

Environmental Impact Statement/ Overseas Environmental Impact Statement

Point Mugu Sea Range

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2 Description of Proposed Action and Alternatives

This chapter provides detailed information on the Proposed Action and alternatives that are analyzed in this Environmental Impact Statement (EIS)/Overseas EIS (OEIS). In addition to conducting current testing and selected training activities at the Naval Air Warfare Center Weapons Division (NAWCWD) Point Mugu Sea Range (PMSR), NAWCWD Point Mugu proposes to introduce increases in annual activities and tempo.

2.1 Point Mugu Sea Range Overview

The Navy has been conducting testing and training activities in the PMSR Study Area since the PMSR was established in 1946. Testing activities are deemed necessary to accomplish Naval Air Systems Command's (NAVAIR's) mission of providing for the safe and secure collection of decision quality data; and developing, operating, managing, and sustaining the interoperability of the Major Range Test Facility Base (MRTFB) at the PMSR into the foreseeable future. As a MRTFB, PMSR supports test and evaluation of a wide variety of weapons, ships, aircraft and specialized systems. PMSR serves a broad spectrum of Department of Defense, Homeland Defense, and commercial/private sector programs. International partners and organizations occasionally utilize the PMSR as part of Foreign Military Sales (FMS), authorized by the Arms Export Control Act, as amended [22 United States Code 2751, et. seq.], which is the U.S. Government's program for transferring defense articles, services, and training to our international partners and international organizations. FMS activities account for less than 5 percent of all test and evaluation activities that occur annually on the PMSR. FMS activity type on PMSR falls within the Primary Mission Areas described below in Section 2.1.1 (Primary Mission Areas).

The types and tempo of testing and training activities have fluctuated over time because of the introduction of new technologies, the evolving nature of international events, advances in warfighting doctrine and procedures, and changes in force structure (e.g., organization of ships, submarines, aircraft, and weapons). Such developments influence the frequency, duration, intensity, and location of required testing and training activities. Most of the factors influencing frequency and types of activities are fluid in nature (i.e., continually evolving and changing), and the PMSR activity level will continue to fluctuate in the future. Projecting future testing activities' duration and frequency varies depending on Fleet requirements and funding. Future testing depends on scientific and technological developments that are not easy to predict, and experimental designs may evolve with emerging science and technology. Even with these challenges, the Navy makes every effort to forecast all future testing requirements. As a result, testing requirements are driven by the need to support Fleet readiness based on emerging national security interests, and alternatives must have sufficient annual capacity to conduct the research, development, and testing of new systems and technologies, with upgrades, repairs, and maintenance of existing systems.

Training prepares Navy personnel to be proficient in operating and maintaining the equipment, weapons, and systems they will use to conduct their assigned missions. The training process provides personnel with an in-depth understanding of their individual limits and capabilities; it also helps the testing community improve new weapon systems' capabilities and effectiveness. Training on the PMSR typically occurs in conjunction with weapons testing to provide Fleet operators unique opportunities to train with ship and aircraft combat weapon systems and personnel in scripted warfare environments, including live-fire events. For example, Fleet training could occur while testing a weapon system, in which Sailors would experience (be trained in) the use of the system being tested.

Number of and types of systems involved in testing and training events at PMSR has evolved since development of the 2002 EIS/OEIS. Generally, changes are a result of new technological advances in software/hardware modifications or capabilities (e.g., speed and precision) and do not change the level of environmental impacts; thus, the impacts remain similar to the 2002 EIS/OEIS. The accelerated introduction of new technologies underscores the importance of sustained testing activity at the PMSR, as new weapons and systems being developed are projected to be used on most or all of the current and future combat platforms. Since 2002, additional National Environmental Policy Act (NEPA) analysis has been conducted to address changing mission requirements. The objective of this EIS/OEIS is to carry forward the current operations needed to complete the NAVAIR mission, as well as analyze new future requirements that have been identified. Current capabilities are captured in previous NEPA documentation, and analysis from these activities will be incorporated by reference and updated if applicable. In addition, this EIS/OEIS looks at future needs and requirements, and includes new analysis. Details on the Proposed Action, which is inclusive of both relevant current and projected future mission requirements, are outlined in Section 2.2 (Proposed Action). A list of key documents that cover existing range operations and supporting facilities are listed in Section 1.7.4 (Related Environmental Documents), and these documents are incorporated by reference where applicable.

2.1.1 Primary Mission Areas

The military builds upon the purpose and need to train and test (as described in Chapter 1) by describing the Study Area and identifying the primary mission areas for which these training and testing activities are conducted. Each warfare community (e.g., aviation, surface, submarine, and expeditionary) conducts training and testing activities that contribute to the success of these primary mission areas. Each primary mission area requires unique skills, sensors, weapons, and technologies to accomplish the overall mission.

The Navy categorizes its at-sea activities into eight functional warfare areas called primary mission areas. PMSR activities addressed in this EIS/OEIS are categorized under three of those primary mission areas. Within the primary mission areas, there are more specific categories that reflect testing and training activities included in the Proposed Action (refer to Appendix A, PMSR Scenario Descriptions).

- air warfare (air-to-air, surface-to-air)
- electronic warfare (directed energy - airborne electronic detection and countermeasure systems, lasers and high-powered microwave systems)
- surface warfare (surface-to-surface, air-to-surface, and subsurface-to-surface)

Research, Development, Acquisition, Testing, and Evaluation of new technologies by the U.S. Department of Defense occurs continually to ensure that the U.S. military can counter new and anticipated threats. All new Navy systems and related equipment must be tested to ensure proper functioning before delivery to the Fleet for use. The PMSR is the Navy's primary ocean testing area for guided missiles and related ordnance. Test operations on the Sea Range are conducted under highly controlled conditions, allowing for the collection of empirical data to evaluate the performance of a weapon system or subsystem. Testing conducted in the PMSR is important for maintaining readiness. Two of the U.S. Navy's Systems Commands, Naval Sea Systems Command (NAVSEA) and NAVAIR, sponsor the majority of the testing at PMSR. NAVSEA's five affiliated Program Executive Offices (PEOs) oversee over a dozen Program Manager, Sea offices that sponsor testing activities at PMSR. NAVAIR's

four affiliated PEOs, along with NAVAIR Headquarters-managed programs, oversee approximately 20 Program Managers and Air offices that also sponsor testing activities at PMSR.

A frequent test conducted at the PMSR are the NAVSEA Combat Systems Ship Qualification Trials (CSSQT). This is a series of comprehensive tests and trials designed to show that the equipment and systems included in the CSSQT program meet combat system requirements. Live and inert weapons, along with chaff, flares, jammers, and lasers, may be used. CSSQTs are conducted within the primary warfare mission areas discussed above.

Weapons testing may contain both flight and surface elements (target, weapon, launch aircraft or vessel, or range support aircraft). Fixed-wing and rotary-wing aircraft, including both manned and unmanned systems, also conduct weapons tests. Tests may be captive carry (i.e., the weapon is not released from the aircraft) or involve the release of ordnance or other expendables, including non-explosive and telemetry (TM)-only warheads and live fire munition rounds. Chaff or flares may be used during weapons tests, with the restriction that they are expended offshore in compliance with environmental regulations.

Training conducted in parallel with testing activities provide Fleet operators unique opportunities to train with ship and aircraft combat weapon systems and personnel in scripted warfare environments, including live-fire exercises. Combat ship crews train in conjunction with scheduled NAVSEA ship testing and qualification trials, to take advantage of the opportunity to provide concurrent training and familiarization for ship personnel in maintaining and operating installed equipment, identifying design problems, and determining deficiencies in support elements (e.g., documentation, logistics, test equipment, or training).

Typically concurrent with testing, surface training available on the PMSR includes tracking exercises, missile-firing exercises, gun-firing exercises, high-speed anti-radiation missile exercises, and shipboard self-defense system training, (e.g., Phalanx [Close-in Weapons System], Rolling Airframe Missile, and Evolved Sea Sparrow Missile). Training events can be limited in scope and focus on one or two tasks or can be more complex occurring over multiple days. Missiles may be fired against sub-sonic and supersonic targets. Certain training events designed for single ships are conducted to utilize unique targets only available for training at the PMSR.

Aviation warfare training conducted at PMSR, categorized as unit level training, is designed for a small number of aircraft up to a squadron of aircraft. These training events occur at PMSR as it is the only West Coast Navy venue to provide powered air-to-air targets. These scenarios require planning and coordination to ensure safe and effective training.

2.1.1.1 Air Warfare

The mission of air warfare is to destroy or reduce enemy air and missile threats (including unmanned airborne threats) and serves two purposes: to protect U.S. forces from attacks from the air and to gain air superiority. Air warfare provides U.S. forces with adequate attack warnings, while denying hostile forces the ability to gather intelligence about U.S. forces.

Aircraft conduct air warfare through radar search, detection, identification, and engagement of airborne threats. Surface ships conduct air warfare through an array of modern anti-aircraft weapon systems such as aircraft-detecting radar, naval guns linked to radar-directed fire-control systems, surface-to-air missile systems, and radar-controlled guns for close-in point defense.

Testing of air warfare systems is required to ensure the equipment is fully functional under the conditions in which it will be used. Tests may be conducted on radar and other early-warning detection and tracking systems, new guns or gun rounds, and missiles. Testing of these systems may be conducted on new ships and aircraft, and on existing ships and aircraft following maintenance, repair, or modification. For some systems, tests are conducted periodically to assess operability. Additionally, tests may be conducted in support of scientific research to assess new and emerging technologies.

2.1.1.1.1 Air-to-Air

Air-to-air scenarios involve the employment of an airborne weapon system against airborne targets. Missiles are fired from a fighter aircraft for both testing and training events. Range support includes range clearance, instrumentation, aerial target presentation and recovery, TM, and surveillance aircraft. The missiles are highly instrumented to record the intercept parameters and normally do not carry live warheads. However, the scenarios may require captive carry (inert), live motor but no warhead, or tactical full-capability rounds for firing and warhead detonation. The airborne targets are usually not destroyed and are recovered by boat or helicopter from the water for subsequent use.

2.1.1.1.2 Surface-to-Air

Surface-to-air scenarios evaluate the overall weapon system performance, warhead effectiveness, and software/hardware modifications or upgrades of ground-based and ship-based weapons systems. Missiles are fired from a ship or a land-based launcher against a variety of supersonic and subsonic airborne targets. Under this scenario, airborne targets can be launched from ground-based launchers, ships, or aircraft. The missiles are highly instrumented to record the intercept parameters and normally do not carry live warheads. Range support includes range clearance, instrumentation, aerial target presentation, TM and surveillance aircraft, and other related range support. These scenarios may include use of conventional ordnance for inert warheads or tactical full-capability rounds for firing and warhead detonation.

2.1.1.2 Electronic Warfare

The mission of electronic warfare is to degrade the enemy's ability to use electronic systems, such as communication systems and radar, and to confuse or deny them the ability to defend their forces and assets. Electronic warfare is also used to detect enemy threats and counter their attempts to degrade the electronic capabilities of the Navy.

Typical electronic warfare activities include threat avoidance training, signals analysis for intelligence purposes, and use of airborne and surface electronic jamming devices (that block or interfere with other devices) to defeat tracking, navigation, and communications systems.

Testing of electronic warfare systems is conducted to improve the capabilities of systems and ensure compatibility with new systems. Testing involves the use of aircraft, surface ships, and submarine crews to evaluate the effectiveness of electronic systems. Similar to training activities, typical electronic warfare testing activities include the use of airborne and surface electronic jamming devices (including testing chaff and flares; see Appendix A (PMSR Scenario Descriptions) for a description of these devices) to defeat tracking and communications systems. Chaff tests evaluate newly developed or enhanced chaff, chaff dispensing equipment, or modified aircraft systems' use against chaff deployment. Flare tests evaluate deployment performance and crew competency with newly developed or enhanced flares, flare dispensing equipment, or modified aircraft systems' use against flare deployment. Electronic warfare also includes DE weapons tests, including high-energy laser (HEL) and high-power microwave (HPM) systems from land, vessels and aircraft.

2.1.1.3 Surface Warfare

The mission of surface warfare is to obtain control of sea space from which naval forces may operate, and entails offensive action against other surface, subsurface, and air targets while also defending against enemy forces. In surface warfare, aircraft use guns, air-launched cruise missiles, or other precision-guided munitions; ships employ naval guns, and surface-to-surface missiles; or submarine-launched, anti-ship cruise missiles.

Surface warfare training includes surface-to-surface gunnery and missile exercises, air-to-surface gunnery and missile exercises, and subsurface-to-surface missile activities and other munitions against surface targets.

Testing of weapons used in surface warfare is conducted to develop new technologies and to assess weapon performance and operability with new systems, including unmanned systems. Tests include various air-to-surface guns and missiles, surface-to-surface guns and missiles, and bombing tests. Testing activities may be integrated into training activities to test aircraft or aircraft systems in the delivery of munitions on a surface target. In most cases the tested systems are used in the same manner in which they are used for Fleet training activities.

2.1.1.3.1 Air-to-Surface

Air-to-surface tests evaluate the integration of a missile or other weapons system into Department of Defense aircraft, or the performance of the missile/system itself. Missiles are fired from an aircraft against a variety of mobile seaborne targets and fixed aim points. The missiles are highly instrumented to record the intercept parameters and normally do not carry live warheads. Range support includes range clearance, instrumentation, surface target presentation and recovery, TM, surveillance aircraft, and fixed land targets. These tests may include use of conventional ordnance for captive carry (inert), live motor but no warhead, or tactical full-capability rounds for firing and warhead detonation. The seaborne targets are usually not destroyed and are recovered for subsequent use.

2.1.1.3.2 Surface-to-Surface

Surface-to-surface tests evaluate the overall weapon system performance, warhead effectiveness, and software/hardware modifications or upgrades of ground-based and ship-based weapons systems. Missiles are fired from a ship or a land-based launcher (at Naval Base Ventura County [NBVC] Point Mugu or San Nicolas Island [SNI]) against a variety of mobile seaborne targets and fixed aim points. The missiles are highly instrumented to record the intercept parameters and normally do not carry live warheads. Surface targets include mobile seaborne targets and land-based fixed aim points, such as the Land Impact Site on SNI. Range support includes range clearance, instrumentation, surface target presentation and recovery, TM, surveillance aircraft, and fixed land targets. These tests may include use of conventional ordnance for inert warheads or tactical full-capability rounds for firing and warhead detonation. The seaborne targets are usually recovered for subsequent use.

2.1.1.3.3 Subsurface-to-Surface

Subsurface launches of sub-sonic cruise missiles, which are aerodynamically guided jet-engine powered missiles that fly with constant speed to deliver a warhead at specified fixed aim point targets over a long distance with high accuracy; or ballistic missiles, which are rocket-propelled self-guided missiles that follow a ballistic trajectory with the objective of delivering one or more warheads to a predetermined target. A ballistic missile is only guided during relatively brief periods of flight, and most of its trajectory is unpowered and governed by gravity and air resistance if in the atmosphere. Both missiles are

considered a component of subsurface-to-surface events. The PMSR supports the launch phase of a ballistic missile test, the launch and initial missile travel of a cruise missile test, and, on occasion, the terminal phase of a cruise missile test. These tests evaluate the overall weapon system performance, warhead effectiveness, and software/hardware modifications or upgrades of submarine-launched weapons systems. Range support includes range clearance, instrumentation, TM and surveillance aircraft, and other related range support.

2.1.2 Point Mugu Sea Range Systems

Activities on the PMSR may include the use of a variety of systems (aircraft, support vessels and range craft, ships, submarines, targets, and munitions). The following sections will provide information on each of these systems and their use.

2.1.2.1 Range Aircraft

Range aircraft that support the mission of the PMSR fall into three categories: range surveillance and instrumentation, logistics, and testing and training platforms (including target launch). Range aircraft are either based at Point Mugu, assigned to NAWCWD at other locations, or contracted to support specific tests. Typical aircraft may include F-35, F/A-18, MH-60, E2, and P-3/P-8. For purposes of this EIS/OEIS, aircraft activities are referred to as a sortie. An aircraft sortie consists of a takeoff, the assigned mission, and a subsequent landing by a single aircraft. Aircraft sorties typically last a few hours depending on the type of aircraft and the mission. The PMSR is divided into defined areas to allow multiple events to occur simultaneously and to maintain a safety margin for concurrent test and associated training activities.

2.1.2.2 Range Vessels

Vessel types supporting the PMSR include tugs, target boats, range support boats (e.g., aviation rescue boats, Navy's Self Defense Test Ship) based out of Port Hueneme, and ships (e.g., destroyers, cruisers, aircraft carriers, submarines) that are based elsewhere. A vessel activity is referred to as an event. An event may include a vessel entering the sea range, accomplishing its assigned mission, and then exiting the range. Events can last from a few hours to several days. The smaller support vessels are fuel limited and generally do not have crew accommodations to allow for an extended stay afloat on the PMSR. The larger vessels can remain on the range for extended periods supporting multi-day testing and training activities. Typical Navy vessels may include Guided Missile Cruiser, Guided Missile Destroyer, Amphibious Assault Ship, and Littoral Combat Ship.

2.1.2.3 Targets

Testing and training on the PMSR requires a large array of representative targets, both airborne and surface targets. Typical airborne target systems include small jet powered drones, supersonic missiles, and full-scale unmanned fighter aircraft, which can be flown via remote control from the ground. Most target systems are not destroyed during testing or training and are recovered for reuse. Airborne targets can be launched from aircraft or from surface launch sites at NBVC Point Mugu, SNI, or from a support vessel. Representative types of aerial targets may include BQM-34s, BQM-177s, GQM-163s, and NATS. Representative surface targets may include Mobile Ship Target, Fast Attack Craft Target, High-Speed Maneuvering Surface Target, Low-Cost Modular Target, and QST-35.

2.1.2.4 Munitions

Military munitions are used throughout the PMSR. It is an integral component of most PMSR events, as new systems must receive a validated end-to-end evaluation prior to being introduced to the fleet for combat use. Munition use is organized by type and includes bombs, projectile ammunition from various

naval weapon systems, missiles, and rockets. Munitions may contain high explosives or be inert, depending on the mission objective.

2.1.3 Expanded Technologies and Capabilities Since 2002 Environmental Impact Statement/Overseas Environmental Impact Statement

Since the 2002 EIS/OEIS, expanded mission capabilities have been implemented and covered under separate environmental planning documents as discussed in Section 1.7.4 (Related Environmental Documents). This EIS/OEIS consolidates these actions and provides an updated analysis by resource area if applicable. These mission capabilities fall within the existing warfare areas presented above and associated documents are incorporated by reference as applicable for each resource area in this EIS/OEIS.

2.1.3.1 Electronic Warfare Combat

Under the Proposed Action, NAWCWD would expand Electronic Warfare (EW) capabilities on the PMSR to provide representative near-shore, littoral, and open water environments to test military systems against EW threats, as well as train crews against representative EW threats. The EW range can be structured to simulate early warning radar, shipboard anti-aircraft artillery and missile fire control radar, as well as land-based anti-aircraft artillery and missile fire control radar. The PMSR would provide Range users with threat simulators, operations and range control, instrumentation, time-space-position information, TM, optical and communications, data processing and display systems, signal monitoring, and calibration of systems.

The use of EW range threat emitters would include up to 20 specialized mobile radars (radar signal emulator systems) positioned around the PMSR, including positions at Point Mugu, SNI, Santa Cruz Island, Vandenberg Air Force Base, and possibly Laguna Peak. The radar signal emulator systems are mobile and self-contained and emulate multiple threat signals using frequencies similar to those used for satellite communications, cordless phones, Bluetooth devices, and weather radar systems. Other EW technologies include a wide range of pulsed, continuous wave, Doppler, and multispectral emitters. These systems operate over multiple frequency spectrums including infrared, radio frequency, electro-optical, and millimeter wave.

Testing and scheduled training events on the EW range would include the use of aircraft, surface vessels, and weapon systems. The types of EW events would include electronic countermeasure, radar warning receiver, UAS operation, chaff and flare effectiveness evaluation, towed and air-launch decoy testing, anti-radiation missile flight testing to evaluate seekers and avionics, and tactics development, with all events falling within the existing Electronic Warfare mission area as described in Section 2.1.1.2 (Electronic Warfare).

2.1.3.2 Directed Energy Weapons Test

In 2015, an EA was prepared for DE Test Facilities on SNI to facilitate the testing of HEL and HPM systems. The EA analyzed establishing infrastructure on SNI to support directed energy testing and personnel training on the Sea Range (U.S. Department of the Navy, 2015). The proposed action for the EA consisted of establishing shooter sites, a target site, and supporting infrastructure, as well as the activities associated with the use of these facilities and infrastructure. In addition, another EA was prepared in 2014 for PMSR Countermeasure Testing and Training (U.S. Department of the Navy, 2014). This EA included analyses of DE activities associated with HEL and HPM systems with shooter and target locations within the PMSR, including NBVC Point Mugu as discussed in Section 1.2.3.2 (Naval Base

Ventura County Point Mugu). Lastly, an EA was prepared for the construction of a Directed Energy Systems Integration Laboratory (DESIL) on NBVC Point Mugu to support test functions in a land and sea environment (U.S. Department of the Navy, 2019). DE activities originating from the DESIL and occurring on the PMSR would be the same types of activities previously analyzed under the 2014 Countermeasure Testing and Training EA (U.S. Department of the Navy, 2014). All Directed Energy activities fall within the existing Electronic Warfare mission area as described in Section 2.1.1.2 (Electronic Warfare).

The Proposed Action for this EIS/OEIS includes the DE activities as described above and analyzed in the 2015 SNI DE Test Facilities EA and the 2014 PMSR Countermeasures EA, as well as DE activities conducted from the DESIL on Point Mugu, once built. Under this Proposed Action, there would be no changes to the HEL and HPM system parameters as described in these EAs for these types of activities. The 2015 SNI DE Test Facilities EA or the 2014 PMSR Countermeasures EA are incorporated by reference as applicable for each resource area in this EIS/OEIS. For HEL and HPM testing and the testing and evaluation of other inbound non-warhead (inert) missiles, bombs and rockets may be fired at stationary targets located in the Land Impact Site on SNI. While these weapons are considered inert, some do use small pyrotechnic devices (e.g., spotting charges, live fuses).

2.1.3.3 Laser Systems

In 2010, an EA/Overseas EA (OEA) was prepared for laser testing and training on the PMSR. The EA/OEA analyzed an increase in test, evaluation, and training activities under various weather conditions on the PMSR and included multiple types of lasers including weapons, designators, tracking lasers, communications and range finders (U.S. Department of the Navy, 2010). Testing and scheduled training activities involve directing laser energy at various types of fixed or dynamic targets from fixed or dynamic laser sources. Lasers could be operated from surface craft at sea, aircraft, or on land at SNI or Point Mugu and would be directed at targets at sea, in the air, or on land at SNI or Point Mugu.

Under the Proposed Action for this EIS/OEIS, there would be no change to laser-based systems operations in how they are described in the 2010 Laser EA. Laser-based systems are used as sensors for atmospheric characterization measure atmospheric turbulence and transmission capabilities to predict the effects of the high-power lethal laser on its intended target. Current laser weapons are continuous wave; pulsed lasers may be used as range finders and other purposes. Both continuous-wave and pulsed lasers were analyzed in the 2010 Laser Testing and Training EA/OEA and are incorporated by reference as applicable for each resource area. All laser activities fall within the existing Electronic Warfare mission area as described in Section 2.1.1.2 (Electronic Warfare).

2.1.3.4 Radar and Microwave Systems

High-power radar studies have been infrequently performed on the PMSR, analogous to HPM testing. Under the Proposed Action, increases in radar and microwave testing on the PMSR are anticipated but are not to exceed tempos previously analyzed, as the Navy continues to study the wavelengths, frequencies, and powers of radar and HPM systems in step with their development. HPM weapons will be employed on surface vessels as well as aircraft, as described in the 2014 PMSR Countermeasure Testing and Training EA. These HPM tests fall within the existing Electronic Warfare mission area as described in Section 2.1.1.2 (Electronic Warfare).

Requirements identified the use of existing Point Mugu land-based test pads and the DESIL, and locations on SNI, such as the Building 807 Launch Complex or Tender Point, as HPM firing sites to engage land, surface, and air targets. These land-based tests on a maritime environment would yield decisive experience before costly installation of HPM weapons on a test ship or Navy vessel.

2.1.3.5 Long-Range Weapons Delivery Systems

The Navy has initiated programs to deliver a new generation of precision, very long-range weapons that are designed to give the Navy the ability to quickly strike targets worldwide with almost no notice, along with anti-ship weapons that are able to safely engage and destroy high-value targets from extended range with superior odds against improving air defense systems. These program's extraordinary range and precise lethality are fully supported on the PMSR. Examples of long-range weapons include precision standoff missiles and hypersonic vehicle testing on the PMSR as discussed below. These long-range weapons systems testing fall within the existing Air and Surface Warfare mission areas discussed in Section 2.1.1 (Primary Mission Areas).

2.1.3.5.1 Hypersonic Vehicle Test Program

The objective of the Hypersonic Vehicle Test Program is to develop and demonstrate key technologies to enable an air-launched tactical range hypersonic test vehicle for rapid response capabilities. Data collected during these tests are utilized to predict the performance of future, mature vehicle delivery systems. F-15, B-52, or similar aircraft serve as the primary platform for hypersonic test vehicle launches. Flight tests are typically conducted at altitudes of up to 80,000 feet and can range 450–2,000 miles, traveling at hypersonic speeds (over Mach 5). The flight vehicle is released and air-launched where its solid rocket motor booster will ignite. The spent booster or boosters and protective shroud then separate from the test vehicle which will continue to travel in a westerly direction through the PMSR towards a pre-determined impact site in the broad open ocean.

Each event may involve three phases: a practice run, a dress rehearsal, and then the actual event. PMSR support for the event includes conducting surveillance, data monitoring, and the test itself. Multiple aircraft are used for each test: range clearance, surveillance, and one launch platform. The surveillance planes are used to monitor where the booster splashes and where the hypersonic vehicle lands. A series of sea- and air-based sensors are used to monitor and collect data from the time of ignition to the point of impact.

2.1.3.5.2 Precision Standoff Missiles

Precision standoff weapons are missiles or bombs that may be launched from a distance sufficient to allow attacking personnel to evade defensive fire from the target area. Typically, they are used against land- and sea-based targets in an offensive operation. These weapon systems provide the ability to engage the target while standing off outside the range at which the defenders are likely to engage the attacker. Typical standoff weapons include cruise missiles, glide bombs, and ballistic missiles.

2.2 Proposed Action

The Navy's Proposed Action is to conduct military readiness activities within the PMSR. The Proposed Action includes most testing and training activities analyzed in the 2002 PMSR EIS/OEIS and activities associated with the EAs completed at PMSR since 2002. This EIS/OEIS consolidates these actions into one document, as applicable. Certain activities associated with the 2002 PMSR EIS/OEIS and completed EAs are not included as part of the Proposed Action for this EIS/OEIS, as discussed below. All activities that are included in the Proposed Action fall within the existing warfare areas presented above, and associated documents are incorporated by reference for each resource area in this EIS/OEIS, as appropriate.

The Proposed Action includes current range activities as well as an increase in overall operational tempo and activities, to include increased use of W-532. Testing and training activities would be conducted at

sea and in designated airspace within the PMSR Study Area. Additionally, analyzed as part of the Proposed Action, are the missile launch operations and DE activities originating from NBVC Point Mugu and SNI.

At Point Mugu, the Navy proposes to analyze testing activities associated with the DESIL, and launch activities associated with the Launch Complex Building 55, including the Alpha, Bravo, Charlie, and Nike Zeus launch pads. Typical targets currently launched from Building 55 and associated launch pads include the BQM series. These targets require use of rocket-assisted takeoff bottles or jet assisted takeoff bottles, depending on the type of target. Missiles can also be launched from a truck within the launch complex area. The truck is self-contained and is only onsite for the launch duration.

For SNI, the Navy proposes the continued use of the Land Impact Site, a 10.5-acre target area located on the northwest corner of the island historically associated with the Standoff Land Attack Missile (SLAM) testing program, for routine air-to-surface testing activities. The Land Impact Site is used for air-to-surface and surface-to-surface tests using inert¹ weapon systems. Targets in the area may include empty Container Express (commonly known as CONEX) boxes configured to simulate buildings, helicopter or aircraft bodies, as well as other constructed simulated targets can be used in the area. The Land Impact Site is the only active impact site on SNI and has been in use for decades. The proposed tempo for the continued use of the Land Impact Site will not exceed what was previously analyzed in the 1998 Environmental Assessment (EA) for Non-warhead SLAM and Future Model SLAM Firings, approximately 8–26 times annually (U.S. Department of the Navy, 1998). In addition, the Navy proposes the continued use of the existing Alpha Launch Complex and the Building 807 Launch Complex for routine target and missile launch activities. The Alpha Launch Complex is typically used for launching the GQM-163A supersonic target and the Building 807 Launch Complex is used to launch both targets and missiles. The proposed tempo for the routine use of the launch complexes would not exceed what was previously analyzed in the 2002 PMSR EIS/OEIS, approximately 40 launch events annually (U.S. Department of the Navy, 2002). Lastly, the Navy proposes to conduct testing activities associated with the DE facility on SNI. Construction and use of the DE facility on SNI was previously analyzed in the 2015 Directed Energy Test Facility at SNI (U.S. Department of the Navy, 2015). There is no change in tempo proposed for DE activities on SNI from what was analyzed in the 2015 environmental assessment for the DE facility of approximately 125 days/year.

The Navy does not propose any changes from current activities or testing activity support from NBVC Port Hueneme.

The Proposed Action does not include the following activities previously analyzed in the 2002 EIS/OEIS: (1) small-scale amphibious warfare training, (2) special warfare training on SNI, and (3) inert mine shape drops in the nearshore waters of Becher Bay off Santa Rosa Island. These actions are no longer being conducted because of increasing populations of pinnipeds using beach areas on SNI as rookeries and for pupping, as well as increases in recreational use at Becher Bay (which is within the Channel Islands National Marine Sanctuary). Furthermore, activities covered under existing EAs involving temporary locations, such as temporary land-based target areas for DE activities, are not included in the Proposed Action for this EIS/OEIS. The EAs for these types of activities will continue to provide coverage for temporary land-based activities and locations, unless the actions or locations should change.

¹ For the purposes of this EIS/OEIS, the term “inert” is used to imply a “non-explosive practice munition.” However, these inert munitions may contain small explosives charges such as fuses, squibs, spotting charges, Flight Termination System charges, or other smaller explosives. Batteries and unexpended fuel may also be present.

The Proposed Action for this EIS/OEIS includes ongoing activities that are reasonably certain to occur in the foreseeable future using existing or currently proposed facilities and range infrastructure.

2.3 Environmental Baseline (Current Level of Activities)

An “environmental baseline,” distinct from a no action alternative, was needed to evaluate the potential impacts of all alternatives to existing conditions. Therefore, the baseline activities for the PMSR are the average of representative activities over the most recent eight-year span reported in the Test Resource Management System (TRMS) database and other sources (from 2011 to 2018) for flight operations, vessel operations, aerial targets, surface targets, and munitions. For analytical purposes, the baseline provides a reference point in which to compare the effects of the Action Alternatives. The current environmental baseline includes activities analyzed in the 2002 PMSR EIS/OEIS and subsequent EAs, as discussed in Section 1.7.4 (Related Environmental Documents). These analyses determined that there were no significant impacts as a result of current activities.

Table 2-1 provides a summary of the PMSR baseline operations, including flight operations and vessel operations, as well as usage of aerial targets, surface targets, and munitions as compared to the Action Alternatives.

Table 2-1: Representative Baseline Flight and Vessel Operations and Usage of DE Systems, Targets, and Munitions Compared to the Action Alternatives

Activity/Targets/Munition	Sub Category	Baseline	Alternative 1	Alternative 2
Flight Operations (# of sorties)	Scheduled Range Flights	3,934	5,288	4,822
Sea Range Vessel Operations (# of activities)	N/A	300	333	333
Support Boat Operations (# of activities)	N/A	198	199	199
Sea Range Aerial Targets (# of targets)	N/A	104	176	169
Sea Range Surface Targets (# of targets)	N/A	430	522	843
Ordnance (# of ordnance)	Bombs	22	30	55
	Gun Ammunition	11,670	281,230	40,230
	Missiles	231	584	396
	Rockets	30	40	31
	Chaff	20	16	10
	Flares	28	10	10
Directed Energy (# of days)	Lasers/High Power Microwave	624	624	624

2.4 Alternatives

The identification, consideration, and analysis of alternatives are critical components of the NEPA process and contribute to the goal of making better decisions from an environmental standpoint that also meet the purpose and need. The Council on Environmental Quality requires, and provides guidance on, the development of alternatives. The regulations require the decision maker to consider the environmental effects of the proposed action, as well as a range of alternatives (including the No Action Alternative) (40 Code of Federal Regulations section 1502.14). Council on Environmental Quality guidance further provides that an EIS must rigorously and objectively explore all reasonable alternatives

for implementing the proposed action and, for alternatives eliminated from detailed study, briefly discuss the reasons for eliminating from further consideration. To be reasonable, an alternative, except for the No Action Alternative, must meet the stated purpose of and need for the proposed action.

2.4.1 Screening Criteria

This Proposed Action is a continuation of the activities addressed in the 2002 PMSR EIS/OEIS; therefore, previous criteria used to identify reasonable alternatives still apply with no additional alternative screening criteria identified. Screening criteria used in the 2002 PMSR EIS/OEIS include:

- Reasonable alternatives must fulfill the need for, and purpose of the proposed action.
- Reasonable alternatives must be consistent with the strategic vision for NAWCWD Point Mugu.
- Reasonable alternatives must support current NBVC planned facilities, instrumentation, and infrastructure and must be complementary to existing PMSR capabilities (U.S. Department of the Navy, 2002).

2.4.2 Alternatives Eliminated From Further Consideration

Alternatives eliminated from further consideration in Section 2.5.1 (Alternatives Eliminated from Further Consideration) of the 2002 PMSR EIS/OEIS included the following:

- Alternative tests (for anti-submarine warfare, tests that use high explosives underwater, and tests that require line detonation)
- Alternative training exercises (the use of a landing craft air cushion [LCAC] training with live munitions on SNI, and training involving underwater explosives)
- Alternative facility modernization (development of an instrumented underwater acoustic range and development of a space launch capability)

Alternative tests and training exercises reassessed based on the screening criteria were determined not to be reasonable alternatives for this EIS/OEIS for the same reason they were eliminated in the 2002 PMSR EIS/OEIS because of their inconsistency with both the mission and strategic vision for the PMSR.

The purpose of the Proposed Action is to conduct military readiness activities that meet future requirements within the PMSR; therefore, other locations were not considered because the PMSR is an established instrumented range and in close proximity to established supporting infrastructure. Therefore, conducting activities at alternative sites outside of the PMSR does not constitute a reasonable alternative and is not analyzed further in this EIS/OEIS.

2.4.3 Alternatives Carried Forward

For purposes of this EIS/OEIS, three alternatives are carried forward for analysis: a No Action Alternative, and two action alternatives. While the No Action Alternative does not meet the Navy's purpose of and need for the Proposed Action, it does meet the National Marine Fisheries Service (NMFS) purpose and need as a cooperating agency for this EIS/OEIS. The Navy action alternatives are based on quantitative operational data obtained from the PMSR TRMS scheduling database as well as data collected from NAVAIR and NAVSEA Program Office's regarding projected and foreseeable future activities.

2.4.3.1 No Action Alternative

As mentioned above in Section 2.2 (Proposed Action), the Council on Environmental Quality implementing regulations require inclusion of a No Action Alternative and analysis of all reasonable alternatives to provide a clear basis for choice among options by the decision maker and the public (40 Code of Federal Regulations section 1502.14). Council on Environmental Quality guidance identifies two approaches in developing the No Action Alternative (46 Federal Register 18026). One approach for activities that have been ongoing for long periods of time is for the No Action Alternative to be thought of in terms of continuing the present course of action, or current management direction or intensity, such as the continuation of Navy testing and PMSR scheduled training in the PMSR Study Area at current levels. The second approach depicts a scenario where the No Action reflects cessation of current activities; in this case, it reflects cessation of the current PMSR scheduled testing and training. The Navy applied the second approach in this EIS/OEIS as it further supports NMFS's regulatory process by presenting the scenario where no authorization will be issued.

Under the No Action Alternative analyzed in this EIS/OEIS, the Navy would not conduct the proposed testing and training activities in the PMSR Study Area. Other military activities not associated with this Proposed Action would continue to occur. Consequently, the No Action Alternative of not conducting the proposed testing and training activities in the Study Area is inherently unreasonable in that it does not meet the purpose and need (see Section 1.6, Purpose of and Need for the Proposed Action) for the reasons stated below. However, the analysis associated with the No Action Alternative is carried forward in order to compare the degree of the potential environmental effects of the Proposed Action with the conditions that would occur if the Proposed Action did not occur (see Section 3.0.5, Overall Approach to Analysis).

From NMFS's perspective, pursuant to its obligation to grant or deny permit applications under the MMPA, the No Action Alternative involves NMFS denying Navy's application for an incidental take authorization under Section 101(a)(5)(A) of the MMPA. If NMFS were to deny the Navy's application, the Navy would not be authorized to incidentally take marine mammals and the Navy would not conduct the proposed testing and training activities in the PMSR Study Area.

2.4.3.2 Alternative 1: Projected Maximum Activity Levels Plus New Requirements (Preferred Alternative)

Alternative 1 is based on the highest potential annual level of increased tempo for planned operations as identified during interviews with range test managers, test and scheduled training mission requirements, or existing NEPA documents for flight operations, vessel operations, aerial targets, surface targets, and ordnance. The majority of test and scheduled training activities proposed under Alternative 1 are the same as or similar to those currently conducted. This alternative includes activities subject to previous analysis that are currently ongoing and have historically occurred on the PMSR. Using the anticipated maximum level of potential testing and scheduled training ensures that Alternative 1 meets the purpose of and need for the Proposed Action, ensures adequate capacity to meet surge years to accommodate wartime conditions, and provides the Navy with the capacity to meet long-term testing and scheduled training requirements. Alternative 1 represents a varying level of changes in tempo over existing activities, where some activities have declined, while others increased. Alternative 1 allows for increased tempo in the northern half of the Sea Range (W-532), primarily increases in EW and DE events that are reasonably expected to occur over the long term. Alternative 1 covers operations and activities that were not reasonably foreseeable at the time of the 2002 PMSR EIS/OEIS, such as DE, EW, long-range weapons, and unmanned systems. Table 2-2 provides the

proposed types and levels of activity with respect to target use, ordnance, and laser and DE use under Alternative 1.

Alternative 1 is the preferred alternative because it supports the full-spectrum of potential testing and training necessary to respond to a future national emergency crisis and is based on increasing requirements to meet the current geopolitical environment.

Table 2-2: Representative Annual Operational Tempo for Baseline, No Action, and Action Alternatives¹

Activity Name	No Action	Baseline	Alternative 1	Alternative 2
Air Warfare				
Missile Exercise/Test (Air-to-Air)	0	53 missiles	190 missiles	98 missiles
Long-Range Weapons Delivery Testing	0	0	10 missiles	10 missiles
Hypersonic Vehicle Testing	0	2 vehicles	14 vehicles	14 vehicles
Gunnery Exercise (Surface-to-Air Medium-Caliber)	0	323 projectiles	11,800 projectiles	3,124 projectiles
Gunnery Exercise (Surface-to-Air Large-Caliber)	0	485 projectiles	2,914 projectiles	530 projectiles
Surface Warfare				
Gunnery Exercise/Test ^{2, 3} (Surface-to-Surface, Air-to-Surface; Ship) (Small-, Medium- or Large-Caliber)	0	8,000 small-caliber projectiles	216,200 small-caliber projectiles	23,600 small-caliber projectiles
		1,147 medium-caliber projectiles	40,200 medium-caliber projectiles	11,076 medium-caliber projectiles
		1,715 large-caliber projectiles	10,116 large-caliber projectiles	1,900 large-caliber projectiles
Bombing Exercise/Test (Air-to-Surface)	0	22 bombs	30 bombs	55 bombs
Missile Exercise/Test (Surface-to-Air)	0	54 missiles	152 missiles	60 missiles
Missile Exercise/Test (Air-to-Surface)	0	99 missiles	150 missiles	179 missiles
Missile Exercise/Test (Surface-to-Surface, Subsurface-to-Surface)	0	8 missiles	20 missiles	8 missiles
Missile Exercise/Test (Air-to-Surface, Rocket)	0	30 rockets	40 rockets	31 rockets
Electronic Warfare⁴				
Directed Energy- Laser Targeting Exercise/Test- Aircraft	0	429 days	429 days	429 days
Directed Energy - High Energy Laser Weapons Test	0			
High Powered Microwave Test	0	195 days	195 days	195 days
Electronic Warfare Operations	0	186 days	186 days	186 days

Table 2-2: Representative Annual Operational Tempo for Baseline, No Action, and Action Alternatives¹ (continued)

Activity Name	No Action	Baseline	Alternative 1	Alternative 2
Counter Targeting – Flare (Ship)	0	28 events	10 events	10 events
Counter Targeting – Chaff (Ship)	0	20 events	16 events	10 events

¹The tempo provided in the above table include inert and explosive weapons as well as some captive carry weapons that are not released. Captive carry are tests typically done to gather data about how a particular design, as well as the aircraft carrying it, handles the basic stresses of being carried aloft and taken through various maneuvers.

²The increase in tempo under Alternatives 1 and 2 for gunnery testing is a result of a proposed increase in Combat Systems Ship Qualification Trials as discussed in Section 2.1.1 (Primary Mission Areas).

³Gunnery events involve guns with high rates of firing “clusters” of munitions (e.g., > 80–200 rounds per minute to 500–650 rounds per minute), hence the high number of munitions used during these activities. The numbers above do not reflect the actual number of events, which can vary and typically last 1–3 hrs.

⁴The Electronic Warfare tempo is not based on the average amounts of actual historical use but rather on total events analyzed in various EAs since the 2002 PMSR EIS/OEIS was completed. These are newer activities for the PMSR and there are no data available on current levels of usages. Electronic Warfare testing events are calculated by number of days systems may be used rather than by number of events. For example, some laser use may be of very short duration (e.g., from minutes to an hour per day while some may be in use intermittingly over the course of a day). Because electronic warfare systems may be used concurrently in multiple locations (e.g., from Point Mugu, SNI, vessels or aircraft), the total of days exceeds the number of days in the year.

2.4.3.3 Alternative 2: Historical Peak Activity Levels Plus New Requirements

Alternative 2 includes all activities under Alternative 1, but with an overall decreased annual tempo from that of Alternative 1. Alternative 2 accommodates variability in tempo in any given year due to emerging technologies that need to be tested. Alternative 2 is based on actual peak (highest levels) operational tempo data between 2011 and 2018, as reported in the TRMS database and other sources, and reflects an overall increase in annual tempo from the current baseline activity (Table 2-2). The historical peak operational tempo represents the highest levels required historically and would capture the future needs of the PMSR. The majority of test and training activities that would be conducted under Alternative 2 are the same as or similar to those conducted currently and subject to previous analysis. Alternative 2 also encompasses the increased use of the northern half of the Sea Range (W-532).

Alternative 2 reflects the highest level of historical testing and scheduled training tempo. Alternative 2 meets the purpose of and need for the Proposed Action. Table 2-2 provides the proposed types and levels of activity with respect to target use, ordnance, laser and DE use under Alternative 2. Alternative 2 differs from Alternative 1 in that Alternative 1 reflects the projected maximum tempo as identified through operational interviews, while Alternative 2 reflects the historical peak as reflected in data collected over the last decade.

The proposed types and level of activities with respect to aircraft operations, vessel operations, target use, and ordnance use for all alternatives and baseline are provided in Chapter 3.0 (Affected Environment and Environmental Consequences) and details of activity scenarios are provided in detail in Appendix A (PMSR Scenario Descriptions).

2.4.4 Mitigation Measures Under Alternatives 1 and 2

The Navy's suite of mitigation measures are discussed in detail in Chapter 5 (Standard Operating Procedures and Mitigation). The Navy will apply all mitigations to either Alternative 1 or 2 to ensure that (1) the benefit of mitigation measures to environmental and cultural resources was considered during the applicable environmental analyses, and (2) Navy Senior Leadership approved each mitigation measure that would be implemented under either alternative. Navy Senior Leadership reviewed relevant supporting information to make a fully informed decision, including the benefit of mitigation measures to environmental and cultural resources, and the impacts that implementing mitigation will have on training and testing activities under either action alternative. As discussed in Chapter 5 (Standard Operating Procedures and Mitigation), the mitigation measures represent the maximum level of mitigation that is practicable for the Navy to implement when balanced against impacts to safety, sustainability, and the ability to continue meeting its mission requirements. The final suite of mitigation measures to be implemented will be determined during the consultation processes.

REFERENCES

- U.S. Department of the Navy. (1998). *Environmental Assessment for Nonwarhead Standoff Land Attack Missile (SLAM) and Future Model Slam Firings*. Point Mugu, CA: Naval Air Warfare Center, Weapons Division.
- U.S. Department of the Navy. (2002). *Final Environmental Impact Statement/Overseas Environmental Impact Statement Point Mugu Sea Range*. Point Mugu, CA: Naval Air Systems Command, Naval Air Warfare Center Weapons Division.
- U.S. Department of the Navy. (2010). *Final Environmental Assessment/Overseas Environmental Assessment for Laser Testing & Training Naval Air Warfare Center Weapons Division Sea Range Point Mugu, CA*. Point Mugu, CA: Naval Air Warfare Center Weapons Division.
- U.S. Department of the Navy. (2014). *Environmental Assessment Point Mugu Sea Range Countermeasures Testing and Training*. Point Mugu, CA: Naval Air Warfare Center.
- U.S. Department of the Navy. (2015). *Final Environmental Assessment - Directed Energy Test Facilities at San Nicolas Island*. Point Mugu, CA: Naval Air Warfare Center, Weapons Division.
- U.S. Department of the Navy. (2019). *Final Environmental Assessment for Directed Energy Systems Integration Laboratory at Naval Base Ventura County, Point Mugu, California*. Port Hueneme, CA: Naval Surface Warfare Center, Port Hueneme Division.

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