction activities

Table E-1 Minimization, Mitigation, Monitoring and Reporting (MMMR)

Resource Area	*Measure*	*Anticipated Benefit*	*Evaluating Effectiveness and Regulation*	*Implementing and Monitoring*	*Responsibility*	*Estimated Completion Date*
Section 3.4: Water Resources	Steps to Minimize Soil Loss: The final project design will include engineering controls to stabilize cut slopes and exposed surfaces to minimize soil loss and impacts to surface water quality and the saltmarsh adjacent to the L Avenue construction area. Runoff will not be directed to adjacent wetlands.	Prevent stormwater pollution, runoff sedimentation, and erosion	No indirect impacts to resources from erosion; CWA	Include engineering controls in project design plans. Periodically maintain and monitor.	Construction contractor and Navy	Completion of construction activities
	Wetlands: A qualified wetland biologist will flag adjacent wetlands and potentially jurisdictional waters prior to earth moving activities or vegetation removal. Daily QC meetings will include a reminder of wetland boundaries and avoiding activities that might cause impacts to all appropriate personnel handling equipment. Construction activities, either direct (use of equipment) or indirect (runoff, debris) will be confined to areas away from the edge of wetlands. There will be a set back of a few feet to ensure a safe distance from wetlands.	Protection of waterways and associated wildlife and plants	No impacts to wetlands; CWA	Prior to and during construction activities	Construction contractor and Navy	Completion of construction activities
	Footprint: Should the final engineering require an expanded project footprint with the potential to impact jurisdictional waters, the Navy will coordinate with the U.S. Army Corps of Engineers to determine if the Navy will be required to obtain a Water Quality Certification (per Section 401 of the CWA) and a wetland fill permit (per Section 404 of the CWA) prior to construction of the shoreline protection activities. Additional mitigation measures to minimize the potential for adverse impacts might be required, as set forth during the Section 401 and 404 of the CWA permitting process.	Protection of waterways and associated wildlife and plants	Project abides by permit requirements, as applicable; CWA	Prior to and during construction activities	Construction contractor and Navy	Completion of construction activities

Legend: AICUZ = Air Installation Compatible Use Zone; ANSI = American National Standards Institute; BMPs = Best Management Practices; CLTE = California Least Tern; CWA = Clean Water Act; DESIL = Directed Energy Systems Integration Laboratory; EO = Executive Order; EISA = Energy Independence Security Act; ESA = Endangered Species Act; IRP = Installation Restoration Program; LATS = Laser Target Site; LFRR = light-footed Ridgway's rail; LID = Low Impact Development; MBTA = Migratory Bird Treaty Act; MRP = Munitions Response Program; NAGPRA = Native American Graves Protection and Repatriation Act; NBVC = Naval Base Ventura County; NHPA = National Historic Preservation Act; OPNAVINST = Office of the Chief of Naval Operations Instruction; UFC = Unified Facilities Criteria; USFWS = U.S. Fish and Wildlife Service; WSPL = Western snowy plover.

Appendix F
Biological Opinion on the DESIL LATS

United States Department of the Interior
U.S. FISH AND WILDLIFE SERVICE
Ecological Services
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

IN REPLY REFER TO:
08EVEN-2021-F-0039

April 16, 2021

Captain Jeff H. Chism
U.S. Navy, Commanding Officer
Naval Base Ventura County
311 Main Road, Suite 1
Point Mugu, California 93042

Subject: Biological Opinion on the Directed Energy Systems Integration Laboratory (DESIL) Land-Based Laser Target Sites Project, Naval Base Ventura County Point Mugu, Ventura County, California

Dear Captain Chism:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of the U.S. Navy's (Navy) proposed Directed Energy Systems Integration Laboratory (DESIL) land-based laser target sites project (project) at Naval Base Ventura County (NBVC) Point Mugu and its effects on the federally endangered California least tern (*Sterna antillarum browni*), in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 et seq.). We received your October 6, 2020, request for formal consultation on October 8, 2020.

We have based this biological opinion on information that accompanied your October 6, 2020, request for consultation, including the biological assessment (Navy 2020a).

Not Likely to Adversely Affect Determinations

Light-footed Ridgway's Rail and Western Snowy Plover

The Navy's request for consultation also included the determination that the proposed action may affect, but is not likely to adversely affect, the federally endangered light-footed Ridgway's rail (*Rallus obsoletus levipes*) and the federally threatened western snowy plover (*Charadrius nivosus nivosus*).

Light-footed Ridgway's rail occurs at NBVC Point Mugu and has been documented as recently as 2019. The Navy documented nine breeding pairs during annual breeding surveys (Navy 2020b, p. 20). Light-footed Ridgway's rails are year-round residents at NBVC Point Mugu (breeding from March 1 to September 1) and are dependent upon coastal salt marsh habitat at Mugu Lagoon. Light-footed Ridgway's rails have been observed within 500 feet of the proposed laser target site, and a territory is located just north and east of the site (Navy 2020a, p. 18).

Western snowy plovers are year-round residents at NBVC Point Mugu and generally breed between March 1 and September 31. During the 2019 breeding season the Navy recorded a high count of 104 adult western snowy plovers and a minimum of 39 active nests (Navy 2020b, p. 25). Outside of the breeding season, western snowy plovers utilize foraging habitat at NBVC Point Mugu, none of which is present within 400 feet of the proposed laser target site (Navy 2020a, p. 26).

Construction activities at the proposed permanent target site may affect light-footed Ridgway's rails or western snowy plovers in the vicinity if work is conducted during the breeding season. Noise from construction activities could disturb breeding birds, resulting in disruption of breeding behavior or nest abandonment. Effects to light-footed Ridgway's rail and western snowy plover from construction conducted outside of the breeding season would likely be insignificant and discountable because there is a substantial amount of available foraging habitat in the vicinity of the site and outside of the area of potential effect; thus, individuals would be able to avoid the project area (Navy 2020a, p. 26). No construction would occur at the two mobile target sites.

Land-to-land laser operations may affect light-footed Ridgway's rails or western snowy plovers by injuring or killing individuals entering the beam; however, effects on wildlife of momentary exposure to lasers are not well-studied, and these effects are therefore speculative (Navy 2020a, p. 27). The Navy reports that the cumulative laser operating time will not exceed 34 hours per year. The Navy also reports that the height of the laser beams would slope from an approximate height of 66 feet at the DESIL to no less than 4 or 5 feet above the ground at the L Avenue laser target site and each mobile land-based laser target site (Navy 2020a, pp. 30). Light-footed Ridgway's rails are secretive marsh birds that typically remain under dense cover (NBVC staff have never observed wild individuals flying in 19 years of monitoring); western snowy plovers mostly fly along the ground and rarely higher than a few feet. The height of the laser closest to where light-footed Ridgway's rails nest (along the laser path to the L Avenue laser target site) would range from approximately 66 feet to 5 feet, which is above the height of the vegetation

cover. The height of the laser closest to where western snowy plovers nest (near Nike Zeus Pad) would be approximately 35 to 50 feet, which is well above the height of any potential flight activity by western snowy plovers (Navy 2020a, p. 31). Based on the duration of laser operations (34 hours per year) and the beam's height, we believe direct contact with the beam is not reasonably certain to occur; however, visual disturbance from operations could elicit a startle response and result in disrupted breeding behavior or nest abandonment by light-footed Ridgway's rail or western snowy plover.

The Naval Airfield at NBVC Point Mugu is less than 1 mile from the project area and within the 75 to 80 A-weighted decibel (dBA) contour related to airfield operations (Navy 2020a, p. 24). There were no airfield-related effects to light-footed Ridgway's rails or their habitat documented in 2018 or 2019 (Navy 2019, p. 23; Navy 2020a, p. 24). Similarly, no airfield-related effects to western snowy plover were recorded in 2019 (Navy 2020b, p. 34). Existing ambient noise may include, but is not limited to, sounds from the naval airfield and vehicle use on roads within the installation. Therefore, light-footed Ridgway's rail and western snowy plover are already subjected to noise that could cause a startle response that would likely exceed a response to visual disturbance from the proposed land-to-land laser operations.

Avoidance Measures

The Navy proposes to implement the following measures to avoid adverse effects to the light-footed Ridgway's rail and western snowy plover:

- The Navy will construct laser target sites outside of the nesting season for the light-footed Ridgway's rail and western snowy plover (Construction occurring between September 1 to February 28).

- The Navy will flag nearby wetland habitat for the light-footed Ridgway's rail prior to construction activity at laser target sites.

- The Navy will ensure construction does not take place outside of the project footprint.

- The Navy will equip all target sites with backstops to prevent lasers from shooting past or through a target.

- An operator will monitor the laser path from the DESIL to each target to ensure that weapons are not fired if and when wildlife (birds) are within the path of a laser. A qualified biologist will monitor the fidelity of the laser operator's ability to clearly see birds flying through the path of the laser between the DESIL and the laser target site (1.2 miles apart) during first five operations.

- The Navy will utilize shielded designs for permanent outdoor lighting to ensure light entering adjacent nesting habitat is minimized. Lights will be shut off if nighttime operations are not occurring.

- The Navy will clear dry vegetation around the target site to further reduce the low potential for fires to reach nearby listed species habitat.

- The Navy will ensure that trash collection containers are not located outdoors, and will maintain outdoor areas free of trash to reduce attracting predators or scavengers.

- A qualified biologist or trained personnel will:

    - Educate construction personnel about sensitive species and their habitats, identification, required conservation measures, and reporting requirements. The biologist will also attend operationally related meetings as needed;

    - Monitor the first five (High Energy Laser) HEL and first five Lower Power Laser operations during the height of the breeding season from May 1 to August 1 in the first year of operations. The qualified biologist or trained personnel will monitor bird activity at the target site area at the closest position that safety allows to ensure the operator or spotter at the DESIL is able to observe the same activity and confirm the efficacy of communications and monitoring equipment;

    - Walk the laser path as soon as operationally feasible if a bird-laser interaction was observed or suspected. Personnel will contact the Navy's Natural Resources staff at NBVC to identify any injured or deceased birds;

    - Walk the laser path looking for any birds that may have been impacted by laser operations the morning following nighttime operations occurring from May 1 through August 1 during the first year of operations. The Navy will report annual findings involving federally listed species to the Service;

    - Monitor bird behavior when lasers using the visible spectrum of light waves are used near active western snowy plover nests. Observers will note reactions that may affect incubation behavior. Observations will ideally take place in a low light environment (e.g., during nighttime or evening operations) when lasers would be most visible. During the first year of laser operations, no less than five monitoring sessions will take place during the nesting season from May 1 through August 1; and

    - Conduct regular nesting surveys on the adjacent Holiday Beach and Holiday Salt Panne to locate and track western snowy plover nests. The Navy will discuss any increase in abandonment of nests with the Service to investigate if it may be

related to laser operations. The Navy will include results of biological monitoring in an annual report that will be submitted to the Service.

- The Navy will review trail camera footage to confirm the lack of disturbance to incubating western snowy plovers from laser operations. The Navy routinely places trail cameras on selected western snowy plover nests across the entire installation to identify predator activity and to determine nesting success. Any trail cameras that the Navy happens to place on nests within the laser testing area during operational periods would also capture behavioral data on incubating western snowy plovers.

Conclusion

After reviewing the information provided, we concur with your determination that the proposed action may affect, but is not likely to adversely affect the light-footed Ridgway's rail and western snowy plover. Our concurrence is based on the following:

1. No construction will occur during the breeding season.

2. Existing disturbance from airfield operations likely exceeds noise generated by construction activities or visual disturbance from laser beams.

3. Foraging habitat for non-breeding light-footed Ridgway's rails and western snowy plovers is widespread beyond the project area; thus, individuals will be able to avoid construction-related disturbance.

4. Direct contact with the laser beam is not reasonably certain to occur.

5. The Navy will implement all aforementioned avoidance measures to avoid adverse effects to listed species.

Our concurrence with the determination that the proposed action is not likely to adversely affect light-footed Ridgway's rail and western snowy plover is contingent on the measures outlined above being implemented by the Navy. If the Navy fails to implement these measures, we will consider our concurrence invalid. If the proposed action changes in any manner or if new information reveals the presence of listed species in the project area, you should contact our office immediately and suspend all project activities until the appropriate compliance with the Act is completed.

Consultation History

On February 22, 2021, the Service issued a draft biological opinion to the Navy for review. The Navy provided comments on the draft biological opinion by email on February 26, March 8, and April 6 2021, and by phone call on March 1 and March 31, 2021.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

Overview

The proposed project would occur at NBVC Point Mugu. NBVC Point Mugu is a component of NBVC, which was formed in 2000 with the consolidation of naval installations at Point Mugu, Port Hueneme, and San Nicolas Island. NBVC Point Mugu is composed of 4,500 acres of land including support facilities and infrastructure and is situated along the coast of Ventura County, California approximately 5 miles south of Oxnard and 50 miles west of Los Angeles. Naval Surface Warfare Center Port Hueneme Division is also located at NBVC in the coastal area of Southern California adjacent to the Point Mugu Sea Range. Proximity to the Point Mugu Sea Range represents a superior geographical location for directed energy testing of high energy lasers in a maritime environment.

The Navy proposes to conduct land-to-land laser operations at NBVC Point Mugu from the DESIL to a proposed permanent land-based laser target site located at L Avenue and two additional mobile land-based laser target sites located at the existing Nike Zeus Pad and Alpha Pad. The permanent laser target site would be comprised of a new 400- to 500-square-foot, one-story (approximately 15 to 18 feet high) building to house electro-optical instrumentation for the characterization of laser beams, to perform studies, and to verify laser system operation prior to live testing and evaluation events. The mobile target sites at the Nike Zeus Pad and Alpha Pad would consist of container express (CONEX) boxes (or similar), trailers, instrumentation equipment, target boards, and other temporary support equipment such as portable generators and/or chiller.

The Navy would also install up to five new manually operated drop arms across area roads to limit access to the area between the DESIL and the target sites during laser operations. The drop arms would have a height of approximately 15 to 18 feet.

A map of the action area is provided in Figure 2-1 of the biological assessment (Navy 2020a, p. 4) and reproduced below:

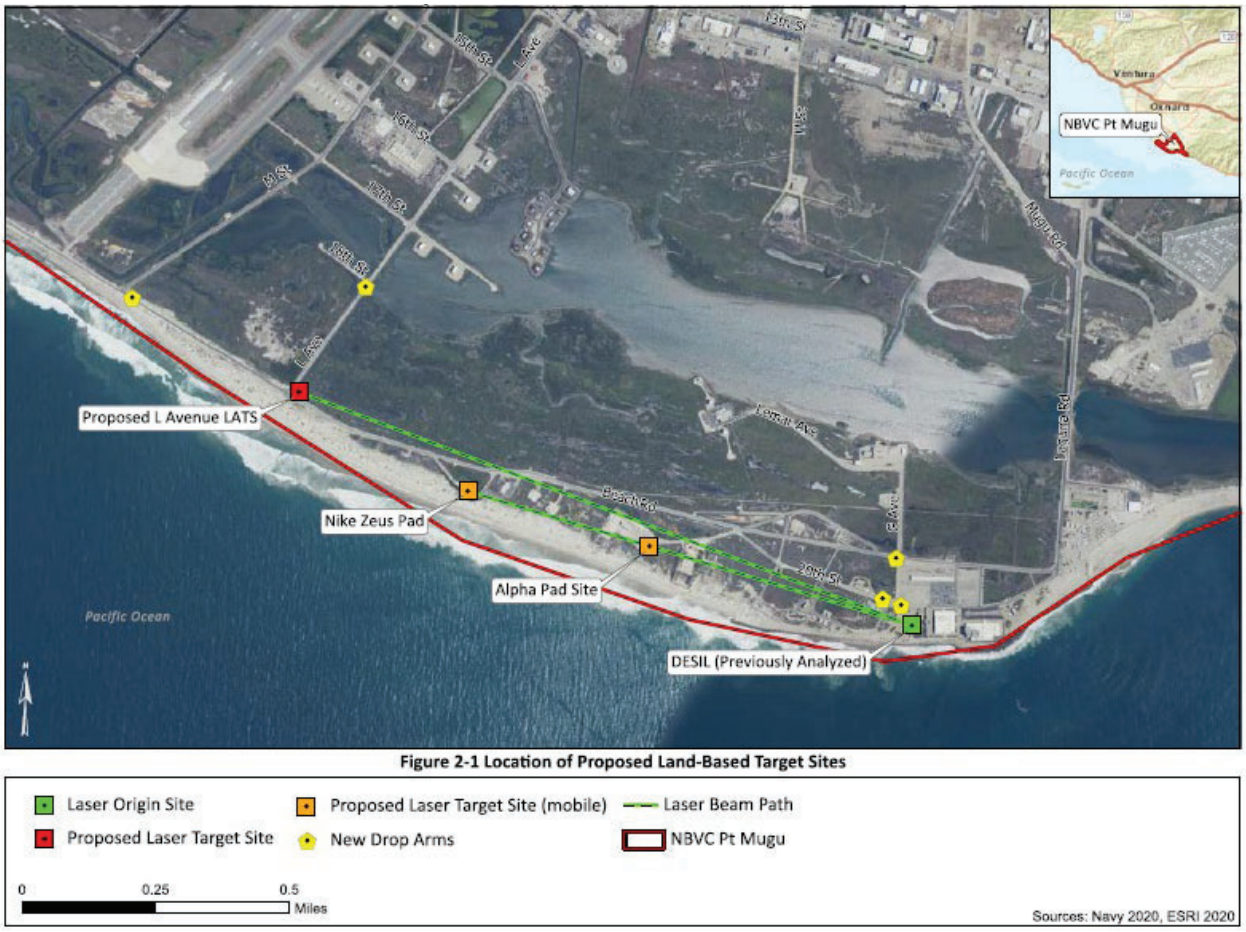


Figure 2-1 Location of Proposed Land-Based Target Sites

Activities

Construction

The Navy proposes to construct the new laser target site building on the northeast corner of L Avenue at the intersection of Beach Road. This would be a permanent structure located within the line of sight of DESIL, which is approximately 1.2 miles to the southeast within NBVC Point Mugu. Site preparation for the L Avenue laser target site would include construction laydown, clearing, excavation, and preparation for construction. Paving and site improvements would consist of mobile equipment pads, parking, and stormwater management infrastructure. The Navy proposes construction of up to a 6,000-square-foot area with driveway access. The resulting improvements would consist of the following features:

> **Target Bays:** The laser target site building would include two target bays in which targets and electro-optical instrumentation would be set up for illumination by laser systems.

Concrete Pads: The laser target site building would have two adjacent mobile equipment concrete pads; one in front of the target bays a minimum of 40 feet wide and the second on the rear side of the structure a minimum of 16 feet wide. Parking would be provided for a minimum of four vehicles. Mobile instrumentation/targets could also be located at the laser target sites for use by laser systems at DESIL.

Utilities: The laser target site building would have potable water service to support maintenance activities. Electrical utilities would include primary and secondary electrical distribution systems, interior and exterior lighting, and telecommunications infrastructure.

Drop Arms: The Navy proposes to install five manually operated drop arms across area roads to limit access to the area between the DESIL and the target sites during laser operations. The drop arms would have a height of approximately 15 to 18 feet and be installed at South L Avenue at the 18th Street intersection, Beach Road at South M Avenue, Beach Road on the western side of G Avenue intersection, 20th Street west of G Avenue, and the entrance to the improved roadway for Surfer Beach access. The Navy may refurbish two currently existing drop arms, which would reduce the number of new manually operated drop arms from five to three.

Construction Duration: The Navy anticipates construction of the laser target site building would take approximately 2 to 3 months to complete.

The proposed mobile target sites at Nike Zeus Pad and Alpha Pad are existing structures currently used in support of other testing activities. The Navy does not propose any construction, modifications, or improvements for Nike Zeus Pad and Alpha Pad. Both Nike Zeus and Alpha Pads have existing access roads to allow the delivery of mobile targets and other necessary instrumentation.

Operations

Under the proposed project, the Navy would operate laser systems from the roof of the DESIL, or from a trailer in the rear yard of DESIL, and directed at targets at the L Avenue permanent laser target site and at the Nike Zeus and Alpha Pad mobile sites. The roof-mounted laser would be approximately 66 feet above the ground, and the trailer-mounted laser would be approximately 27 to 35 feet above the ground.

The Navy would use tractor trailers to transport the target enclosure and instrumentation to the mobile target sites as part of pre-event set-up and post-event tear-down. The Navy would use pick-up trucks for personnel and equipment transportation pre-event, during the event, and post-event. In addition, the Navy would use a 4-wheel drive forklift and/or crane to load and unload equipment.

Operation of the permanent laser target site and mobile target sites would involve scheduled testing activities that direct laser energy at the three land-based laser targets from fixed laser sources located at DESIL. The Navy anticipates conducting laser testing up to 116 days per year, including some events occurring during the nighttime. Initial laser testing may occur a few times per year and may increase over time (up to 116 days), but may occur less frequently depending on operational requirements, test objectives, and scheduling availability. The Navy does not anticipate that cumulative operating time lasers would exceed 34 hours per year. Typical test event duration would be several hours or more in a 24-hour period. Multiple lasers could be operated within an event. Typical event duration time would include the initial set-up, road closure, testing, an all-safe determination, then road opening.

Lasers are being continually developed and refined with new operating times (i.e., tempos), operational characteristics, and beam sizes. The Navy proposes to use two general types of laser systems at DESIL: HELs and Lower Power Lasers such as dazzlers or Target Illumination Lasers (TILs). Typically, Lower Power Lasers (e.g., dazzlers or TILs) use a beam width of approximately 79 inches, whereas a high-energy laser employs a more focused beam with a typical width of approximately 4 to 20 inches. For the purposes of this biological opinion, the Navy assumed a beam width of approximately 8 inches for HELs. This width represents the most likely beam size, which would be used at DESIL.

1. High Energy Lasers:

    a. A HEL is intended to destroy its target by focusing laser energy on a specific point on the target. Maintaining focused energy on a specific point on a target is intended to disable or destroy some aspect of that target. At DESIL, HELs would likely engage a target at a target site for a period of 10 seconds at a time and with an estimated cumulative operating time of 5 minutes in a 24-hour period.

2. Lower Power Lasers:

    a. A dazzler is a Lower Power Laser system that is not intended to destroy a target. Instead, its purpose is to dazzle or “confuse” an imager on an adversary’s surveillance asset. At DESIL, dazzler systems would likely engage a target at a target site for a period of tens of minutes at a time with an estimated cumulative operating time of 30 minutes in a 24-hour period.

    b. High Energy and Lower Power Laser systems might also employ a secondary TIL. The TIL system could likely illuminate a target for a longer period than the HEL or dazzler. In no case would multiple HEL or dazzler systems be used simultaneously.

    c. Lower Power Lasers may use the visual spectrum of light waves whereas the typical HEL uses the infrared spectrum of light waves.

Avoidance and Minimization Measures

The Navy proposes to implement the following measures to reduce effects to the California least tern. The Navy will implement all measures during the proposed actions:

General Measures

1. The Navy will ensure construction does not take place outside of the project footprint.

2. The Navy will equip all target sites with backstops to prevent lasers from shooting past or through a target.

3. The Navy will utilize shielded designs for permanent outdoor lighting to ensure light entering adjacent nesting habitat is minimized. Lights will be shut off if nighttime operations are not occurring.

4. The Navy will ensure that trash collection containers are not located outdoors, and will maintain outdoor areas free of trash to reduce attracting predators or scavengers.

5. A qualified biologist or trained personnel will:

    a. Educate construction personnel about sensitive species and their habitats, identification, required conservation measures, and reporting requirements;

    b. Attend operationally related meetings as needed;

    c. Walk the laser path as soon as operationally feasible if a bird-laser interaction was observed or suspected. The qualified biologist will contact the Navy's Natural Resources staff at NBVC Point Mugu to identify any injured or deceased birds; and

    d. Walk the laser path looking for any birds that may have been affected by laser operations the morning following nighttime operations occurring from May 1 through August 1 during the first year of operations. The Navy will report annual findings involving federally listed species to the Service.

California Least Tern Measures

1. The Navy will ensure that construction occurs between September 1 to February 28, which is outside of the nesting season for the California least tern.

2. Operators will monitor the laser path from the DESIL to each target to ensure that weapons are not fired if and when wildlife (birds) are within the path of a laser. A qualified biologist will evaluate the fidelity of the laser operator's ability to clearly see birds flying through the path of the laser between the DESIL and the laser target site (1.2 miles apart) during first five operations occurring during the California least tern nesting

season.

3. A qualified biologist or trained personnel will:

    a. Monitor the first five HEL and first five Lower Power Laser operations during the California least tern nesting season from May 1 to August 1 in the first year of operations. The qualified biologist will monitor bird activity at the target site area at the closest position that safety allows (or where the most nesting activity is located) to ensure the operator or spotter at the DESIL is able to observe the same activity and confirm the efficacy of communications and monitoring equipment;

    b. Monitor bird behavior when lasers using the visible spectrum of light waves are used near active California least tern nests. Observers will note reactions that may affect incubation behavior. Observations will ideally take place in a low light environment (e.g., during nighttime or evening operations) when lasers would be most visible. During the first year of laser operations, no less than five monitoring sessions will take place during the nesting season from May 1 to August 1;

    c. Conduct regular nesting surveys on the adjacent Holiday Beach and Holiday Salt Panne to locate and track California least tern nests. The Navy will discuss any increase in abandonment of nests with the Service to investigate if it may be related to laser operations. The Navy will include results of biological monitoring in an annual report submitted to the Service;

    d. Walk the laser path near California least tern nesting areas a minimum of once a month during May, June, and July to search for any birds that may have been impacted by laser operations; and

    e. Survey the laser path near California least tern nesting areas after each operational day under the following circumstances:

        i. If 50 or more California least tern nests are detected between Nike Zeus and DESIL (when Nike Zeus site used); and

        ii. If 200 or more California least tern nests are detected between DESIL and L Avenue.

4. The Navy will place a field camera by or at the laser target site during the California least tern nesting season in the first year of operations. The field camera will be focused on areas with the highest concentrations of nesting California least terns. A qualified biologist or trained personnel will review footage to assess if there were any bird/laser interactions.
5. The Navy will ensure that biologists are granted access to beach areas as much as possible during operational periods when lasers are not energized to monitor California least tern nesting activity.

6. The Navy will place trail cameras on active California least tern nests that are closest to the laser's path to monitor behavior during the first five dazzler operations.

ANALYTICAL FRAMEWORK FOR THE JEOPARDY DETERMINATION

Section 7(a)(2) of the Act requires that Federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of listed species. "Jeopardize the continued existence of" means "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species" (50 CFR 402.02).

The jeopardy analysis in this biological opinion relies on four components: (1) the Status of the Species, which describes the current rangewide condition of the California least tern, the factors responsible for that condition, and its survival and recovery needs; (2) the Environmental Baseline, which analyzes the condition of the California least tern in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the California least tern; (3) the Effects of the Action, which determines all consequences to the California least tern caused by the proposed action that are reasonably certain to occur in the action area; and (4) the Cumulative Effects, which evaluates the effects of future, non-Federal activities, that are reasonably certain to occur in the action area, on the California least tern.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed Federal action in the context of the current status of the California least tern, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to reduce appreciably the likelihood of both the survival and recovery of the California least tern in the wild by reducing the reproduction, numbers, and distribution of that species.

STATUS OF THE SPECIES

Legal Status

The Service listed the California least tern as endangered on June 2, 1970 (35 FR 8491 8498). We issued a revised recovery plan for the subspecies in 1985 (Service 1985) and a 5-year status review in 2006 and 2020 (Service 2006a, 2020a). The Service has not designated critical habitat for the subspecies.

Natural History

Foraging Behavior

California least terns forage in nearshore oceans, harbors, marina channels, tidal estuarine channels, and sheltered shallow bays (Atwood and Kelly 1984, pp. 35-36). Adults forage mostly within 2 miles of breeding colonies, and at many sites foraging is primarily in nearshore ocean waters less than 60 feet deep (Service 1985, p. 18). They feed on small fish that they catch by plunging into the water from flight. In a study of fish dropped by California least tern at 10 nesting areas, researchers found 49 species of fish, all individuals less than 1 year old. Northern anchovy (*Engraulis mordax*) and silverside species (Atherinidae) represented 67 percent of the total sample (Atwood and Kelly 1984, p. 38).

Breeding

California least terns are migratory colonial nesters, usually arriving in breeding areas by late April and departing again in August (Massey 1974, pp. 6, 43) and exhibit a high degree of nest site fidelity from year to year. Individuals often return to breed where they previously bred successfully or to their natal sites (i.e., where they hatched) significantly more than would be predicted if birds nested randomly (Atwood and Massey 1988, pp. 391–393). After the initial nesting period that begins on their arrival in April, a second wave of nesting may occur from mid-June to early August. These are mainly re-nests after initial failures and second-year birds nesting for the first time (Massey and Atwood 1981, p. 596).

Nesting California least terns usually occupy a sand-shell beach relatively free of plant growth (Massey 1974, p. 5). The nest is typically a shallow, round depression, constructed by a bird sitting and kicking its feet backwards while rotating its body. This may occur several times before an egg is laid (Massey 1974, pp. 10-11; Wolk 1974, p. 52). Terns may use “sideways building” after scrape construction, which consists of the sitting bird reaching out with its bill to pick up additional nest material, such as small shells and shell fragments, and depositing them into the nest (Wolk 1974, p. 53).

Early in the breeding season, California least terns display night roosting behavior. Prior to incubation, terns will sleep at night at varying distances from the nesting sites. Once incubation begins, birds roost at night on the nest. Terns use roosting sites away from breeding colonies prior to egg laying, apparently for predator avoidance. By not sleeping within the colony until eggs are laid, the terns may delay the colony being discovered by a nocturnal predator by 2 to 3 weeks (Service 1985, p. 7).

California least terns begin incubation after laying the first egg. Both parents participate in incubation, which lasts 20 to 25 days (Massey 1974, pp. 15-16). Clutch size ranges from one to three eggs, with two eggs being most common (Massey 1974, p. 13; Ehrlich et al. 1988, p. 186).

California least tern chicks are semi-precocial (capable of a high degree of independent activity from birth) and are fed small fish by parents within hours of hatching (Massey 1974, p. 17; Ehrlich et al. 1988, p. 18). Chicks will begin leaving the nest in one to two days (Massey 1974, p. 17) and fledge at approximately 20 days. Juveniles and adults will fish, loaf, preen, and roost

together for several weeks after fledging; adults will continue to feed juveniles during this period (Massey 1974, p. 20).

Wintering

California least terns leave nesting areas by August to spend winter months along the west coast of Baja California, the west coast of Mexico, and further south, possibly from the Gulf of California to Guatemala (American Ornithologists' Union (AOU) 1957, p. 239; Service 1985, p. 17; Thompson et al. 1997, Distribution, Migration, and Habitat).

Rangewide Status

The historical breeding range of the California least tern extends along the Pacific coast from central California (Moss Landing) to southern Baja California (San Jose del Cabo). Potentially vagrant birds have been documented further north in Alameda County, California (AOU 1957, p. 239; Grinnell and Miller 1944, p. 175). Since 1970, nesting sites have been recorded from San Francisco Bay to Bahia de San Quintin, Baja California. The nesting range in California has been discontinuous, with the majority of birds nesting in southern California from Santa Barbara County south through San Diego County (Service 1985, p. 3).

In 1969 and 1970, Craig (1971, pp. 1, 5) conducted breeding surveys in San Mateo, Orange, and San Diego Counties. Craig estimated 300 pairs at 15 sites in the three counties and made recommendations to prevent the extirpation of the California least tern in California, principally to protect existing sites from human disturbance and create new sites in areas that could be protected from disturbance and development (Craig 1971). In 1980, 1981, 1982, and 1983, the California least tern breeding population in California was approximately 890-1,215; 963-1,171; 1,015-1,245; and 1,180-1,299 pairs, respectively (Service 1985, p. 21). Fluctuations in the number of breeding pairs and productivity have been attributed to the El Niño Southern Oscillation, which results in limited food availability (Caffrey 1995, p.12; Massey et al. 1992, pp. 982-983; Robinette et al. 2015, pp. 5, 10, 21-52). The effects on California least terns after a severe El Niño event may last several years (Massey et al. 1992, pp. 976, 978, 982).

Surveys have become more standardized and frequent since the 1990s (Frost 2017, p. 5). Frost reported 3,989-4,661 breeding pairs across 42 nesting sites in California over the 2016 breeding season (Frost 2017, p. 3). The majority of breeding activity in California during the 2016 season was concentrated at a few sites: Camp Pendleton, Naval Base Coronado, Batiquitos, Point Mugu, Huntington, and Alameda Point (Frost 2017, p. 11), a trend consistently observed in previous years (Frost 2016, p. 12; 2017, p. 11). These five sites in conjunction with Hayward, Los Angeles Harbor, Huntington, Bolsa Chica, and Oceano Dunes, contributed 88 percent of California's fledgling production. The California Department of Fish and Wildlife provides annual reports of nesting California least terns in California; reports include numbers of breeding pairs, nesting sites, and fledgling to breeding pair ratios. Table 1 compiles nesting pair and breeding site data from 1969 to 1974, and 1990 to 2016.

Table 1. Numbers of breeding pairs and nesting sites across California; data compiled from California Department of Fish and Wildlife Reports (Craig, 1971, p. 1; Bender 1974a, 1974b, p. 1; Johnson and Obst 1992, pp. 3, 6; Obst and Johnson 1992, pp. 3, 5; Caffrey 1993, 1995, 1997, 1998, p. 3, 1994, p.2; Keane 1998, 1999, p. 3, 2001, p. 5; Patton 2002, p. 3; Marschalek 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, p. 3; Frost 2017, 2016, 2015, 2013, p. 3).

Year	*Approximate Number of Breeding Pairs*	*Number of Nesting Sites*
2016	3,989-4,661	42
2015	4,202-5,295	41
2014	4,232-5,786	41
2012	4,293-6,421	41
2011	4,826-6,108	40
2010	6,437-6,699	41
2009	7,130-7,352	41
2008	8,223-8,226	36
2007	6,744-6,989	35
2006	7,006-7,293	31
2005	6,865-7,341	28
2004	6,354-6,805	32
2000	4,521-4,790	37
1999	3,451-3,674	36
1998	4,141-4,182	30
1997	4,017	38
1996	3,330-3,392	35
1995	2,585-2,611	37
1994	2,792	36
1993	2,400	35
1992	2,106	38
1991	1,830	26
1990	1,706	28
1974	582	20
1973	624	19
1969-1970	300	15

Recovery

The primary goals outlined in the 1985 recovery plan are to prevent extinction and return the California least tern population to a stable, non-endangered status. We state that reclassification to threatened status may be considered if 1,200 breeding pairs in California occur in 15 secure management areas with a 3-year mean reproduction rate of 1.0 (one fledgling per breeding pair) (Service 1985, p. 26). We also state that delisting may be considered if the population reaches 1,200 breeding pairs distributed in at least 20 of 23 coastal management areas with the following provisions:

1) Sufficient habitat to support at least one viable colony (consisting of a minimum of 20 breeding pairs with a 5-year mean reproductive rate of at least 1.0 young fledged per year, per breeding pair) at each of the 20 coastal management areas that are managed to conserve least terns (which must include San Francisco Bay, Mission Bay, and San Diego

Bay); and

2) Assured land ownership and management objectives for future habitat management for the benefit of California least terns, and the security and status of Baja California colonies are assessed for incorporation into recovery objectives (Service 1985, pp. 25-26).

The breeding population of California least terns currently exceeds Objective 1. The estimated number of California least tern breeding pairs has increased from approximately 624 pairs in 1973 to a peak of approximately 7,100 pairs in 2009. The number of breeding pairs has dropped in the past few years from the peak to estimates of 3,989 pairs in 2016 and 4,095 pairs in 2017. In the 2006 5-year Review, we acknowledged the subspecies had far exceeded this population objective (Service 2006a, p. 3).

Objective 3 does not identify explicitly specific threats to be alleviated but is a proxy for whether threats to reproduction and fecundity are being reduced. In the 2006 5-year review, we concluded that based on the population data at that time, the subspecies could likely be considered recovered without meeting this goal (Service 2006a, p. 5), as the sharp growth in pairs had occurred while estimated fledgling rates were below 1.0 fledglings per pair. This definition of viability is the same for what is required for secure nesting sites in Objective 2, though it is unclear from the recovery criteria if this level of viability must be maintained for 3 or 5 years (Service 1985, pp. 25-26).

Overall, progress is being made toward satisfying the recovery criteria. However, as we concluded in the 2006 5-year review and based on recent data, the recovery plan should be revised and updated to provide threats-based recovery criteria and address the other shortcomings of the recovery plan. Areas of the plan that need updating include inclusion of Mexico populations of California least terns, further analysis of the fledgling per pair ratio, and future impacts from a changing climate, such as seal level rise (Service 2020a, p 62).

In the five-factor analysis in our 2020 5-year status review, we found that rising sea levels as a result of climate change (Factor A), may in the future pose a substantial threat to nesting habitat of the California least tern; that predation (Factor C), continues to threaten the California least tern, (this threat is reduced, though not eliminated, by predator management conducted at the majority of active colonies, and predator management is confounded when the predator is a protected species); that food availability (Factor E) poses a threat to California least terns, though its impact varies from year to year with an uncertain overall magnitude; and cumulative impacts of food availability, predation, and destruction of nesting habitat together pose a substantial threat to the persistence of the California least tern, although management at a majority of the U.S. nesting sites helps to reduce the impact of these combined threats. Though there are few data available on nesting areas in Mexico, lack of legal protection and conservation measures result in a higher degree of threats attributable for nesting California least terns than in the United States (Service 2020a, p. 69).
While the California least tern has met the population size recommended in the recovery plan for downlisting, the population has been recently declining, exhibited poor reproductive success,

and, multiple ongoing threats continue to impact the subspecies. Therefore, we determined that current information does not support reclassifying the California least tern at this time. Additional information on threats, management techniques, and current population models should be obtained before reassessing the taxon again in the future (Service 2020a, p. 70).

ENVIRONMENTAL BASELINE

The implementing regulations for section 7(a)(2) (50 CFR 402.02) define the environmental baseline as "the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline."

Action Area

The implementing regulations for section 7(a)(2) of the Act (50 CFR 402.02) define the "action area" as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. The action area for this biological opinion is a 500-foot buffer around the construction site of the proposed L Avenue laser target site and a 164-foot buffer around the trajectory of lasers that would be projected from the DESIL to the land-based laser target sites. A map of the action area is provided in Figure 3-1 of the biological assessment (Navy 2020a, p. 12) and reproduced below:

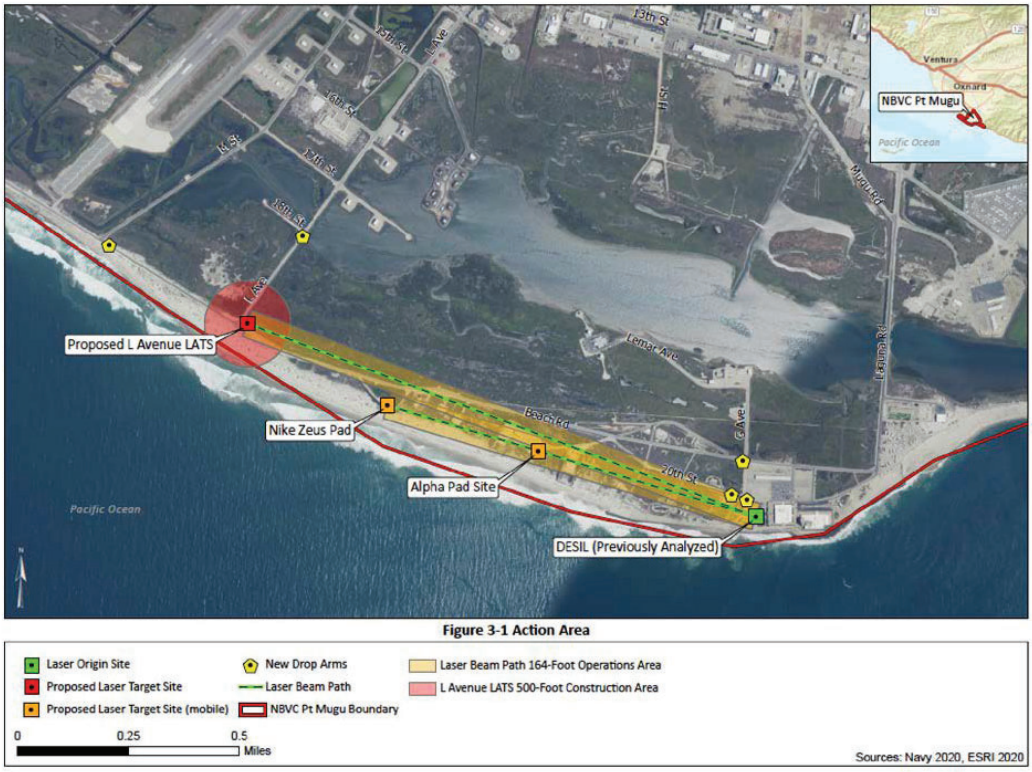


Figure 3-1 Action Area

Previous Consultations in the Action Area

On December 20, 2006, the Service provided the Navy with a biological opinion to cover activities associated with the Bird/Animal Air Strike Hazard Program (1-8-06-F-13) (Service 2006b). The Service concluded that the proposed program was not likely to jeopardize the continued existence of the salt marsh bird's-beak (*Cordylanthus maritimus maritimus*), California least tern, light-footed Ridgway's rail, or western snowy plover. On October 4, 2013, the Navy requested reinitiation of formal consultation in order to expand the project area to include an area not covered in the original biological opinion, which was provided by the Service on July 22, 2014 (08EVEN00-2014-F-0019) (Service 2014a). The Service concluded that the proposed program was not likely to jeopardize the continued existence of the salt marsh bird's-beak, California least tern, light-footed Ridgway's rail, or the western snowy plover.

On March 20, 2014, the Service issued a biological opinion to the Navy to cover activities related to Countermeasures Testing and Training (08EVEN00-2013-F-0475) (Service 2014b). The Service concluded that the proposed program was not likely to jeopardize the continued existence of the California least tern, light-footed Ridgway's rail, or western snowy plover.

On September 25, 2015, the Service issued a biological opinion to the Navy for ongoing activities at NBVC Point Mugu and their effects on salt marsh bird's-beak, California least tern, light-footed Ridgway's rail, and western snowy plover (08EVEN00-2015-F-0074) (Service 2015). The Service concluded that the proposed program was not likely to jeopardize the

continued existence of the salt marsh bird's-beak, California least tern, light-footed Ridgway's rail, or western snowy plover. On October 5, 2015, the Navy requested reinitiation of formal consultation to include the use of unmanned aerial vehicles to conduct California least tern and western snowy plover nest surveys at NBVC Point Mugu, which was provided by the Service on March 24, 2016 (08EVEN00-2016-F-0080) (Service 2016). The Service concluded that the proposed program was not likely to jeopardize the continued existence of the California least tern, light-footed Ridgway's rail, or western snowy plover

Habitat Characteristics of the Action Area

The action area consists of wetlands, beaches, coastal dunes and bluffs, and disturbed and developed areas (Navy 2020a, p. 14). Beaches provide nesting habitat for California least terns. Disturbed and developed areas include buildings; surfaces such as roads, parking lots and sidewalks; and areas where vegetation has been heavily disturbed or eliminated from activities such as vehicular use (Navy 2020a, p. 15). The Nike Zeus Pad is situated on previously developed and disturbed habitats that are adjacent to California least tern breeding habitat.

Condition (Status) of the Species in the Action Area

California least terns nest on the approximately 1.2-mile stretch of Holiday Beach between the DESIL and the proposed L Avenue laser target site building and on the Holiday Salt Panne approximately 300 feet northwest of the proposed laser target site building. The Nike Zeus Pad and Alpha Pad are also located on Holiday Beach between the DESIL and the proposed laser target site building. California least terns mostly breed west of Nike Zeus Pad, and occasionally forage in adjacent open water areas within Mugu Estuary.

California least terns are present at NBVC Point Mugu generally between April and mid-September, and breed from mid-April through mid-August. The Navy documented an average of 106 nests on Holiday Beach from 2005 to 2019, with a high of 278 nests in 2015 to a low of 31 nests in 2011 (Navy 2020a, p. 19). The Navy also recorded two to 34 nests annually on the Holiday Salt Panne since 2007. Over the last 5 years, an average of 46 percent of California least tern nests on NBVC have been on Holiday Beach and the Holiday Salt Panne (Navy 2020a, p. 19).

The location of the proposed L Avenue laser target site building and laser operations are within or adjacent to habitat regularly used by California least tern for breeding and non-breeding activities (Navy 2020a, p. 14). Between May 1 and July 30, 2020, the Navy recorded 1,106 observations of California least terns during surveys at seven point count stations within the Holiday Beach portion of the action area (Navy 2020a, p. 22). Numbers of nesting California least terns were lower in 2020 in comparison to other years. Most of the California least terns were observed flying along the coastline and not crossing the proposed laser path (east to west lines from DESIL to the L Avenue laser target site bisecting the avian point count stations). These survey results show that the heaviest concentrations of California least terns were observed flying between the L Avenue laser target site and the Nike Zeus Pad (Navy 2020a, p. 22). For more details on the most recent status of the California least tern refer to NBVC Point

Mugu 2019 Listed Species and Biological Opinion Comprehensive Monitoring Report (Navy 2020b).

Recovery

NBVC Point Mugu is within Management Area F: Mugu Lagoon (Service 1985, p. 13). Mugu Lagoon provides both breeding and dispersal habitat and is identified in the recovery plan under the following tasks:

1. Develop and implement management plans/programs for secure nesting habitat in five northern counties; and

2. Protect existing coastal feeding grounds of colonies.

In the 2020 5-year status review for California least tern, we describe NBVC Point Mugu as a secure and managed site with a minimum of 20 breeding pairs within the north Southern California Bight region with suitable and occupied habitat and threats of rising sea levels, predation, and food availability. In 2016, breeding pairs at NBVC Point Mugu accounted for 8 percent of breeding pairs in the range with a minimum of 315 breeding pairs and 361 nests. In 2017, the Navy reported a minimum of 262 breeding pairs with a min-max fledglings per pair ratio of 0.09-0.19 (Service 2020, pp. 17, 25, 49, 96-97). NBVC Point Mugu contains one of the five largest breeding colonies of California least terns in the range (Service 2006a, p. 3; 2020, p. 9). Mugu Lagoon may also contribute to the recovery of California least tern through climate resiliency; the nesting habitat at NBVC Point Mugu is projected to be only minimally affected by sea level rise under various scenarios (Service 2020, pp. 109, 112).

EFFECTS OF THE ACTION

The implementing regulations for section 7(a)(2) define effects of the action as “all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action” (50 CFR 402.02).

In conducting this analysis, we have considered factors such as previous consultations; Federal Register rules; 5-year reviews; other Service documents; published scientific studies and literature; professional expertise of Service personnel, particularly dealing with aspects directly related to the sensitive species involved, or other related scientific fields in determining whether effects are reasonably certain to occur. We have also determined that certain consequences are not caused by the proposed action, such as the increase or spread of disease, poaching, and/or collecting,

because they are so remote in time, or geographically remote, or separated by a lengthy causal chain, so as to make those consequence not reasonably certain to occur.

Effects of the Proposed Action on the California Least Tern

Construction

Noise would occur during construction of the L Avenue laser target site building. This noise could disturb California least terns, resulting in disruption of breeding behavior or nest abandonment. We do not anticipate adverse effects from construction to the California least tern because the Navy proposes to schedule construction outside of the breeding season when California least terns are not present.

Operations

Though effects of direct contact between HEL beams and wildlife are not fully known, HEL operations could injure or kill California least terns that cross the beam. However, the likelihood of a bird-beam interaction occurring is very low. The typical diameter of a HEL used during the proposed activity would be a maximum of 7.87 inches, and the distance from the origination of the laser at the DESIL building to the target site ranges from 0.51 mile (to Alpha Pad) to 1.19 miles to the proposed laser target site building. The maximum area that could be affected would be approximately 1,289 cubic feet considering the length of the laser's path and the diameter of the beam. This area would only be hazardous to flying birds when the HEL is energized (34 hours per year). The hazardous area would represent a small portion of the total California state range of the California least tern, which encompasses about 497 linear miles from San Francisco to Baja, Mexico, and only 0.58 percent of the total time during which California least terns are present in the action area, based on the proposed cumulative operation time and the subspecies' migration. The Navy would also position a camera or observer(s) at target sites, and an observer at the DESIL, to ensure that a distance of 164 feet around the laser path is clear of wildlife prior to beginning a test event. Taken together, the measures proposed by the Navy would minimize effects of HEL operation on the California least tern. The combination of small spatial and temporal overlap between proposed HEL operations and any California least tern, along with minimization measures proposed by the Navy, results in a low likelihood of effect to any individual.

The Navy developed a simple model which incorporated California least tern flight behavior, laser geometry, nesting bird density, and testing frequency to calculate the number of birds that may likely come into contact with the HEL during testing (Navy 2020c). This model predicts 1 (rounded up from 0.27) exposure per year based on a 41 nesting pairs which could potentially be exposed (i.e., California least terns nesting at Point Mugu) (Navy 2020c, p. 8). The model used the L Avenue location for determining laser geometry as this site has the longest pathway and therefore the largest potential exposure area. Additionally, the model does not take into account potential reductions in exposures as a result of the Navy's proposed avoidance and minimization measures.

Though effects of direct contact between Lower Power Lasers and wildlife are not fully known, Lower Power Laser operations could cause temporary flash blindness and disorientation to adult California least terns that fly through the laser. The Navy would minimize effects of Lower Power Laser operations by positioning a camera or observer(s) at target sites, and an observer at the DESIL, to ensure that a distance of 164 feet around the laser path is clear of wildlife prior to beginning a test event.

Visual disturbance from Lower Power Laser operation during the breeding season could interrupt courtship or breeding activities, or elicit a startle response that causes adult California least terns to flush from the nest. Startle responses during nesting may result in nest abandonment or dislodging of eggs from nest scrapes. Unattended California least tern eggs and chicks are more susceptible to the elements and predation; thus, eggs or chicks could be depredated or die of exposure if adult birds flush from the nest in response to Lower Power Laser operations, and eggs and chicks are unlikely to survive if adults do not return to the nest. The Navy would minimize these effects by operating Lower Power Lasers for no more than 30 minutes in a 24-hour period, and cumulative laser operations are not anticipated to exceed 34 hours per year. Additionally, lasers directed to the L Avenue laser target site would likely be an average of 250 feet away from most nesting terns, which may be far enough away that a laser would not elicit a response (Navy 2020a, p. 30). While the circumference of Low Power Lasers is larger than HELs, the total volume of the area affected would be small. The Navy will further understand these effects by monitoring California least terns during and after operations.

Visual disturbance from Lower Power Laser operation could interrupt foraging activities; however, we expect these effects will be minimal due to the short duration of disturbance and distance from the laser path to foraging California least terns. The Navy will further understand these effects by monitoring California least terns during and after operations.

Because the Navy anticipates no greater than 34 hours of laser operations per year, it is possible that some operations may occur when California least terns are not present, and no operations-related effects would occur.

Effects on Recovery

The proposed project would have a minor, if any, effect on the likelihood of recovery in the Mugu Lagoon Management Unit because, in a typical year, less than half of California least tern nests at NBVC occur on Holiday Beach, and fewer still nest in proximity to the laser's path (average distance of 250 feet) (Navy 2020a, p. 33). Combined with the low tempo of laser operations (i.e., less than 34 cumulative hours annually), the Navy's proposed avoidance and minimization measures, and the relatively small hazard area, we do not expect an appreciable likelihood that more than a very small number of California least terns would be affected by laser operations; thus, the Service's ability to recover the subspecies in the Mugu Lagoon Management Unit would not be appreciably reduced. In addition, we anticipate that California least terns in the action area will remain secure and managed with stable numbers and reproductive success in suitable and occupied habitat. NBVC Point Mugu, being a military

installation, is likely to continue to benefit California least terns as part of their Integrated Natural Resource Management Plan. Based on these factors, we anticipate that any adverse effects from the proposed action would not diminish the ongoing contributions of NBVC Point Mugu to California least tern recovery.

Summary of Effects

In summary, while project activities (laser operations) are likely to adversely affect California least tern, we expect the effects to be minimal. At minimum, visual disturbance when Lower Power Laser operations occur during the breeding season may result in short-term adverse effects including interruption of courtship or breeding activities, flushing from nests, or interruption of foraging behavior. At worst, direct contact with a laser beam by California least could result in disorientation or temporary blindness (Lower Power Laser), or injury or mortality (HEL); however, the effects of direct contact between lasers and wildlife are not fully known, and the likelihood of direct contact is low.

Given the Navy's proposed minimization measures and the low spatial and temporal overlap between the proposed activities and California least terns, we expect that effects to the subspecies would be minimal. We do not expect that many, if any, California least terns would be injured or killed by project activities or that the proposed project would have a substantial effect on the NBVC Point Mugupopulation. The project would not alter habitat, nor would the project appreciably affect the recovery of California least tern locally or rangewide.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. We do not consider future Federal actions that are unrelated to the proposed action in this section because they require separate consultation pursuant to section 7 of the Act. We are not aware of any non-Federal actions that are reasonably certain to occur in the action area.

CONCLUSION

The regulatory definition of "to jeopardize the continued existence of the species" focuses on assessing the effects of the proposed action on the reproduction, numbers, and distribution, and their effect on the survival and recovery of the species being considered in the biological opinion. For that reason, we have used those aspects of the California least tern's status as the basis to assess the overall effect of the proposed action on the subspecies.

Reproduction

The proposed project may temporarily reduce the amount of breeding in the action area if California least terns avoid nesting or if courtship or breeding activities are interrupted near the laser path due to visual disturbance. The Navy would monitor California least tern nests to document these effects, if they occur. Any such reduction in habitat would be small and would not appreciably diminish the reproductive capacity of California least terns locally or rangewide.

Numbers

The proposed activities may contribute to the injury or mortality of individual California least tern eggs, chicks, or adults during the breeding season; however, based on the tendency of California least terns to re-nest during the breeding season, these losses, if they occur, may not be measurable and/or would represent a very small portion of California least tern numbers over time. Though some injury or mortality of adult California least terns could occur during HEL operations, we expect such injury and mortality to be very infrequent due to the measures the Navy will implement to avoid and minimize effects during laser operations. Therefore, we expect that loss of the small number of individuals, if any, which may occur during the proposed project would not appreciably reduce the numbers of California least tern locally or rangewide.

Distribution

To reduce a species' range, an action would have to eliminate habitat for the species or permanently displace individuals from currently occupied habitat. We do not expect this project to affect distribution of the California least tern because this project would not permanently alter habitat. Though there may be some mortality, we do not expect an appreciable reduction in numbers to the point where this locality is extirpated. Therefore, we anticipate that effects to the distribution of the California least tern will be minimal.

Recovery

The recovery plan for the California least tern identifies Mugu Lagoon as important for breeding, foraging and dispersal. As described in the Effects of the Action section, the proposed project has been designed to minimize effects to the subspecies by implementing a suite of avoidance and minimization measures. We have determined that effects to both individual California least terns and the subspecies' habitat would not be substantial on either a local or rangewide basis; thus, the proposed action would not appreciably diminish the subspecies' likelihood of recovery.

Conclusion

After reviewing the current status of California least tern, the environmental baseline for the action area, the effects of the proposed project and the cumulative effects, it is the Service's biological opinion that the project, as proposed, is not likely to jeopardize the continued existence of the California least tern because:

1. The project would not appreciably reduce reproduction of the subspecies either locally or rangewide.

2. The project would affect a very small number of individuals, if any, and would not appreciably reduce numbers of the subspecies locally or rangewide.

3. The project would not reduce the subspecies' distribution either locally or rangewide.

4. The project would not cause any effects that would preclude our ability to recover the subspecies.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened wildlife species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not the purpose of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement.

AMOUNT OR EXTENT OF TAKE

We anticipate that some California least terns could be taken as a result of the proposed action. We expect the incidental take to be in the form of injury or death as a result of project activities if individuals cross the path of the laser beam, or if nest contents (eggs or chicks) are injured, depredated, or abandoned due to visual disturbance from Lower Power Lasers.

While we cannot quantify the precise number of California least terns that may be taken as a result of the action that the Navy has proposed because the breeding population fluctuates annually, we can use the Navy-developed model to estimate potential exposures of California least terns to HEL activities (Navy 2020c). Operations would also occur during a short timeframe (34 cumulative hours annually) throughout the year; thus, operations may occur outside the breeding season when individuals are not present in the action area. California least tern numbers also widely vary year to year. Though detecting take of foraging birds would be difficult without direct observation (e.g., due to erratic flight or other variables causing California least terns to flush or fly off), the Navy has agreed to extensive monitoring during testing, which includes line-of-sight between the laser emitter and the target. The protective measures proposed by the Navy are likely to prevent mortality or injury of most individuals. The Environmental Baseline and Effects Analysis sections of this biological opinion indicate that adverse effects to California least tern would likely be low given the nature of the proposed

activities, and we, therefore, anticipate that take of California least tern would also be low. We used the Navy-developed model (Navy 2020c), rounding exposures (contact) per year to the nearest whole number, to estimate an amount of take which is reasonably likely to occur due to HEL exposure. As described in the Effects Analysis, assuming 41 nesting pairs are present, we anticipate 1 exposure (rounded from 0.27) annually. We recognize that 41 nesting pairs is lower than the annual average (from 2004 to 2019) of 106 nests, that the number of nesting pairs fluctuates annually, and that changes in the number of pairs may not result in a linear increase or decrease in exposures estimated by the Navy's model; however, even a large increase in pairs is unlikely to result in more than one exposure annually because of the Navy's proposed avoidance and minimization measures, which the model did not account for.

Therefore, during any 2-year period if, as a result of project activities, three (3) breeding adult California least terns are injured or killed, four (4) eggs are damaged or abandoned (from one or more nests), or four (4) chicks are abandoned, killed, or injured (from one or more nests), the Navy must contact our office immediately to reinitiate formal consultation. Project activities that are likely to cause additional take should cease as the exemption provided pursuant to section 7(o)(2) may lapse and any further take could be a violation of section 4(d) or 9.

REASONABLE AND PRUDENT MEASURE

The measure described below is non-discretionary, and must be undertaken by the Navy for the exemption in section 7(o)(2) to apply. The Navy has a continuing duty to regulate the activity covered by this incidental take statement. If the Navy (1) fails to assume and implement the terms and condition or (2) fails to adhere to the terms and condition of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the Navy must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR 402.14(i)(3)].

The Service believes the following reasonable and prudent measure is necessary and appropriate to minimize the impacts of the incidental take of California least tern:

Biologists must be authorized by the Service before they survey for California least terns.

TERMS AND CONDITION

To be exempt from the prohibitions of section 9 of the Act, the Navy must comply with the following term and condition, which implements the reasonable and prudent measure described above and outline reporting and monitoring requirements. This term and condition is non-discretionary:

> The Navy must request our approval of any biologists that they or their contractors employ to conduct project activities associated with the California least tern pursuant to this biological opinion. Such requests must be in writing and be received by the Ventura Fish and Wildlife Office at least 30 days prior to any such activities being conducted. Please be advised that possession of a 10(a)(1)(A) permit for the California least tern does not substitute for the implementation of this measure. Authorization of Service-approved biologists is valid for this project only.

REPORTING REQUIREMENTS

Pursuant to 50 CFR 402.14(i)(3), the Navy must report the progress of the action and its impact on the species to the Service as specified in this incidental take statement. The Navy must submit a written report due by January 30 for each fiscal year (October to September) that activities are conducted pursuant to this biological opinion. The annual report must include: documentation of the impacts of the proposed activities on California least tern; results of biological surveys and observation records; documentation of the number of individual California least terns injured or killed; the date, time, and location of any form of take; approximate size and age of those individuals taken; and a description of relocation sites or rehabilitation outcomes for injured individuals. The report should also include a discussion of any problems encountered implementing the term and condition and other protective measures, recommendations for modifying the terms and conditions to enhance the conservation of federally listed species, and any other pertinent information. These reports will assist us in evaluating future measures for the protection of federally listed species in the action area. As part of the annual report, the Navy must identify population trends and possible causes for any trends indicating declines that may result from cumulative effects of multiple laser operations.

DISPOSITION OF DEAD OR INJURED SPECIMENS

As part of this incidental take statement and pursuant to 50 CFR 402.14(i)(1)(v), upon locating a dead or injured California least tern, initial notification within 3 working days of its finding must be made by telephone and in writing to the Ventura Fish and Wildlife Office (805-644-1766). The report must include the date, time, location of the carcass, a photograph, cause of death or injury, if known, and any other pertinent information.

The Navy must take care in handling injured animals to ensure effective treatment and care, and in handling dead specimens to preserve biological material in the best possible state. The Navy

must transport injured animals to a qualified veterinarian. Should any treated California least tern survive, the Navy must contact the Service regarding the final disposition of the animal(s).

The remains of California least terns must be placed with educational or research institutions holding the appropriate State and Federal permits, such as the Western Foundation of Vertebrate Zoology (Contact: Linnea S. Hall, Ph.D., Executive Director, Western Foundation of Vertebrate Zoology, 439 Calle San Pablo Camarillo, CA 93012, (805) 388-9944) or Santa Barbara Natural History Museum (Contact: Paul Collins, Santa Barbara Natural History Museum, Vertebrate Zoology Department, 2559 Puesta Del Sol, Santa Barbara, California 93460, (805) 682-4711, extension 321).

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

> We recommend the Navy work with research institutions to investigate effects of laser operations on California least terns and other wildlife.

The Service requests notification of the implementation of any conservation recommendations so we may be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats.

REINITIATION NOTICE

This concludes formal consultation on the action(s) outlined in the request. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, the exemption issued pursuant to section 7(o)(2) may have lapsed and any further take could be a violation of section 4(d) or 9. Consequently, we recommend that any operations causing such take cease pending reinitiation.

If you have any questions about this biological opinion, please contact David Sherer of my staff at (805) 644-3338, or by electronic mail at david_sherer@fws.gov.

Sincerely,

STEPHEN HENRY Digitally signed by STEPHEN HENRY
Date: 2021.04.16 09:07:00 -07'00'

Stephen P. Henry,
Field Supervisor

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