Public Draft

Environmental Assessment Proposed Range Redesign of Special Warfare Training Areas 4 and 5

Chocolate Mountain Aerial Gunnery Range, Imperial and Riverside Counties, California

May 2015

Prepared by:

United States Department of the Navy
United States Marine Corps

PUBLIC DRAFT

ENVIRONMENTAL ASSESSMENT
PROPOSED RANGE REDESIGN OF SPECIAL WARFARE TRAINING AREAS 4 AND 5
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE,
IMPERIAL AND RIVERSIDE COUNTIES, CALIFORNIA

Action Proponent:	United States Marine Corps
Title of Proposed Action:	**Proposed Range Redesign of Special Warfare Training Areas 4 and 5**
Project Location:	Imperial and Riverside Counties, California
Document Type:	Environmental Assessment

Abstract

This Environmental Assessment (EA) has been prepared by the United States Marine Corps (USMC) in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code §§ 4321-4370h), as implemented by the Council on Environmental Quality regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508); Department of the Navy regulations for implementing NEPA (32 CFR Part 775); and Marine Corps Order P5090.2A, Change 3, dated August 26, 2013, *Environmental Compliance and Protection Manual*, which establishes procedures for implementing NEPA. The USMC proposes reconfiguring existing range training areas, improving range infrastructure, and increasing the annual throughput of personnel and training events within Special Warfare Training Areas 4 and 5 in the Chocolate Mountain Aerial Gunnery Range in California to provide diversity and flexibility for current and future training. Implementation of the Proposed Action would facilitate maintaining Special Operations Forces at an optimal state of readiness to support current and emerging contingency and wartime requirements. This EA describes the potential environmental consequences resulting from two action alternatives (Alternatives 1 and 2) and the No-Action Alternative.

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May 2015

EXECUTIVE SUMMARY

The United States Marine Corps (USMC) has prepared this Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code §§ 4321-4370h), as implemented by the Council on Environmental Quality regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508); Department of the Navy procedures for implementing NEPA (32 CFR Part 775); and Marine Corps Order P5090.2A, Change 3, dated August 26, 2013, *Environmental Compliance and Protection Manual*, which establishes USMC procedures for implementing NEPA.

The project is located in Special Warfare Training Areas (SWATs) 4 and 5, within the western portion of the Chocolate Mountain Aerial Gunnery Range (CMAGR). SWAT 4 is located within Imperial and Riverside counties, California. SWAT 5 is located within Riverside County, California.

The Proposed Action consists of (1) a reconfiguration and certification of static ranges and live-fire and maneuver (LFAM) areas and improving supporting range infrastructure, and (2) an increase in the annual throughput of personnel and training events within SWATs 4 and 5 within the CMAGR. There would be no change to the existing SWATs 4 and 5 boundaries under the Proposed Action.

The purpose of the Proposed Action is to increase training throughput and maximize range use capabilities within SWATs 4 and 5 at the CMAGR. The Proposed Action is needed because as currently configured, SWATs 4 and 5 do not provide sufficient throughput capacity, the ability for multiple units to conduct simultaneous training, or the flexibility to meet evolving operational requirements.

Implementation of the Proposed Action would facilitate maintaining Naval Special Warfare, USMC, and other forces at an optimal state of readiness to support current and emerging contingency and wartime requirements. Two action alternatives meet the purpose of and need for the Proposed Action: Alternative 1 and Alternative 2. Alternative 2 provides the same elements as presented under Alternative 1, with the addition of enhanced training flexibility by authorizing mounted LFAM training throughout SWATs 4 and 5, unlike Alternative 1, which would constrain mounted LFAM training to specified areas. The No Action Alternative is also evaluated in this EA.

In accordance with NEPA, the USMC analyzed the following resource areas potentially affected by implementation of the three alternatives: geology and soils, water resources, biological resources, cultural resources, public health and safety, air quality, and noise. Impacts to other resource areas are anticipated to be negligible or non-existent from implementation of the alternatives, and as such have not been analyzed in detail.

Table ES-1 presents a summary of the potential impacts to each resource area resulting from the implementation of the alternatives. As shown in Table ES-1, no significant impacts to any resource area would occur with implementation of the Proposed Action. Based on the analysis presented in this EA, the USMC has identified Alternative 2 as the Preferred Alternative.

Table ES-1. Summary of Environmental Consequences

Resource Area	Alternative 1	Alternative 2	No-Action Alternative
Geology and Soils	Cut and fill would result in alterations to topographic features. Crushing of soil crusts and compacting of soils. Increase in erosion. Increase in lead and MCs concentrations in soil. *Conclusion*: **Less Than Significant Impact**.	Cut and fill would result in alterations to topographic features. Crushing of soil crusts and compacting of soils. Increase in erosion. Increase in lead and MCs concentrations in soil. Impacts would be spread out over a greater area as compared to Alternative 1. *Conclusion*: **Less Than Significant Impact**.	Soils would continue to be regularly disturbed by training, contributing to wind and water erosion by reducing vegetative cover and breaking up the soil crust. Lead and MCs would continue to be deposited into soils. *Conclusion*: **Less Than Significant Impact.**
Water Resources	Alterations to existing ephemeral drainages; however, no change the hydrologic function of the ephemeral drainages as the flow of stormwater would not be obstructed or restricted. Direct impacts to 6,264 linear ft (1,909 m) of ephemeral drainages, including up to 0.41 acre (0.17 ha) of ephemeral drainages. Increased runoff, erosion, turbidity, and sedimentation. No impact to surface water features. *Conclusion*: **Less Than Significant Impact.**	Alterations to existing ephemeral drainages; however, no change the hydrologic function of the ephemeral drainages as the flow of stormwater would not be obstructed or restricted. Direct impacts to 6,264 linear ft (1,909 m) of ephemeral drainages, including up to 0.41 acre (0.17 ha) of ephemeral drainages. Increased runoff, erosion, turbidity, and sedimentation; spread out over a greater area as compared to Alternative 1. No impact to surface water features. *Conclusion*: **Less Than Significant Impact.**	Training activities within or passing through ephemeral drainages would continue to result in localized impacts to water resources, resulting in erosion and sedimentation. No impact to the quantity or quality of offsite permanent surface water features. *Conclusion*: **Less Than Significant Impact.**
Biological Resources	Approximately 115 acres (47 ha) of plant community types would be permanently impacted by construction. All of the plant communities and habitats in SWATs 4 and 5 and the HHIA (34,770 acres [14,070 ha]) would potentially be disturbed and degraded by mounted and dismounted training, use of explosives, and/or other training related activities. There would be adverse effects to the desert tortoise with the potential for takes. However, implementation of AMMMs and other requirements of the forthcoming BO would minimize potential for impacts to biological resources, including the desert tortoise. *Conclusion:* **Less Than Significant Impact.**	Impacts to biological resources under Alternative 2 would be similar in nature to those under Alternative 1, with the exception that under Alternative 2, mounted training exercises would be permitted over much larger areas of SWATs 4 and 5. Therefore, the implementation of Alternative 2 would expose more biological resources, including desert tortoises, to disturbance at a less intense or concentrated rate. For example, as mounted training exercises would not be restricted to designated LFAM areas, vehicular disturbance would be more dispersed. However, implementation of AMMMs and other requirements of the forthcoming Biological Opinion would minimize potential for impacts to biological resources, including the desert tortoise. *Conclusion:* **Less Than Significant Impact.**	Training would continue to result in localized impacts to biological resources. With respect to the desert tortoise, training would continue to be directed by the BO issued to MCAS Yuma (1-6-95-F-40), dated April 18, 1996. *Conclusion:* **Less Than Significant Impact.**

Resource Area	Alternative 1	Alternative 2	No-Action Alternative
Cultural Resources	The potential effects on historic properties cannot be fully determined prior to completion of the EA. A programmatic agreement will be executed to guide the continuation of the Section 106 consultation and ensure proper consideration and treatment of historic properties. *Conclusion:* **Less Than Significant Impact (Anticipated; subject to programmatic agreement execution).**	The potential effects on historic properties cannot be fully determined prior to completion of the EA. A programmatic agreement will be executed to guide the continuation of the Section 106 consultation and ensure proper consideration and treatment of historic properties. *Conclusion:* **Less Than Significant Impact (Anticipated; subject to programmatic agreement execution).**	Existing cultural resources would remain subject to natural and human disturbances. *Conclusion:* **Less Than Significant Impact.**
Public Health and Safety	Increased potential for UXO and MC concentrations within the project area; however, no increase in public health and safety risk. All SDZs would be within the CMAGR. Fences, gates, signs, and regular range maintenance/removal of mobile targets would reduce potential for trespassing in training areas, resulting in a reduced risk to public health and safety. *Conclusion*: **Less Than Significant Impact.**	Increased potential for UXO and MC concentrations within the project area; however, no increase in public health and safety risk. All SDZs would be within the CMAGR. Fences, gates, signs, and regular range maintenance/removal of mobile targets would reduce potential for trespassing in training areas, resulting in a reduced risk to public health and safety. *Conclusion:* **Less Than Significant Impact.**	Trespassing would continue to present a health and safety risk to the public. All SDZs would continue to be within the CMAGR *Conclusion:* **Less Than Significant Impact.**
Air Quality	Decrease in fugitive dust emissions compared to existing conditions due to application of dust palliative, which would help control the extent and severity of fugitive dust emissions from training. Combined construction and operational emissions would be less than *de minimis* levels for all criteria pollutants. *Conclusion:* **Less Than Significant Impact.**	Fugitive dust emissions would be minimized with the application of dust palliative. Training emissions would be slightly higher with implementation of Alternative 2 when compared to Alternative 1. However, the combined construction and training emissions would still be less than *de minimis* levels for all criteria pollutants. *Conclusion:* **Less Than Significant Impact.**	No increase in emissions. On-going air and ground training activities would continue at existing levels. *Conclusion:* **Less Than Significant Impact.**
Noise	Increase in aircraft and ordnance noise levels; however, increase would not exceed recognized significance thresholds and noise would be consistent with the existing noise environment (i.e., no new noise sources). *Conclusion:* **Less Than Significant Impact.**	Increase in aircraft and ordnance noise levels; however, increase would not exceed recognized significance thresholds and noise would be consistent with the existing noise environment (i.e., no new noise sources). *Conclusion:* **Less Than Significant Impact.**	No change from existing conditions; noise levels would remain below recognized significance thresholds. *Conclusion:* **Less Than Significant Impact.**

Notes: AMMM = Avoidance, Minimization, and Mitigation Measure; BO = Biological Opinion; ft = feet/foot; ha = hectares; m = meter(s); HHIA = high hazard impact area; MCs = munitions constituents; MCAS = Marine Corps Air Station; SDZ = surface danger zone; UXO = unexploded ordnance.

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Acronyms and Abbreviations

ACHP	Advisory Council on Historic Preservation
AICUZ	Air Installation Compatible Use Zone
AMMM	Avoidance, Minimization, and Mitigation Measure
APE	area of potential effect
BA	Biological Assessment
BLM	Bureau of Land Management
BMP	Best Management Practices
BO	Biological Opinion
CA	California
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
CARB	California Air Resources Board
CDFW	California Department of Fish and Wildlife
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFA	Controlled Firing Area
CFR	Code of Federal Regulations
CH_4	methane
CMAGR	Chocolate Mountain Aerial Gunnery Range
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CO_{2e}	carbon dioxide equivalent
CRPR	California Rare Plant Rank
CWA	Clean Water Act
CY	calendar year
dB	decibel(s)
dBA	A-weighted decibel(s)
dBC	C-weighted decibel(s)
DoD	Department of Defense
DoN	Department of the Navy
DRECP	Desert Renewable Energy Conservation Plan
DWMA	Desert Wildlife Management Area
DWTF	Desert Warfare Training Facility
DZ	drop zone
EA	Environmental Assessment
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EO	Executive Order
EOD	Explosives Ordnance Disposal
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FCR	Field Contact Representative
FONSI	Finding of No Significant Impact
ft	feet/foot
ft^2	square feet/foot
FTX	Field Training Exercise
FY	fiscal year
GAP	Gap Analysis Program
GHG	greenhouse gases
GMV	ground mobility vehicle
GWP	global warming potential
H_2S	Hydrogen Sulfide
ha	hectare(s)
HE	high explosive
HHIA	high hazard impact area
HMMWV	High Mobility Multi-Purpose Wheeled Vehicle
Hz	hertz
IAD	Immediate Action Drills
ICAPCD	Imperial County Air Pollution Control District
INRMP	Integrated Natural Resource Management Plan
km	kilometer(s)
km^2	square kilometer(s)
LFAM	live-fire and maneuver
LTO	Landings and Take Offs
LZ	landing zone
m	meter(s)
m^2	square meter(s)
MARSOC	Marine Corps Forces Special Operations Command
MBTA	Migratory Bird Treaty Act
MCIWEST	Marine Corps Installation West
MC	munitions constituents
MCAS	Marine Corps Air Station
MCO	Marine Corps Order
MEU	Marine Expeditionary Unit
mm	millimeter
MOA	Memorandum of Agreement
MRAP	Mine-Resistant Ambush Protected
N_2O	oxides of nitrogen
NAAQS	National Ambient Air Quality Standards
NAVFAC SW	Naval Facilities Engineering Command Southwest
NEPA	National Environmental Policy Act
NEW	net explosive weight
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NO_x	nitrogen oxides

NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NSW	Naval Special Warfare
NSWC	Naval Special Warfare Command
NSWCEN	Naval Special Warfare Center
NSWG	Naval Special Warfare Group
NSWG-1	Naval Special Warfare Group ONE
O_3	Ozone
ORC	Operational Range Clearance
PA	Programmatic Agreement
PITS	Portable Infantry Target System
PM_{10}	particulate matter less than or equal to 10 microns
$PM_{2.5}$	particulate matter less than or equal to 2.5 microns
PSD	Prevention of Significant Deterioration
RCRA	Resource Conservation and Recovery Act
REVA	Range Environmental Vulnerability Assessment
ROD	Record of Decision
ROI	Region of Influence
RTA	range and training areas
RWQCB	Regional Water Quality Control Board
SCAQMD	South Coast Air Quality Management District
SDZ	surface danger zone
SEAL	Sea, Air, and Land
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SOC	Special Operations Capable
SOF	Special Operations Forces
SQT	SEAL Qualification Training
SSAB	Salton Sea Air Basin
StaO	Station Order
SUA	Special Use Airspace
SWAT	Special Warfare Training Area (spelled and called "SWAT" for pronunciation ease)
SWPPP	Stormwater Pollution Prevention Plan
TGM	tactical ground mobility
TRED	Tortoise Regional Estimation of Density
UAS	Unmanned Aerial System
ULT	Unit Level Training
U.S.	United States
USACE	U.S. Army Corps of Engineers
USBR	U.S. Bureau of Reclamation
USC	U.S. Code
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGCRP	U.S. Global Change Research Program
USGS	U.S. Geological Survey
USMC	U.S. Marine Corps
UXO	unexploded ordnance
VOC	Volatile Organic Compounds
WRCC	Western Regional Climate Center
YTRC EIS	Yuma Training Range Complex Environmental Impact Statement

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IMPERIAL AND RIVERSIDE COUNTIES, CA

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CHAPTER 1
PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 INTRODUCTION

The United States Marine Corps' (USMC) Chocolate Mountain Aerial Gunnery Range (CMAGR) is primarily used for live-fire aviation and ground warfare training conducted by USMC and United States (U.S.) Navy forces (Figure 1-1). The CMAGR is located in southeastern California (CA), just east of the Salton Sea and north of the U.S./Mexico border. Command for operations and administration of the CMAGR has been delegated by the Secretary of the Navy to the Commanding Officer, Marine Corps Air Station (MCAS) Yuma. The CMAGR is essential for developing and maintaining the readiness of Marine Corps and Navy aviators. The CMAGR is also vital for ground warfare training[1] conducted by select Navy and Marine Corps forces, notably Naval Special Warfare (NSW) Sea, Air, and Land (SEAL) units.

Within the western portion of the CMAGR are two ground warfare training areas referred to as Special Warfare Training Areas (SWATs) 4 and 5, each of which include a series of training ranges. Operated and controlled by the Commanding Officer, MCAS Yuma, the ranges are primarily used by the Naval Special Warfare Command (NSWC) for land warfare training. The Camp Billy Machen Desert Warfare Training Facility (DWTF) is located within SWAT 4, and serves as the base of operations for NSW training activity within SWATs 4 and 5.

Basic individual skills, intermediate unit level, and advanced integration and sustainment training (e.g., live-fire) are currently conducted within SWAT 4. SWAT 5 presents available range capacity for emergent USMC and NSW training requirements proposed in this Environmental Assessment (EA). Training occurs primarily in conjunction with Naval Special Warfare Center (NSWCEN) SEAL Qualification Training (SQT) and Naval Special Warfare Group (NSWG) ONE (NSWG-1) SEAL Unit Level Training (ULT). NSWG-1 also frequently hosts foreign forces that need to train in the unique CMAGR environment. The Marine Corps currently conducts limited training within SWAT 4.

The USMC has prepared this EA in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [USC] §§ 4321-4370h), as implemented by the Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508); Department of the Navy (DoN) procedures for implementing NEPA (32 CFR Part 775); and Marine Corps Order (MCO) P5090.2A, Change 3, dated August 26, 2013, *Environmental Compliance and Protection Manual*, which establishes USMC procedures for implementing NEPA.

[1] The Navy uses the phrase "land warfare training" to describe Navy training activities that occur on the land (not at sea) whereas the USMC uses the phrase "ground warfare training" to describe USMC training activities that occur on the ground (not in the air). To facilitate reading comprehension, the phrase "ground warfare training" is used in this EA when not branch specific; however, when describing branch-specific training, branch-specific phrasing is used.

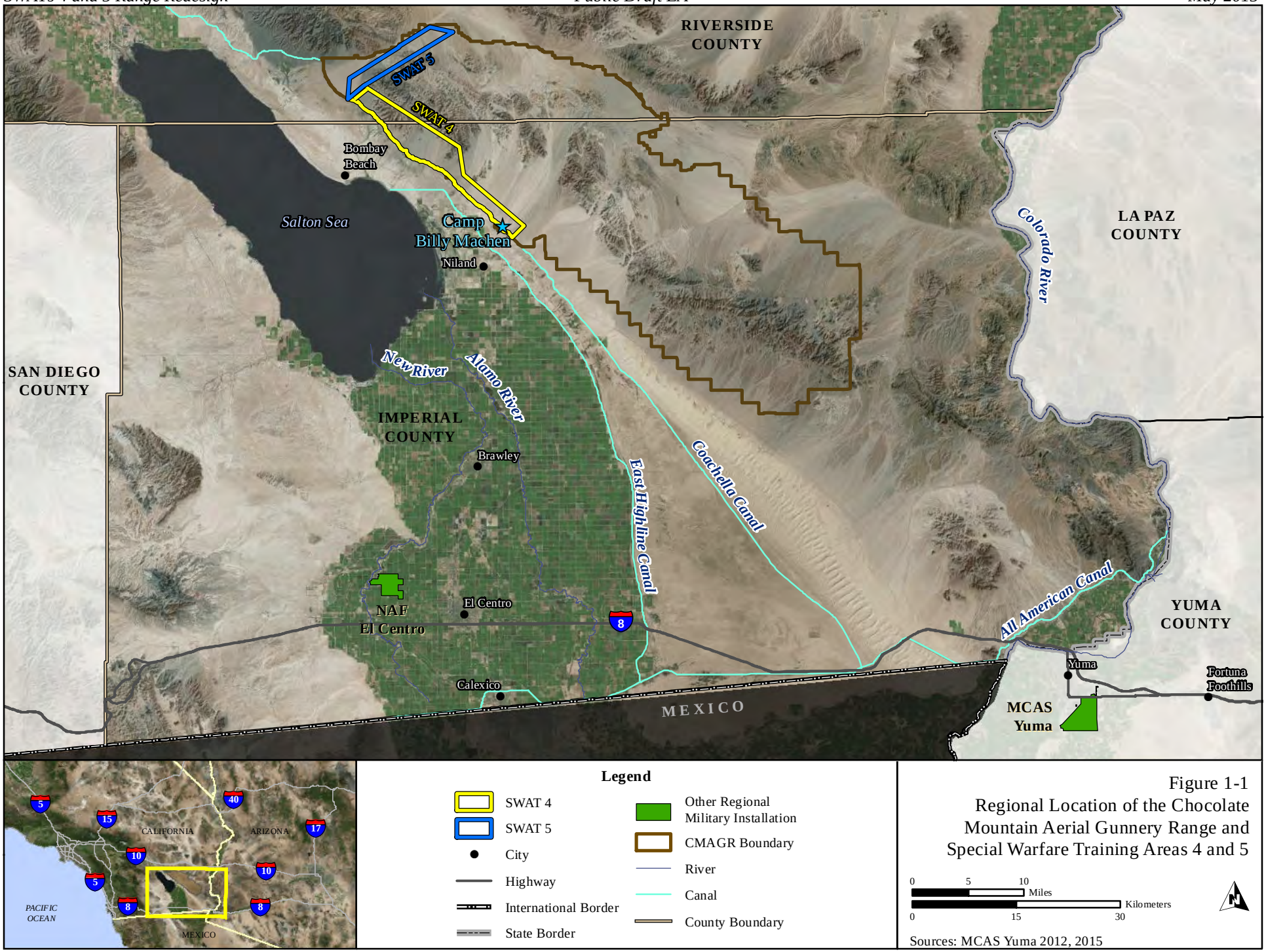


Figure 1-1
Regional Location of the Chocolate Mountain Aerial Gunnery Range and Special Warfare Training Areas 4 and 5

Sources: MCAS Yuma 2012, 2015

1.2 PROJECT LOCATION

The CMAGR, lying on a southeast-northwest axis, is located in north-central Imperial County and south-central Riverside County, CA. The CMAGR is generally bound on the west by the Salton Sea Basin and on the east by the Chuckwalla and Palo Verde mountains. The northern border is separated from the Orocopia Mountains by Salt Creek and includes part of the Chuckwalla Bench. The CMAGR extends south to Highway 78 near Glamis. The project is located in SWATs 4 and 5, within the western portion of the CMAGR. SWAT 4 is located within Imperial and Riverside counties and SWAT 5 is located within Riverside County (Figure 1-2).

1.3 BACKGROUND

1.3.1 Overview

U.S. Special Operations Forces (SOF) are those forces designated by the Secretary of Defense and specifically organized, trained, and equipped to conduct and support operations requiring unique modes of employment, tactical techniques, equipment and training often conducted in hostile, denied, or politically sensitive environments and characterized by one or more of the following: time sensitive, clandestine, low visibility, conducted with and/or through indigenous forces, requiring regional expertise, and/or a high degree of risk (U.S. Joint Chiefs of Staff 2011).

SOF are increasingly being called to serve in protecting the U.S. and its interests abroad from the threats posed by global terrorism; outbreaks of ethnic and secular-based violence; refugee and other humanitarian crises; and criminal and black market activity, including the trafficking in people, illicit drugs, and light military weapons. SOF personnel are well prepared to respond to complex geopolitical crises because their rigorous and realistic training has mentally and physically prepared them to operate as small, highly mobile, flexible, and independent forces. As a result, SOF personnel are able to improvise and adapt their tactics to changing situations or adversaries.

In 2003, the Chief of Naval Operations approved an aggressive recruiting program with the goal of expanding NSW forces. More recently, the 2006 Quadrennial Defense Review (Department of Defense [DoD] 2006) directed growth in both the size and capabilities of SOF over a span of 5 years (2006-2011). To meet its growth and mission requirements, NSW personnel need to increase the throughput capacity of the DWTF.

NSW is currently comprised of approximately 8,900 total personnel, including more than 2,400 active-duty Special Warfare Operators (also known as SEALs), 700 Special Warfare Boat Operators (also known as Special Warfare Combatant-craft Crewmen), 700 reserve personnel, 4,100 support personnel, and more than 1,100 civilians. Located in San Diego, CA, the mission of NSWC is to man, train, equip, deploy, and sustain NSW forces for operations and activities abroad, in support of Combatant Commanders and U.S. national interests. The proven ability of NSW forces to operate across the spectrum of conflict is attributable to the tough and realistic training venue provided at the CMAGR.

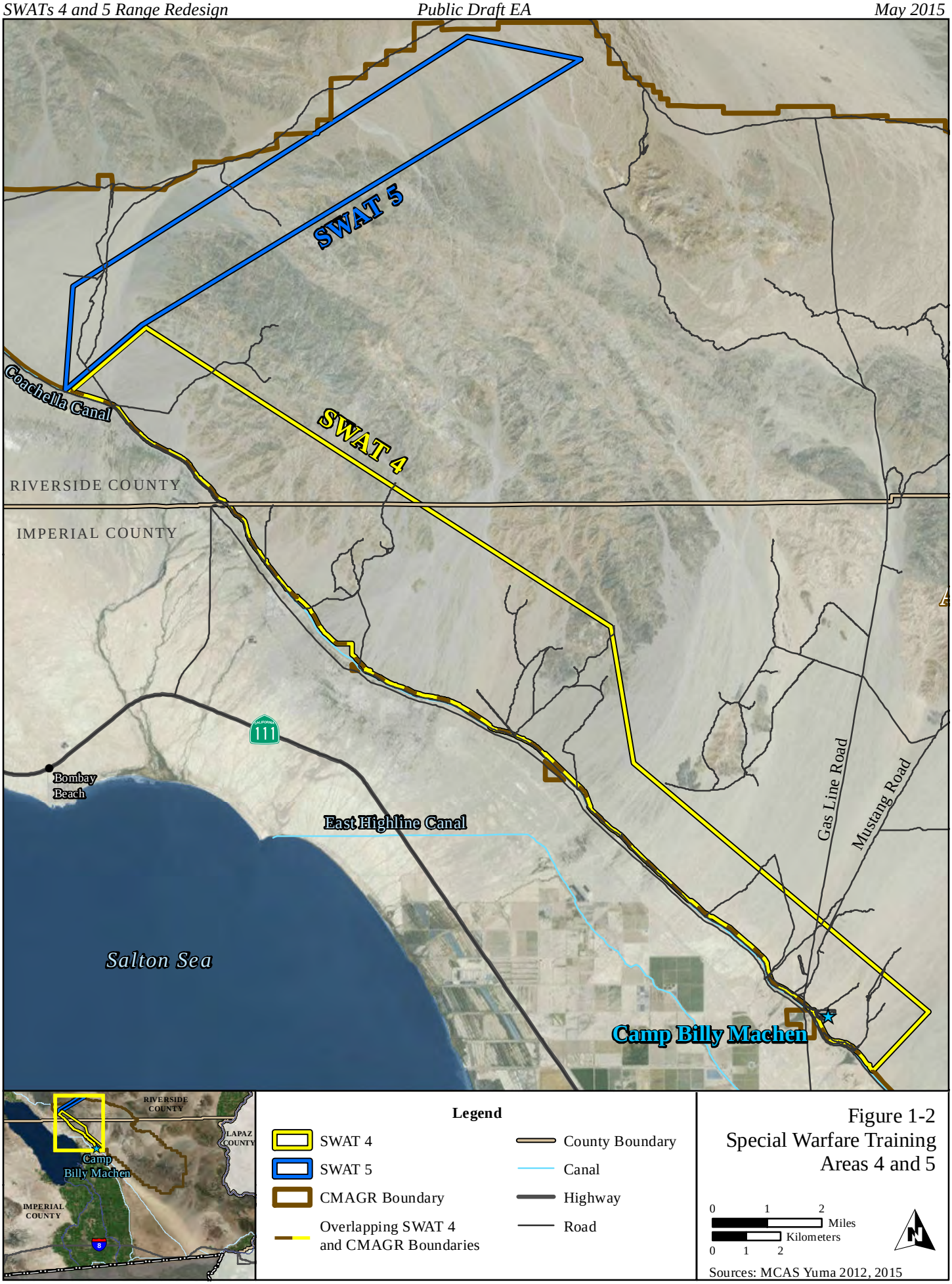


Figure 1-2
Special Warfare Training Areas 4 and 5

1.3.2 Chocolate Mountain Aerial Gunnery Range

The CMAGR is a live-fire training range that is essential for developing and maintaining the readiness of Marine Corps and Navy aviators. The range is also vital for training select Marine Corps and Navy land combat forces. The CMAGR was initially established during World War II and has been indispensable for military aviation training ever since. The range currently supports training by units of the DoN, U.S. Air Force, U.S. Army, U.S. Reserve Components, and U.S. National Guard; however, the Marine Corps is the primary user of the CMAGR. Local command for military operation and administration of the CMAGR has been delegated by the Secretary of the Navy to the Commanding Officer, MCAS Yuma, Arizona (DoN 2013).

Ground combat training at the CMAGR also began during World War II with the opening of a USMC artillery school. The use of the range for ground warfare training dates from 1966, and is oriented toward individual fighting skills and unit tactics. Ground warfare training at the CMAGR typically involves battalion-sized or smaller units. The USMC routinely deploys small units, up to battalion in size, to MCAS Yuma for ground training. Twice annually, the USMC also sends an infantry battalion to MCAS Yuma to support the Weapons and Tactics Instructor Course.

1.3.3 Evolution of NSW Training at the CMAGR

NSW use of the CMAGR has evolved and expanded as the DoD use of SOF has evolved and expanded. In 1966, NSW forces began conducting small unit land warfare training in the CMAGR. In 1971, a 4,000-square foot (ft^2) (371-square meter [m^2]) facility was established to support NSW. This facility came to be known as Camp Billy Machen NSWG-1 DWTF (see Section 1.3.4.2). In subsequent years, training has focused on mounted (personnel moving on or in tactical vehicles) and dismounted (personnel moving on foot) land navigation, reconnaissance and surveillance, small arms training, live-fire and maneuver (LFAM), ambushes, tactical helicopter insertion and extraction, combat search and rescue, demolitions and explosive projectiles, and desert survival. Specific NSW training locations within the CMAGR included Training Areas 1 and 2, Firing Zones 1 and 2, and an unnamed strip of land along the northwestern boundary of the CMAGR (now known as SWAT 5).

In January 1993, MCAS Yuma and NSWG-1 signed a Memorandum of Agreement (MOA) (MCAS Yuma and NSWG-1 1993) that created SWATs 4 and 5. This agreement relocated all NSW training activities from Training Area 1 and Firing Zones 1 and 2 to SWATs 4 and 5 (see Section 1.3.4). The 1993 MOA also addressed scheduling, communications, logistics support responsibilities, and use thresholds for NSW training activities within SWATs 4 and 5. In 1998, Training Area 1 and Firing Zones 1 and 2 were “officially inactivated” when the DoN signed a Record of Decision (ROD) for the USMCs *Yuma Training Range Complex Environmental Impact Statement* (YTRC EIS) (USMC 1997). Neither the YTRC EIS nor the ROD addressed NSW training activities in SWAT 5. To support achievement of NSW training requirements, at the conclusion of the YTRC EIS ROD process, a need was identified to replace an NSW live-fire range within the CMAGR that was inactivated as part of the YTRC EIS.

In August 2007, NSWC and MCAS Yuma established two vehicle maneuver lanes within SWAT 5 for tactical ground mobility (TGM) live-fire training (MCAS Yuma 2007). The training was limited to four exercises in calendar year (CY) 2007 and seven training exercises in CY 2008. After CY 2008, NSWG-1 TGM training shifted to Naval Air Station Fallon ranges. MCAS Yuma has since redesignated the two SWAT 5 TGM live-fire training areas as inactive. Dismounted (foot) movements are authorized in all of SWATs 4 and 5.

Currently, NSW land warfare training within SWAT 4 consists of small unit tactics, communications, land navigation, marksmanship, and demolition activities. Exercises focus on basic skills and small unit tactics including live-fire, marksmanship, land navigation on foot, reconnaissance, surveillance, sniper, direct action, insertion and extraction in hostile territory; demolitions; and small unit supporting arms training. The current NSW annual training throughput within SWAT 4 is 1,371 personnel. The USMC conducts sporadic training consistent with activities described in the 1997 YTRC EIS. Section 2.5 provides a quantitative summary of current training in SWAT 4.

1.3.4 SWATs 4 and 5

1.3.4.1 Overview

SWATs 4 and 5 are characterized by climate and geography similar to arid nations to which personnel may deploy, thereby allowing personnel to operate in, and become acclimated to, the harsh desert environment. Training in such challenging and realistic settings exposes personnel to the discomforts of dust and extreme temperatures while pressing them to concentrate on developing their combat survival skills for mission success.

1.3.4.2 Training Areas

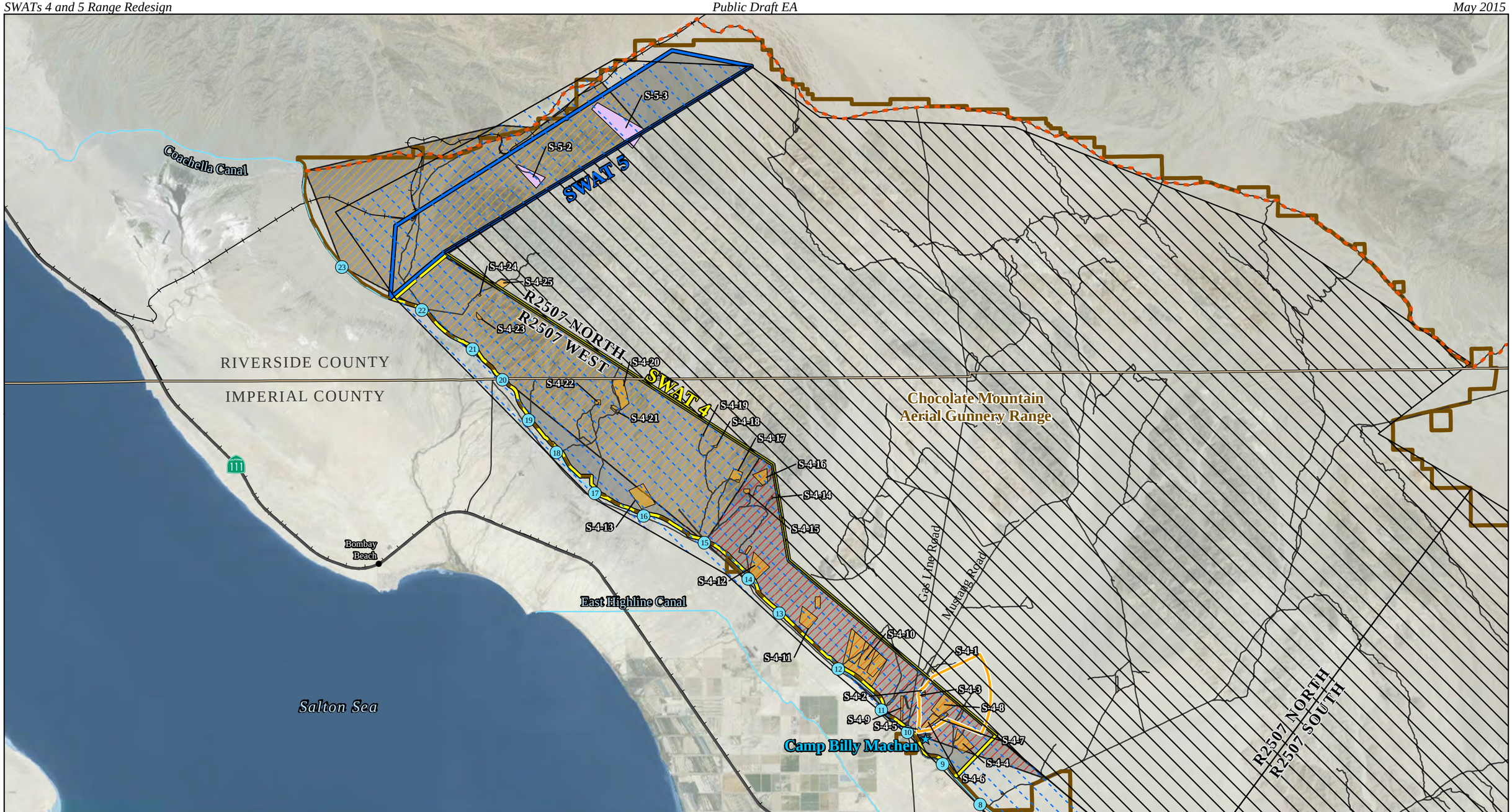
<u>SWAT 4</u>

SWAT 4 covers 23,457 acres (9,493 hectares [ha]), is approximately 20 miles (32 kilometers [km]) long, and varies from 1.2 to 3 miles (1.9 to 4.8 km) wide (Figure 1-3). The narrowest portion is along the southern border, adjacent to Camp Billy Machen, and reaches its maximum width in areas to the north and west of Camp Billy Machen. The Camp Billy Machen NSWG-1 DWTF is a 12 acre (4.9 ha) compound that provides spaces for administrative, communications, instructional, billeting, maintenance, supply, and other functions that support NSWG-1 and NSWC land warfare training (Figure 1-3). Vehicles are restricted to existing roads; off-road driving is prohibited, except for activities associated with ordnance removal (U.S. Fish and Wildlife Service [USFWS] 1996).

Figure 1-3 depicts the existing designated range and training areas (RTAs) in and adjacent to SWAT 4 (some of which are subdivided into A and B ranges). These include sniper ranges, rifle and pistol ranges, a grenade pit, a high-explosive (HE) anti-mechanized/grenade range, static target ranges (one for HE), a land demolition range, a Claymore mine range, a 60-millimeter (mm) mortar range, individual and troop tactical LFAM ranges, and LFAM Field Training Exercise (FTX) ranges. In addition, there is an existing high hazard impact area (HHIA) (associated with the dud-producing ordnance) located north and east of Camp Billy Machen.

<u>SWAT 5</u>

SWAT 5 encompasses 8,447 acres (3,418 ha) and is located along the northwestern CMAGR boundary. SWAT 5 is approximately 10-miles (16-km) long and approximately 1.5-miles (2.4-km) wide (Figure 1-3). Historically, NSW conducted limited training in the two designated SWAT 5 LFAM vehicle maneuver ranges. SWAT 5 presents available range capacity for emergent USMC and NSW training requirements proposed in this EA.



Legend

- SWAT 4
- SWAT 5
- Bombay Controlled Firing Area
- Niland Controlled Firing Area
- R-2507 North/South
- R-2507 West (Planned)
- Existing High Hazard Impact Area
- CMAGR Boundary
- Overlapping SWAT 4 and CMAGR Boundaries
- Existing Range
- Inactive Range (SWAT 5)
- S-4-1 Range Designation
- Bradshaw Trail
- # Coachella Canal Siphon
- County Boundary
- Canal
- Highway
- Road
- Railroad

Note: All of the CMAGR is available as a landing zone for legacy rotary-wing aircraft, where safe to do so.

Figure 1-3
Existing Range and Training Areas and Airspace within and adjacent to SWATs 4 and 5

0 1 2 Miles
0 1 2 Kilometers

Source: MCAS Yuma 2012, 2015

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Special Use Airspace and Aircraft Operations

The Federal Aviation Administration (FAA) designates Special Use Airspace (SUA) to identify areas where military activity (e.g., military aviation training) or unusual flight conditions may occur. A Controlled Firing Area (CFA) is a block of non-regulatory SUA designated by the FAA in which firing activities (e.g., mortar, demolition charges, or artillery shoots) are conducted under controlled conditions to eliminate hazards to nonparticipating aircraft, and to ensure the safety of persons and property on the ground. There is no requirement for nonparticipating aircraft to avoid the airspace, and no communications or air traffic control separation requirements are imposed. Rather, the firing activity must be suspended until traffic is safely clear of the CFA. The responsibility lies completely with the CFA user to terminate activities so that there is no hazard to aviation (FAA 2012).

Two CFAs, the Niland and Bombay CFAs, are located above the project area (see Figure 1-3). The CFAs are used in support of on-going ground-based ordnance firing (e.g., mortars, rockets, and small arms). Unmanned Aerial Systems (UASs) that weigh less than 20 pounds, fly below 1,200 feet (ft) (366 meters [m] above ground level, and are under continuous surveillance by observers can be used in the Niland and Bombay CFAs (USMC 2008a). The USMC recently prepared an EA and associated Finding of No Significant Impact (FONSI) for the establishment of R-2507W Restricted Airspace generally corresponding to the existing Niland and Bombay CFAs (Naval Facilities Engineering Command Southwest [NAVFAC SW] 2014a). Upon approval from the FAA, R-2507W would be established and the CFAs would cease to exist.

Currently, legacy rotary-wing aircraft (e.g., CH-46, MH-47, HH-60, CH-53, AH-1, and UH-1) land within the CMAGR based on mission and aircraft landing safety parameters. Legacy rotary-wing aircraft are used regularly in SWAT 4, to include landing to support mission training. Conversely, SWAT 5 has not been used for landing legacy rotary-wing aircraft primarily because there are no active target sites in SWAT 5, and SWAT 5 has many areas with much topographic relief (steep terrain).

The MV-22 is currently replacing aging CH-46 aircraft. The MV-22 is a new USMC tilt-rotor aircraft that can operate as a helicopter or turboprop airplane. MV-22s are currently flown in the project area and use one of three existing established MV-22 landing zones (LZs): two at Camp Billy Machen and one straddling the eastern boundary of SWAT 4 (see Figure 1-3). According to Boeing, MV-22 aircraft must land on surfaces that do not exceed a 16 percent slope (equivalent to 9 degrees slope) (USMC 2013).

1.3.5 Current Training Deficiencies

The existing ranges as described in the preceding paragraphs have not substantially changed in many decades. In that time, the demands for training have increased, however, strategic and/or historic use of the ranges for training purposes has not kept pace. Thus, the existing range configurations do not provide sufficient throughput capacity, flexibility, or diversity in training to support mounted and dismounted training for LFAM skills, both initial and sustainment training, and improved combat situational training. The No-Action Alternative (see Section 2.5) represents the continuation of these training deficiencies. Specific current training deficiencies include:

- **Inadequate Throughput Capacity -** The existing ranges were designed decades ago when there were fewer SOF personnel. For example, platoons now consist of three squads (24 to 36 personnel) whereas before they consisted of two squads (16 to 32 personnel). As the number of SOF personnel has increased in recent years, neither the number nor capacity of existing ranges has kept pace. Therefore, the ranges have not been able to accommodate increased training

requirements, resulting in difficulties providing the necessary training within available training periods. In addition, Marine Air-Ground Task Force-level and Marine Corps Forces Special Operations Command (MARSOC) training and pre-deployment certification programs require limited duration use of ground ranges distributed throughout the regional range complex for distributed operations and mission readiness training.

- **Inability to Conduct Multiple Simultaneous Training Activities -** The existing configuration of the ranges does not support concurrent training by multiple units training for different missions. Each unit must be able to shoot, move, and communicate in relative isolation from other units. Simultaneously, the static ranges must remain available for the completion of individual training requirements by multiple units. This is often not the case, as units are forced to wait at their range until training at an adjacent or nearby range is completed.
- **Lack of Training Diversity -** The existing RTAs have limited topographic relief and naturally occuring sparse vegetation, which minimize opportunities for concealment during exercises. Range users, particularly veteran SEALs operators, have become very familiar with the target areas and LFAM ranges, reducing training value. The existing RTAs need to be improved and reconfigured to ensure training diversity and realism, and preclude training in predictable situations that limit training challenges. These training area utilization characteristics are also required to support any USMC training conducted in SWATs 4 and 5.

1.4 PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose of the Proposed Action is to increase training throughput and maximize range use capabilities within SWATs 4 and 5 at the CMAGR. The Proposed Action is needed because as currently configured, SWATs 4 and 5 do not provide sufficient throughput capacity, the ability for multiple units to conduct simultaneous training, or the flexibility to meet evolving operational requirements.

1.5 SCOPE OF ANALYSIS

The following initial resource-specific studies were completed in support of this EA:

- *Final Focused Survey and Habitat Assessment for Agassiz's Desert Tortoise on Special Warfare Training Area Ranges 4 and 5, Chocolate Mountain Aerial Gunnery Range, Riverside and Imperial Counties, California,* February 2013 (NAVFAC SW 2013a).
- *Final Cultural Resources Survey Report on Special Warfare Training Area Ranges 4 and 5, Chocolate Mountain Aerial Gunnery Range, Imperial and Riverside Counties, California,* October 2013 (NAVFAC SW 2013b).
- *Addendum 1 to the Final Cultural Resources Survey Report on Special Warfare Training Area Ranges 4 and 5, Chocolate Mountain Aerial Gunnery Range, Imperial and Riverside Counties, California,* August 2014 (NAVFAC SW 2014b).

This EA describes the potential environmental consequences resulting from two action alternatives (Alternatives 1 and 2) and the No-Action Alternative on the following resource areas: geology and soils, water resources, biological resources, cultural resources, public health and safety, air quality, and noise.

1.6 REGULATORY SETTING

This EA has been prepared based on NEPA requirements as outlined in the following statutes, regulations, and guidance documents:

- NEPA of 1969 (42 USC §§ 4321-4370h), which requires an environmental analysis for major federal actions that have the potential to significantly impact the quality of the human environment;
- CEQ regulations (40 CFR Parts 1500-1508), which implement the requirements of NEPA;
- DoN regulations for implementing NEPA (32 CFR Part 775), which provide DoN policy for implementing the CEQ regulations and NEPA; and
- MCO P5090.2A, Change 3, dated August 26, 2013, *Environmental Compliance and Protection Manual*, which establishes USMC procedures for implementing NEPA.

This EA has been prepared in accordance with the following additional statutory and executive requirements:

- Clean Air Act (CAA), as amended (42 USC §§ 7401-7671q), including 1990 General Conformity Rule;
- Clean Water Act (CWA) (33 USC §§ 1251-1387);
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 USC §§ 9601-9675);
- Endangered Species Act (ESA) (16 USC §§ 1531-1544);
- Executive Order (EO) 11593 – *Protection and Enhancement of the Cultural Environment*;
- EO 11988 – *Floodplain Management;*
- EO 11990 – *Protection of Wetlands*;
- EO 12898 – *Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations*;
- EO 13045 – *Protection of Children from Environmental Health Risks and Safety Risks*;
- EO 13148 – *Greening the Government through Leadership in Environmental Management;*
- EO 13186 – *Responsibilities of Federal Agencies to Protect Migratory Birds*;
- Migratory Bird Treaty Act (MBTA) (16 USC §§ 703-712);
- National Historic Preservation Act (NHPA) (54 USC §§ 300101-305306);
- American Indian Religious Freedom Act (42 USC §§ 1996 and 1996a); and
- Resource Conservation and Recovery Act (RCRA) (42 USC §§ 6901-6992k) and governing regulations (40 CFR Parts 260-282).

Table 1-1 presents the anticipated regulatory permits and approvals for the Proposed Action. Appendix A contains public and agency correspondence.

Table 1-1. Anticipated Regulatory Permits and Approvals for the Proposed Action

Regulatory Agency	Permit/Review/Approval	Current Status[1]
USFWS	BO pursuant to Section 7 of the ESA	MCAS Yuma is coordinating with the USFWS
SHPO	Finding of effect pursuant to Section 106 of the NHPA	MCAS Yuma is coordinating with the SHPO and Indian Tribes
USACE	CWA Section 404 Permit for filling or dredging in waters of the U.S.	MCAS Yuma is coordinating with the USACE
USBR	Written authorization to cross USBR lands	MCAS Yuma is coordinating with the USBR

Notes: [1] Status will be updated throughout the EA to reflect the current condition.
BO = Biological Opinion; CWA = Clean Water Act; ESA = Endangered Species Act; MCAS = Marine Corps Air Station; NHPA = National Historic Preservation Act; SHPO = State Historic Preservation Office; USACE = U.S. Army Corps of Engineers; USBR = U.S. Bureau of Reclamation; USFWS = U.S. Fish and Wildlife Service.

1.7 ORGANIZATION OF THE ENVIRONMENTAL ASSESSMENT

Chapter 1 of this EA describes the background, purpose of, and need for the Proposed Action. Chapter 2 of this EA describes the alternatives. Chapter 3 provides a description of the affected environment and the potential direct and indirect impacts of each alternative on each environmental resource area. Chapter 4 presents the potential cumulative impacts of the Proposed Action in conjunction with the identified past, present, and reasonably foreseeable projects.

Chapter 5 provides other analyses required by NEPA (i.e., possible conflicts between the action and the objectives of federal, regional, state and local plans, polices, and controls; irreversible and irretrievable commitment of resources). Chapter 6 contains all references used in this EA. Chapter 7 provides the list of EA preparers and their qualifications. Chapter 8 presents the agencies and personnel contacted during the development of this EA. Chapter 9 is a glossary, providing a definition of terms and phrases used in this EA, as well as a description of typical training activities analyzed in this EA. The appendices contain additional information and documentation prepared in support of this EA.

CHAPTER 2
DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 OVERVIEW

The Proposed Action consists of (1) a reconfiguration and certification of static ranges and LFAM areas and improving supporting range infrastructure, and (2) an increase in the annual throughput of personnel and training events within SWATs 4 and 5 within the CMAGR. There would be no change to the existing SWATs 4 and 5 boundaries under the Proposed Action.

Under the Proposed Action, the existing static range configuration would be reconfigured to create new and improved ranges, range facilities, training capabilities, and new or improved access roads. The existing HHIA would be deactivated and repurposed following unexploded ordnance (UXO) clearance. The resulting RTAs would enhance the training efficiencies of the static ranges and would maximize the utility of the LFAM ranges, thereby optimizing training opportunities. All firing points would be located within SWATs 4 and 5. The proposed HHIA and associated surface danger zones (SDZs) would extend from the eastern boundary of SWAT 4 into the adjacent portion of the CMAGR in R-2507N.

Under the Proposed Action, changes to SWATs 4 and 5 would include:

- Reconfiguration and re-construction of the static ranges;
- Increasing the amount of area available for LFAM training within the existing SWATs 4 and 5 boundaries;
- Increasing the size and number of target areas within the existing SWATs 4 and 5 boundaries;
- Construction of new access roads and the improvement of a portion of the existing access road network;
- Creating mounted and dismounted LFAM ranges;
- Authorizing off-road driving and maneuvering by tactical vehicles in certain areas; and
- Authorizing MV-22s to land anywhere that legacy rotary-wing aircraft can operate.

Implementation of the Proposed Action would facilitate maintaining NSW, USMC, and other forces at an optimal state of readiness to support current and emerging contingency and wartime requirements. Two action alternatives meet the purpose of and need for the Proposed Action: Alternative 1 and Alternative 2; they are described in Sections 2.3 and 2.4, respectively. Alternative 2 provides the same elements as presented under Alternative 1, with the addition of enhanced training flexibility by authorizing mounted LFAM training throughout SWATs 4 and 5, unlike Alternative 1, which would constrain mounted LFAM training to specified areas. The training footprints for Alternatives 1 and 2 would be subject to environmental constraints as described in Section 2.2.

The No-Action Alternative, though not considered a reasonable alternative because it does not meet the purpose and need for the Proposed Action, provides a baseline against which the impacts of the Proposed Action can be compared. In this EA, the No-Action Alternative represents the baseline conditions described in Chapter 3, *Affected Environment and Environmental Consequences*. The No-Action Alternative and associated summary of existing training are presented in Section 2.5.

2.2 ENVIRONMENTAL RESOURCE CONSIDERATIONS

The project team reviewed the Proposed Action against several environmental considerations to develop footprints for Alternative 1 and 2 that would minimize impacts to existing resources. The resources considered are depicted on Figure 2-1 and consist of:

- Desert tortoise critical habitat
- Areas with slope greater than 30 degrees
- Cultural resources
- Water resources
- U.S. Bureau of Reclamation (USBR) water diversion berms

There is approximately 188,000 acres (76,081 ha) of critical habitat for the USFWS-designated threatened desert tortoise (*Gopherus agassizii*) within the CMAGR (USFWS 1994a). The extent of proposed training within critical habitat was minimized.

Areas with slope greater than 30 degrees are too steep for equipment and vehicles. Therefore, all areas of slope greater than 30 degrees were excluded for mounted (tactical vehicle) use and helicopter landings; however, these areas would continue to be available for dismounted (foot) activity under Alternatives 1 and 2, and the No-Action Alternative.

Several cultural resource sites are located within the project area. To minimize the potential for impacts to these known sites, protected cultural resource sites would be avoided to the extent feasible.

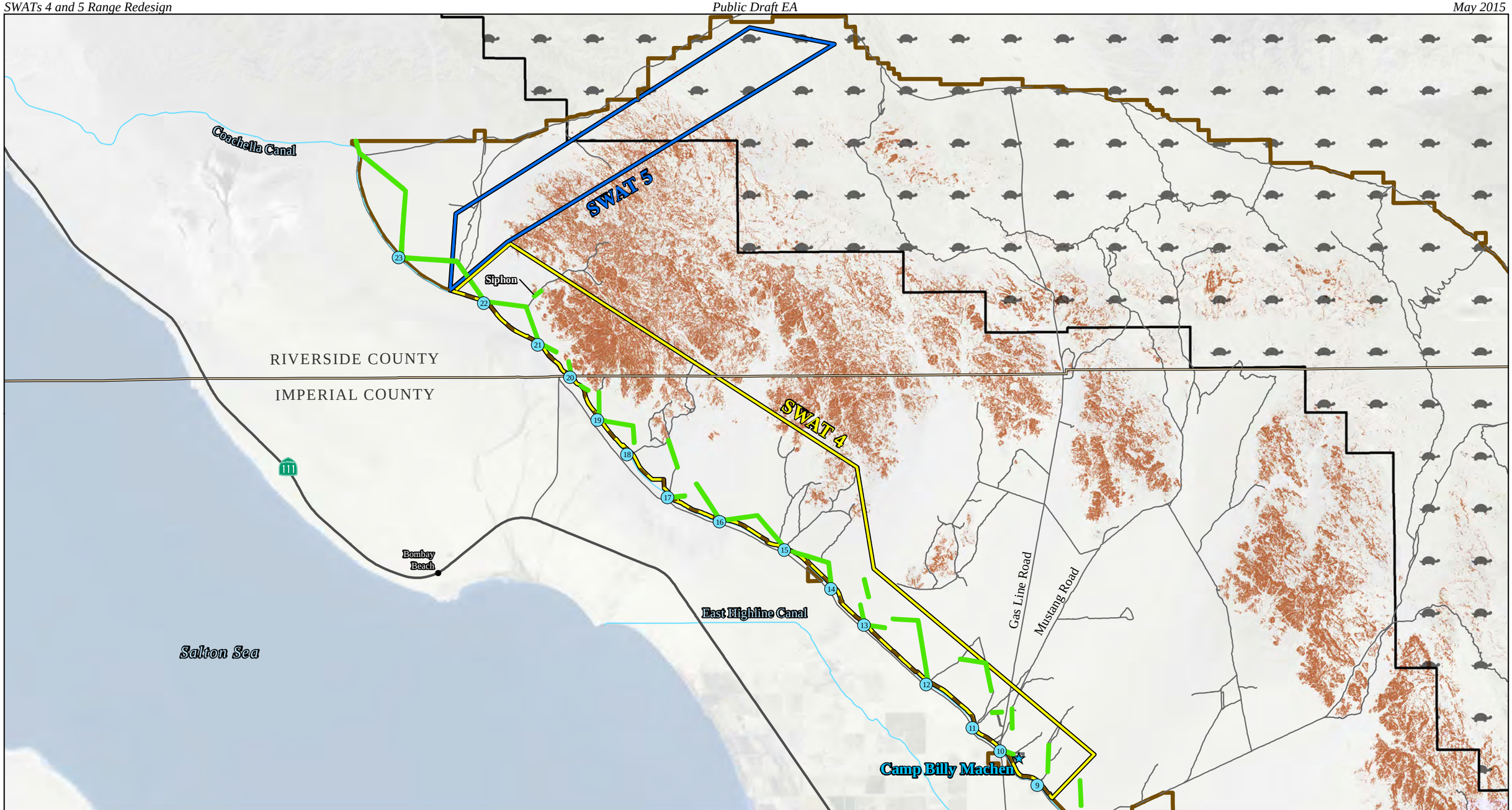
Through an iterative process, the range design team made adjustments to the range design to develop range, road, and cut/fill footprints that would minimize impacts to existing ephemeral drainages, without sacrificing training needs. The resulting proposed range design avoids impacting ephemeral drainages to the greatest extent possible.

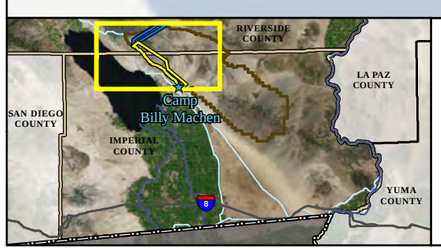
The USBR has several water diversion related structures (berms) located within SWATs 4 and 5. The project design as described under the Proposed Action would ensure the functionality of the USBR structures would not be compromised.

Figure 2-1 displays all of the environmental resources considered in the formation of alternatives except for cultural resource sites and ephemeral drainages. The locations of cultural resource sites are not presented for confidentiality reasons. Ephemeral drainages are not shown, as they would be indistinct at the scale of the figure; however, Figure 3.3-2 depicts ephemeral drainages within the project area.

2.3 ALTERNATIVE 1

This alternative would reconfigure the SWATs 4 and 5 ranges to optimize training, resulting in 11 fixed LFAM ranges (7 dismounted and 4 mounted/dismounted), 14 fixed LFAM target areas, 13 static ranges, 1 new HHIA, and the construction of new access roads (Figures 2-2 and 2-3). These operational and infrastructure optimizations would include modifications to the existing RTAs, certification of additional RTAs, and other improvements as described in the following sections. Furthermore, off-road vehicle driving and maneuvering by tactical vehicles would be authorized within SWATs 4 and 5 (subject to the constraints as identified in Section 2.2 and the avoidance, minimization and mitigation measures [AMMMs] identified in Section 2.9), and dismounted (foot) movements would continue to be authorized in all of SWATs 4 and 5. The following paragraphs summarize the proposed changes. Data summarized in the following tables are applicable to both Alternatives 1 and 2, unless otherwise noted.





Legend

- SWAT 4
- SWAT 5
- CMAGR Boundary
- Overlapping SWAT 4 and CMAGR Boundaries
- # Coachella Canal Siphon
- Canal
- County Boundary
- Highway
- Road

Environmental Constriaints

- Slope Greater than 30 Degrees
- USFWS Desert Tortoise Critical Habitat
- USBR Water Diversion Berm

Notes: All of the CMAGR is available as a landing zone for legacy rotary-wing aircraft, where safe to do so. U.S. Bureau of Reclamation linear features have been enlarged for visibility.

Figure 2-1
Environmental Resources Considered in the Development of Action Alternatives

0 1 2 Miles
0 1 2 Kilometers

Sources: USFWS 2010a; MCAS Yuma 2012, 2015; NAVFAC SW 2012

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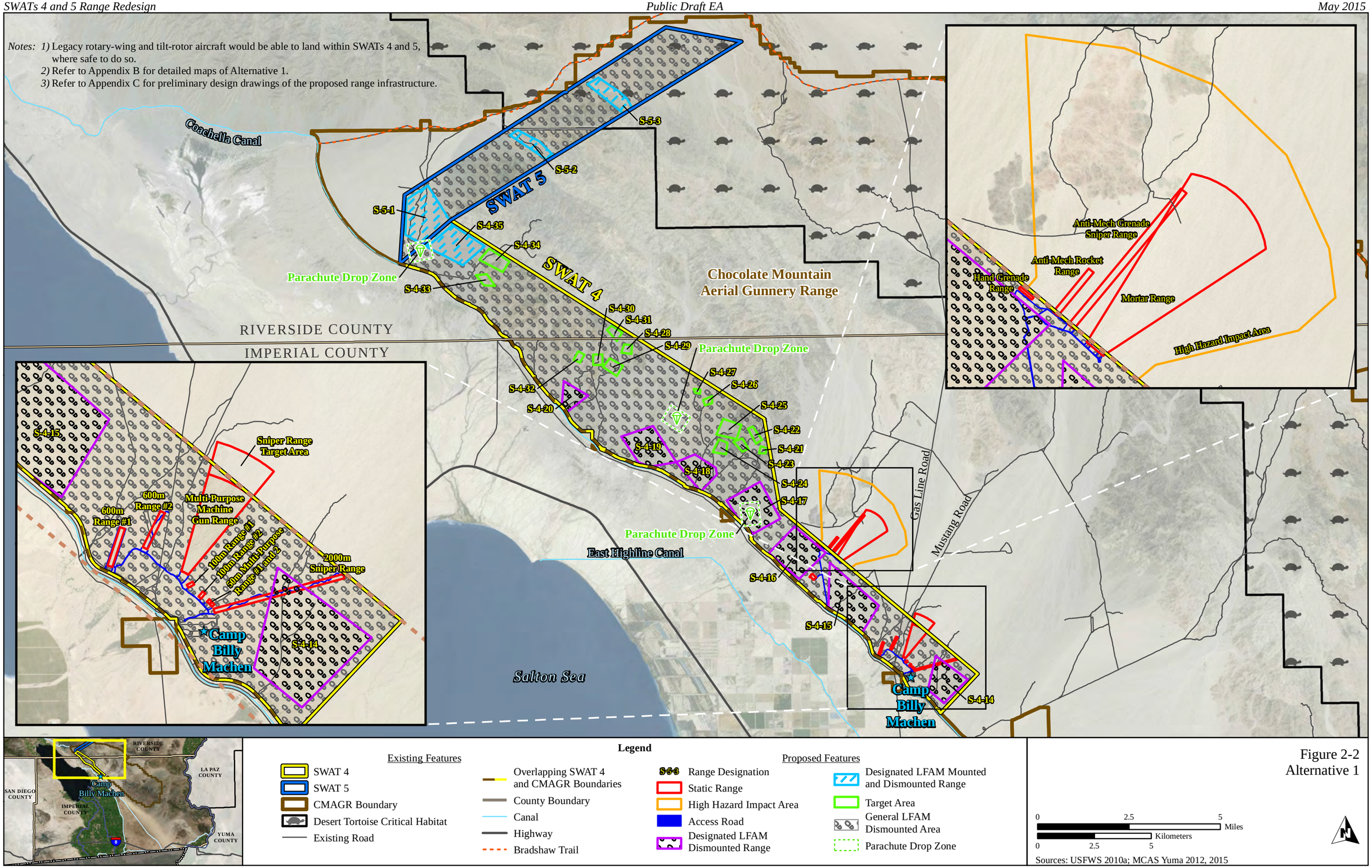

Figure 2-2
Alternative 1

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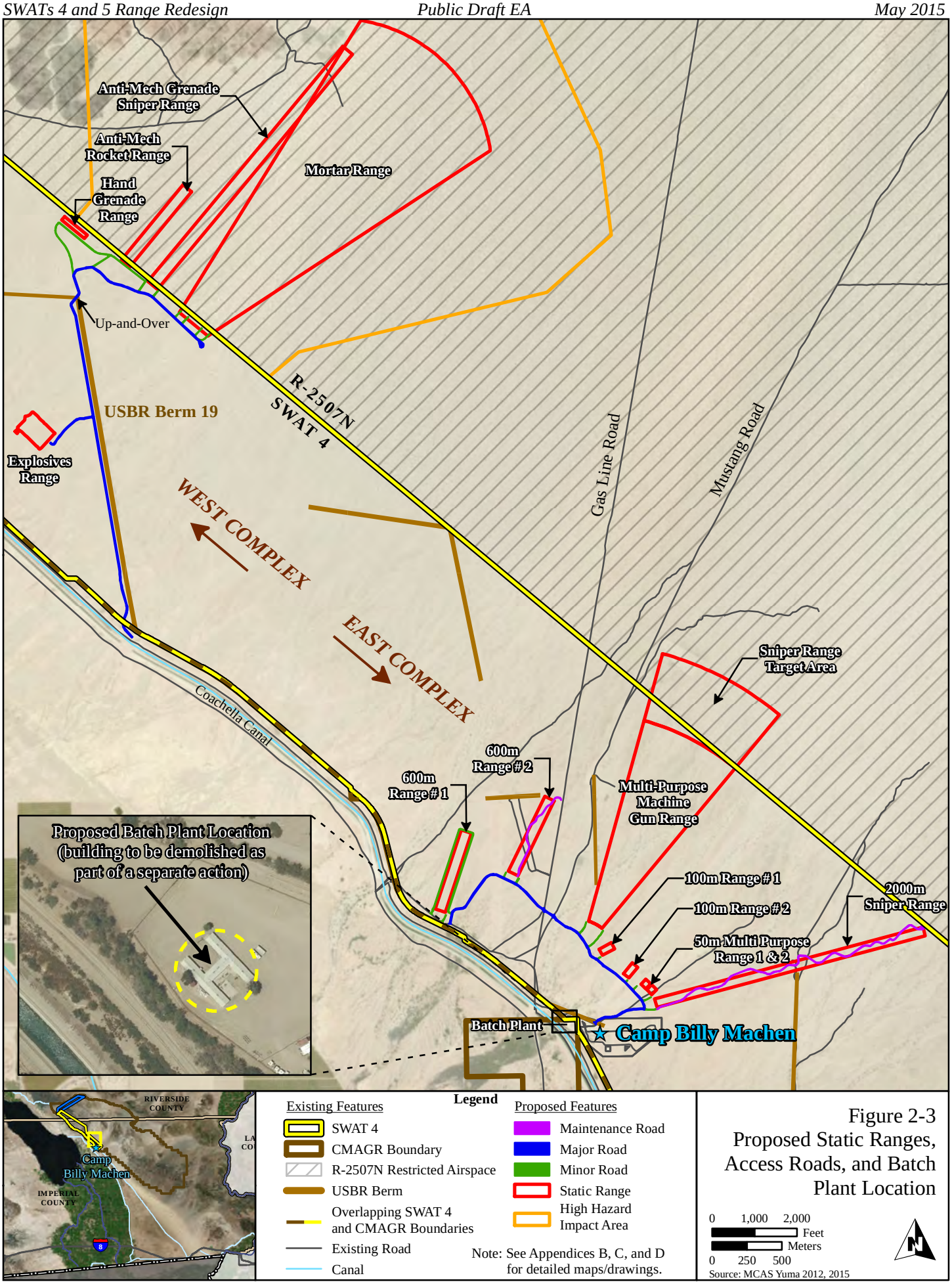

Figure 2-3
Proposed Static Ranges, Access Roads, and Batch Plant Location

2.3.1 Range Redesign and Associated Infrastructure

Implementation of Alternative 1 would redesign the existing RTAs to maximize the available training space, given the current training deficiencies discussed in Section 1.3.5. Through an iterative team effort, the USMC Training and Education Command, working with NSWC and MCAS Yuma, developed a series of proposed static and LFAM ranges designed to better support ongoing training. The outcome of the effort has identified a proposed plan that would:

- Redesign the static ranges;
- Relocate the existing HHIA;
- Redesign the RTAs to enhance the capability to conduct LFAM; and
- Designate additional LFAM ranges.

Refer to Figure 2-2 for an overview of Alternative 1. For detailed drawings of the features associated with Alternative 1, see Appendix B.

2.3.1.1 Description of Proposed Static Ranges

The proposed static ranges would be grouped into two range complexes – "East" and "West" as shown on Figure 2-3 and described in the following paragraphs.

West Complex

Explosives Training Range

The proposed explosives training range would be graded flat, though with a slight slope to facilitate the flow of stormwater runoff consistent with existing hydrology. The explosives footprint would be a 100 m by 100 m area of decomposed granite with Carsonite markers/posts affixed in each corner. The footprint would also include a concrete slab and breaching frame. An ammunition handling area with a canopy, a bunker, and a series of seven bins (with dividers) for sorting and processing debris would also be located within the range area.

Hand Grenade Range

The proposed hand grenade range would be located within the SWAT 4 boundary. Grenades would be thrown from one of two firing point locations towards targets located within a designated target polygon within the HHIA underlying R-2507N. The range would also include an ammunition handling area with a canopy, and two bunkers. Riprap would be placed directly upslope of the constructed grenade throwing pits, ammunition handling area, and bunkers to protect them from damage and erosion. Only the firing points and areas associated with the supporting range features would be graded. The grenade target area would require periodic vegetation removal for grenade throwing aimpoints, and ease of identifying, locating, and safely disposing of any dud grenades.

Anti-Mechanized Rocket Range

The proposed anti-mechanized rocket range would be located within the SWAT 4 boundary. Rounds would be fired into targets located within a designated target polygon within the HHIA underlying R-2507N. The range would include a concrete slab fronted by a shooting surface consisting of decomposed granite and an ammunition handling area with a canopy. Riprap would be placed directly upslope of the concrete slab and ammunition handling area to protect them from damage and erosion. Only the firing line and areas associated with the supporting range features would be graded; down-range

areas would not be graded but would require placement of environmentally friendly, sustainable targets. In addition, selective and periodic vegetation removal would occur for adequate visibility of targets.

Anti-Mechanized Grenade Range and Unknown Distance Sniper Range

This proposed range would be a single range but serve two purposes: anti-mechanized grenade and sniper firing. The range would be located within a designated target polygon within the HHIA underlying R-2507N. Rounds would be fired into targets located within R-2507N. The range would include a concrete slab at the firing points, a four-story tower/climbing wall, ammunition handling area with a canopy, and a storage structure. Riprap would be placed directly upslope of the concrete slab, four-store tower/climbing wall, and ammunition handling area to protect them from damage and erosion. The four-story tower would serve as a firing platform for sniper training. Only the firing line and areas associated with the supporting range features would be graded; down-range areas would not be graded but would require placement of environmentally friendly, sustainable targets. In addition, selective and periodic vegetation removal would occur for adequate visibility of targets.

Mortar Range

The proposed mortar range would be located within the SWAT 4 boundary. Rounds would be fired into targets located within a designated target polygon within the HHIA underlying R-2507N. The range would include a shooting surface consisting of decomposed granite and an ammunition handling area with a canopy. Riprap would be placed directly upslope of the constructed shooting surface and ammunition handling area to protect them from damage and erosion. Only the firing line and areas associated with the supporting range features would be graded; down-range areas would not be graded but would require placement of environmentally friendly, sustainable targets. In addition, selective and periodic vegetation removal would occur for adequate visibility of targets.

High Hazard Impact Area

While not a range, the proposed HHIA would envelop the impact area associated with the dud-producing ordnance fired from the anti-mechanized rocket/grenade and mortar ranges. The proposed HHIA would extend east from the SWAT 4 boundary underneath R-2507N. Moveable targets would be placed within a designated target polygon within the HHIA underlying R-2507N. Upon designation, the proposed HHIA would contain UXO; therefore, access would be guided by USMC range access guidance policies.

The land associated with the existing HHIA within and adjacent to SWAT 4 would be available for future training after being cleared of UXO. The existing static ranges would be graded and/or become portions of the new ranges, or they would be left as is and be available/repurposed for other training-related uses.

<u>East Complex</u>

600 Meter Known Distance Range[2]

The proposed 600 meter known distance range would include a concrete slab at the firing line and an ammunition handling area with a canopy. Riprap would be placed directly upslope of the constructed concrete slab and ammunition handling area to protect them from damage and erosion. A drivable surface (consisting of decomposed granite) would also be constructed to facilitate vehicle access to seven additional firing points. A target berm, impact berm, and seven additional firing lines would be constructed down-range. Only the firing lines and areas associated with the supporting range features

[2] The convention for measuring distance on target ranges is metric units; therefore, English unit equivalents are not provided.

would be graded; down-range areas between the firing lines would not be graded or impacted from range construction. In addition, a backstop, or "BUTTS" (an area behind the target into which the bullets impact) would be constructed. The berms would be maintained as needed for sustainment.

600 Meter Unknown Distance Range

The proposed 600 meter unknown distance range would include a concrete slab at the firing line, two storage sheds, and an ammunition handling area with a canopy. Riprap would be placed directly upslope of the constructed concrete slab, storage shed, and ammunition handling area to protect them from damage and erosion. An impact berm would be constructed down-range. In addition to disturbing soils for the construction of the firing line and areas supporting the associated described features, due to the presence of several "high areas" of soil located down-range, these "high areas" would be graded (and the material used for range construction) to provide the necessary level of down-range target visibility.

Multi-Purpose Machine Gun and Unknown Distance Sniper Range

This proposed range would be a single range but serve two purposes: machine gun and sniper firing. The range would include a concrete slab at the firing line, a four-story tower/climbing wall, and an ammunition handling area with a canopy. Riprap would be placed directly upslope of the constructed concrete slab, four-store tower/climbing wall, and ammunition handling area to protect them from damage and erosion. An impact berm would be constructed down-range. The impact berm would be maintained as needed for sustainment. In addition to disturbing soils for the construction of the firing line and areas supporting the associated described features, due to the presence of several "high areas" of soil located down-range, these "high areas" would be graded (and the material used for range construction) to provide the necessary level of down-range target visibility.

100 Meter Small Arms Ranges (2 Bays/Ranges)

These proposed ranges would be located adjacent to each other and would be identical in their size and purpose. Each range would consist of a concrete slab at the firing line, storage structures, and ammunition handling areas with canopies. Riprap would be placed directly upslope of the constructed concrete slab, storage structures, and ammunition handling areas to protect them from damage and erosion. The range footprints would be graded with a slight cross-range slope to facilitate the flow of stormwater runoff consistent with existing hydrology. An impact berm would be constructed down-range of each range and would be maintained as needed for sustainment.

50 Meter Small Arms Ranges (2 Bays/Ranges)

These proposed ranges would be adjacent to each other, separated by a ballistic wall running the length of the range. Each range would consist of a concrete slab at the firing line, storage structures, ammunition handling areas with canopies, and riprap placed directly upslope of the constructed concrete slab, storage structures, and ammunition handling areas to protect them from damage and erosion. The range footprints would be graded with a slight cross-range slope to facilitate the flow of stormwater runoff consistent with existing hydrology. An impact berm would be constructed down-range of each bay and would be maintained as needed for sustainment.

2,000 Meter Unknown Distance Range

The proposed 2,000 meter unknown distance range would include a concrete slab at the firing line, a storage structure, a four-story tower/climbing wall, and an ammunition handling area with a canopy. Riprap would be placed directly upslope of the constructed concrete slab, storage structure, four-story tower/climbing wall, and ammunition handling areas to protect them from damage and erosion. Distance

markers would be installed at varying distances down-range. In addition to disturbing soils for the construction of the firing line and areas supporting the associated described features, due to the presence of several "high areas" of soil located down-range, these "high areas" would be graded (and the material used for range construction) to provide the necessary level of down-range target visibility.

2.3.1.2 Supporting Static Range Infrastructure

Under Alternative 1, the following supporting static range support infrastructure would be constructed/installed:

- Ten concrete masonry unit block storage sheds (up to approximately 600 ft^2 [55 m^2])
- Three, four-story concrete masonry unit block/steel towers (approximately 250 ft^2 [23 m^2])
- Approximately 12,500 ft (3,800 m) of security fencing and six gates
- Eleven flagpoles
- Twelve solar beacons (to serve as range closure lighting)
- Hundreds of signs (range marking/warning signs)

The security fencing would be installed adjacent to the SWAT 4 boundary between the siphons to the west of the proposed explosives range to help keep unauthorized personnel from entering the range. Large rocks/boulders for static range protective features (i.e., riprap) would be procured from regional sources and transported via truck to the project area. Appendix C provides detailed preliminary design drawings of the proposed range infrastructure. No power or water lines would be installed to or at any of the proposed static ranges.

2.3.1.3 Cut and Borrow Areas

Based on the initial static range design, some areas within SWAT 4 need to be graded ("cut down") to provide sufficient sight lines for down-range weapons firing at targets. Additional soil is also needed to provide the necessary amount of material to construct the static range features. To meet the anticipated needs for material, several borrow sites (in addition to the range cut areas) have been identified as borrow sources. All of the borrow locations would be located in upland areas, outside of ephemeral drainages. Following removal of the borrow material, the resulting surface would approximate pre-disturbance topography – no pits would be created. In total, approximately 342,300 cubic yards of material would be cut and made available for use as borrow material.

The borrow sites would be prioritized for use, based on their proximity to the need for material and the type of source material. The identified potential borrow sites located within the existing HHIA would be used last, and only if needed. Before excavating borrow material within the existing HHIA, a UXO survey and surface-level remediation would occur within those areas of the existing HHIA that have been identified as potential borrow sources. This would occur during the second phase of construction.

2.3.1.4 Temporary Batch Plant

To facilitate the construction of the proposed range infrastructure, a temporary batch plant may be established. Also known as a concrete plant, a batch plant combines various ingredients to form concrete on-site, as opposed to trucking in ready-to-pour cement. The batch plant would be located to the west of Camp Billy Machen, within the open area near the "H" building (see Figure 2-3). Upon completion of construction, the batch plant would be demolished. This EA assumes the batch plant is constructed and used as part of the Proposed Action.

2.3.1.5 Access Roads

Three types of unpaved access roads, all of which are shown on Figure 2-3, would be constructed as part of the Proposed Action in the southern half of SWAT 4: major, minor, and maintenance roads.

Major Roads

A major road would be constructed from Siphon 12 to the proposed explosives training range and the HHIA (the West Complex), generally following the inside (protected) side of USBR Berm 19. The road would go up and over USBR Berm 19 before continuing to the proposed ranges associated with the proposed HHIA (see Figure 2-3). The "up-and-over" portion of the major road would consist of improved dirt ramps, a graded dirt surface, and protective riprap (see Sheet C-115 in Appendix C for details). Another major road would be constructed to provide access to the East Complex ranges (see Figure 2-3).

Minor and Maintenance Roads

Minor roads would be constructed off the two major roads to provide access to individual ranges within both range complexes. Two down-range maintenance roads would be delineated in support of placing targets for the 600 meter unknown distance range and the 2,000 meter sniper known distance range. No new road would be needed to obtain access to the SWAT 5 ranges or in particular, Range S-5-3. The existing Bradshaw Trail (an unpaved, graded road) would continue to be used without need for improvement. Much of the proposed static range access road network would use/improve existing roads. To improve the existing roads, a metal beam or similar item would be dragged along the existing road topography.

Road Design

All road types would consist of native material; no paved surfaces would be constructed. Impacts to ephemeral drainages would be minimized. Some road construction/improvements would result in dragging existing native material into ephemeral drainages or the placement of fill material, as needed to facilitate drainage crossing.

All three types of access roads would receive an initial application of a dust palliative (e.g., brand name "Gorilla-Snot") at construction. Post-construction, the major roads would receive re-applications of the dust palliative as needed. The dust palliative is an eco-safe, biodegradable, liquid copolymer used to provide erosion control and dust suppression. Table 2-1 summarizes the types, surfaces, and lengths of each proposed access road. Refer to Appendix C for detailed maps depicting the proposed access roads.

Table 2-1. Summary of Proposed Access Roads

Road Type	Primary Purpose	Average Width	Total Distance	Construction Method	Surface Treatment
Major	East & West Complex Access	30 ft	4.3 miles	Graded, compacted, and stabilized native soils	Dust palliative (construction and regular maintenance)
Minor	Individual Range Access	15 ft	2.2 miles	Graded, compacted, and stabilized native soils	Dust palliative (construction only)
Maintenance	Down-Range Access	15 ft	1.9 miles	Dragging	Dust palliative (construction only)

Improved Crossings

As shown in the detailed drawings (Appendices B, C, and D), several of the access roads would cross existing ephemeral drainages at approximately 10 locations. To provide the roads protection against scour and high-velocity flows and thus help ensure access to/from the ranges during or immediately following a storm event, materials would be placed directly up- and down-stream of the crossings. The materials (fill) would be A-jacks (interlocking concrete structures), gabion baskets (heavy-duty wire mesh baskets filled with rocks), "ArmorFlex" (a flexible, interlocking matrix of concrete blocks), similar materials, or a combination of these materials. Energy dissipation features (e.g., riprap) would be placed up- and down-stream of the improved crossings. This EA has analyzed the impacts associated with constructing the improved crossings.

2.3.1.6 Construction Phasing and Duration

Construction of the static range redesign elements is currently estimated to begin in fiscal year (FY) 2020. Construction would be phased to minimize the disruption to on-going training. Construction of the ranges and associated infrastructure would occur in three phases over a continuous period of approximately 24 months:

- Phase I (West Complex and temporary batch plant facility):
  - temporary batch plant facility
  - explosives training range
  - hand grenade range
  - anti-mechanized rocket range
  - anti-mechanized grenade/unknown distance sniper range
  - mortar range
  - access roads
- Phase II (East Complex):
  - 100 meter small arms ranges (2)
  - 50 meter small arms ranges (2)
  - multipurpose machine gun/sniper range
  - 2,000 meter known distance sniper range
  - access roads
- Phase III (East Complex):
  - 600 meter known and unknown distance ranges

Each phase is anticipated to last approximately 8 months; however, variations in construction duration (or seasonal restrictions) could occur due to environmental conditions. At the completion of Phase I, the existing ranges within the existing HHIA would be shut down and Phase II construction would begin. The proposed road network would be constructed in concert with the associated phased range construction activity. Construction lay-down areas would be sited away from resources (e.g., ephemeral drainages and cultural resource sites) and would be used for the staging of construction equipment and materials. At the conclusion of construction, the temporary batch plant would be decommissioned and the site returned to its pre-project condition.

Before construction of the static ranges and supporting infrastructure, a surface-level pre-construction ordnance sweep of the existing HHIA and other static range project areas subject to ground disturbance would occur. Construction ordnance monitoring would occur during construction activities within the existing HHIA.

2.3.1.7 Description of Proposed LFAM Ranges and Target Areas

Under the Proposed Action, a total of 11 fixed LFAM ranges (7 dismounted and 4 mounted/dismounted) and 14 fixed LFAM target areas would be established (Table 2-2 and see Figure 2-2). Three LFAM ranges would be established in SWAT 5 and the remaining eight LFAM ranges would be established in SWAT 4. The designated LFAM ranges would be coordinates on a map; no physical structure or other physical demarcation of the ranges would be constructed.

Table 2-2. Proposed Designated Live Fire and Maneuver Areas under Alternative 1

Number	Type and Primary Use
S-4-14	LFAM Dismounted Range
S-4-15	LFAM Dismounted Range
S-4-16	LFAM Dismounted Range/Time-on-Target Machine Gun
S-4-17	LFAM Dismounted Range/Time-on-Target Machine Gun
S-4-18	LFAM Dismounted Range
S-4-19	LFAM Dismounted Range
S-4-20	LFAM Dismounted Range
S-4-21	LFAM Target Area
S-4-22	LFAM Target Area
S-4-23	LFAM Target Area
S-4-24	LFAM Target Area
S-4-25	LFAM Target Area
S-4-26	LFAM Target Area
S-4-27	LFAM Target Area
S-4-28	LFAM Target Area
S-4-29	LFAM Target Area
S-4-30	LFAM Target Area
S-4-31	LFAM Target Area
S-4-32	LFAM Target Area
S-4-33	LFAM Target Area
S-4-34	LFAM Target Area
S-4-35	LFAM Mounted and Dismounted Range/TGM
S-5-1	LFAM Mounted and Dismounted Range/TGM
S-5-2	LFAM Mounted/Dismounted Range
S-5-3	LFAM Mounted/Dismounted Range

Range S-5-3 is the only proposed LFAM range located within desert tortoise critical habitat; other than using the Bradshaw Trail to access S-5-3 and train in S-5-3, no mounted movement is proposed within the balance of desert tortoise critical habitat located in SWAT 5. The remaining areas of SWAT 5 located within desert tortoise critical habitat would continue to be available for dismounted (foot) movement, including foot-mobile LFAM and tactical helicopter landings by legacy helicopters. In addition, all of SWAT 4 would continue to be available for dismounted (foot) movements.

The 14 LFAM target areas would be established to support the placement of structures (generally basic wood boxes/structures and/or Portable Infantry Target System [PITS] targets) to simulate various target area settings, generally typical of a village in a rural area. At each target area, anywhere from two to approximately two dozen temporary target structures would be placed. The target structures would be located on generally flat ground (no grading would be done). Plywood and similar materials would remain in the target areas. Materials of interest to scrappers (e.g., metal and the PITS) would be removed immediately after exercises.

2.3.1.8 Range Maintenance

The RTAs would be subject to periodic maintenance as needed. Explosive Ordnance Disposal (EOD) qualified personnel would periodically conduct UXO activities, and Operational Range Clearance (ORC) would occur as needed. Range targets would be replaced and/or moved as needed to support training requirements. Ancillary range maintenance/repair of fences, gates, signs, and lighting would occur when needed. Range access roads would be re-bladed/dragged/re-surfaced as needed using native materials. The major roads would receive regular surface treatments of dust palliative to control erosion and dust generation. Range impact berms would be periodically mined to recover spent bullets as part of ORC activities.

2.3.2 Description of Proposed Training

The following sections provide details on proposed NSW and USMC training. For explanations of terms and phrases used in describing training activities, refer to Chapter 9, *Glossary*. Approximately 25 percent of all training would occur on the static ranges, and approximately 75 percent of all training would occur in the LFAM ranges; however, this approximate allocation of training would fluctuate in any given year based on operational requirements.

2.3.2.1 Proposed Naval Special Warfare Land Warfare Training

NSWC estimates training tempo demand by FY 17 would be approximately 1,751 NSW personnel, an increase of approximately 28 percent from the current annual training throughput. Consistent with existing training, SWATs 4 and 5 would be used primarily by NSWG-1 for ULT and NSWCEN for SQT. SWATs 4 and 5 would also be used for other training, although to a lesser extent than proposed for SQT and ULT. Other users would include NSW Operational Test and Evaluation, EOD Mobile Unit THREE, Special Boat Teams, NSWG-2, NSWG-10, the NSW Development Group, and foreign forces. The following paragraphs provide summary descriptions of primary land warfare training activities.

<u>SEAL Qualification Training Tactical Training Events</u>

Basic weapons, lasers, and munitions use forms the initial phase of SQT land warfare training. As proficiency is gained, the focus of training shifts to small unit tactics. These more advanced training exercises include Immediate Action Drills (IADs) and target assaults. SQT training culminates with an FTX. SQT training classes (consisting of approximately 90 personnel) would be four weeks long and would be conducted six times per year. Initial SQT weapons and munitions training would involve the use of small arms at static ranges, which would transition to learning skills with basic field demolitions (shaped target charges, anti-personnel mines, booby traps, etc.) and heavy weapons (machine guns, 40 mm grenade launchers, and anti-tank weapons).

<u>Immediate Action Drills</u>

An IAD is a LFAM training exercise that teaches SQT trainees to detect, identify, and effectively react to immediate threats and perform offensive or defensive actions with live-fire using counter-ambush skills. IADs are typically conducted by an element (e.g., ranging from a two-man pair to a task unit of approximately 50 personnel) that divides into a base group and a maneuver group. IADs can also involve foot patrols along designated corridors, or may occur at helicopter and vehicle insertion/extraction points. At pre-determined points along the patrol route or at the insertion/extraction location, troops are engaged by opposition forces, which may be signaled by the activation of pyrotechnics or combat effects simulators under the control of the training cadre. Several IADs may be strung together over a wide area.

Before each IAD is initiated, a training cadre would survey the identified target area and set up targets and ambush initiation materials as required. For purposes of safety, the training cadre would plan and designate the ambush and counter-attack points such that live-fire would be directed towards the interior of the CMAGR. The training cadre would initiate and supervise the execution of the exercise and evaluate student performance and safety. Personnel would pick up training debris after the training exercise.

Field Training Exercise

An FTX is designed to test the individual and collective warfighting skills of SQT trainees. Each FTX includes: (1) insertion, (2) infiltration, (3) action at the objective, (4) exfiltration, and (5) extraction. Insertion and extraction by helicopter, tile-rotor, fixed-wing aircraft, or vehicles are essential parts of each exercise and can be performed in a variety of locations and conditions. As with an IAD, a training cadre of instructors would conduct pre-exercise surveys of the identified target area and set up targets. An FTX period would be four to five days long and would include multiple individual tactical events conducted during day or night with the training elements returning to a base of operations after each event. Approximately 60 personnel would participate in an FTX. TGM activities would also be incorporated into FTXs. Personnel would pick up training debris after the training exercise.

Unit Level Training Tactical Training Events

The ULT phase of the NSW pre-deployment training cycle reinforces/refreshes SEAL Basic Training and other skills in a tactical unit context. The training generally focuses on IADs and land warfare skills similar to those described above for SQT, but in more complex contexts and with more advanced capabilities. ULT training periods would be scheduled about eight times per year and would be conducted both day and night and involve approximately 10 to 90 personnel, depending on the training event.

Tactical Ground Mobility Sustainment Training

TGM training consists of personnel using vehicles (such as Ground Mobility Vehicles [GMVs], (High Mobility Multi-Purpose Wheeled Vehicle [HMMWV], Mine-Resistant Ambush Protected [MRAP], or a new Narrow Vehicle alternative), to conduct extractions and insertions, reconnaissance, attacks on target locations, and bivouac. Static and dynamic live-fire training would primarily occur in upper SWAT 4 and SWAT 5. NSW personnel would also practice off-loading and on-loading vehicles from rotary-wing and tilt-rotor aircraft at cleared locations.

Sniper Training

Sniper training involves refresher training for combat-ready sniper teams, which typically consist of two persons – a shooter and a spotter (who is also a qualified shooter). These sniper teams work either independently or as sniper elements supporting another tactical element. Sniper training involves sniper skills such as range estimation and marksmanship in varying terrain, cover and concealment, and reconnaissance. Most sniper training would be conducted in conjunction with ULT training exercises, but there would also be short, infrequent periods of focused sniper skill sustainment training. Sniper skills would also be practiced in the LFAM ranges and on some of the static ranges (both known and unknown distances), as well as from helicopters.

Summary of Proposed NSW Training

Table 2-3 summarizes the anticipated average annual training events conducted by the NSW within SWATs 4 and 5, as organized by general range training activity. General range training activity would be part of the specific NSW land warfare training events explained in the preceding paragraphs.

Table 2-3. Summary of Proposed Average Annual Naval Special Warfare Training Events within SWATs 4 and 5 under Alternative 1

General Range Training Activity[1]	# of Operations	Average Duration (hours)	Ranges in Concurrent Use	% at Night	Total Personnel per Event[2]
5.56 mm static	103	4	1-2	31	13-55
7.62 mm static	96	4	1	27	13-55
.50 caliber static	21	5	1	24	9-19
HELO sniping	44	5	1	50	8-12 and 2 HELOs
Explosive projectiles	119	5	1	37	14-40
Mortar	11	3.5	1	0	12
In-place demolitions	29	5	1	0	7-28
Maneuver Training	101	6	2-9	88	11-31
LFAM	385	5	2-5	38	5-19
Blank-fire and maneuver	116	18	2-4	76	15-65
Totals/Weighted Averages[3]	**1,025**	**6**	**2**	**44**	**25**

Notes: [1] General range training requirements would support proposed NSW land warfare training types as described in Section 2.3.2.1. In some instances, multiple range training activities would occur for each specific land warfare training type; thus, there is no direct correlation between specific training events and general range training activities presented in this table.
[2] Includes instructor cadre and support personnel.
[3] Weighted averages reflect a consideration for the number of events for each activity type.
HELO = helicopters.

2.3.2.2 Proposed U.S. Marine Corps Training

The following sections provide a description of proposed USMC and MARSOC training activities within SWATs 4 and 5.

Marine Aviation and Weapons Tactics Squadron One Weapons and Tactics Instructor's Course

Twice a year, for periods up to five weeks each, a Marine Corps infantry battalion (reinforced) would conduct portions of Block II and Block IV of the pre-deployment training program as described in MCO 3502.6, *Marine Corps Force Generation Process* within SWATs 4 and 5. This training would provide simultaneous support of the Marine Corps' Weapons and Tactics Instructor's Course conducted by Marine Aviation and Weapons Tactics Squadron One. The proposed collective training events represent the infantry battalions' core Mission Essential Tasks, and would involve up to 1,000 Marines and Sailors and those specific vehicles associated with a Marine Corps infantry battalion. The battalion's vehicles would have the ability to travel off-road and maneuver in LFAM areas. This training currently occurs elsewhere within the CMAGR but would occur within SWATs 4 and 5 under the Proposed Action.

Proposed training within SWATs 4 and 5 would include the employment of a task-organized infantry battalion using its organic weapons, mobility assets, and supporting arms. Supporting arms firing would occur out of SWAT 4 and/or SWAT 5 into designated target areas underlying R-2507N and/or R-2507S. Non-dud producing weapons could be fired in any of the proposed static or LFAM ranges. Dud producing ordnance would be fired only on the proposed static ranges into dedicated impact areas where ground maneuver would not be authorized. Subject to airspace operating requirements, rotary-wing and tilt-rotor aircraft would provide support to ground elements, with takeoffs and landings throughout the project area. UASs would also be employed during planned infantry battalion training, subject to airspace operating requirements. Proposed USMC training would require the use of mobile electric power generators in support of training events and while conducting inherent logistical and sustainment training.

Marine Expeditionary Unit Special Operations Capable Tactical Training Events

Marine Expeditionary Unit (MEU) Special Operations Capable (SOC) pre-deployment training would include a remote urban training scenario conducted in a portion of SWAT 4. This training would occur infrequently. The combined force would on average include (4) MV-22, (2) CH-53, (2) AH-1 and (1) UH-1 aircraft. The ground force would consist of 120 personnel. The assault target area would encompass approximately 21,500 ft^2 (2,000 m^2). There would be an associated helicopter insertion of one to two, four-person reconnaissance and surveillance teams in hide positions one to two days in advance of the assault. The assault package would land at a primary or alternate LZ scenario depending on scenario requirements. The assault force would then conduct actions in the objective area for approximately two to three hours. Between 10 and 20 personnel would also be moving in and around the area as opposing forces, with five to ten instructors present as observers. Approximately four vehicles (HMMWV and/or MRAP) would be used in the event. There would be additional helicopter landings to simulate casualty evacuations. In total, the event would cover a period of three days and include approximately 150 personnel, 15 aircraft landings, and multiple vehicles.

Infantry Battalion Training Events

Marine Corps units, primarily from the west coast, would periodically deploy rifle companies to SWATs 4 and 5 for crew and unit-level mission-essential ground combat sustainment training. The units are anticipated to be no larger than 250 Marines, primarily employing weapons and those specific vehicles assigned to a Marine Corps infantry battalion. Each event would last approximately 14 days. The battalion's vehicles would have the ability to travel off-road and maneuver in LFAM areas.

Proposed USMC training would include use of all infantry battalion weapons. Non-dud producing weapons could be fired in any of the proposed static or LFAM ranges. Dud producing ordnance would be fired only on the proposed static ranges into dedicated impact areas where ground maneuver would not be authorized. Subject to airspace operating requirements, rotary-wing and tilt-rotor aircraft would provide support to ground elements, with takeoffs and landings throughout the project area. UASs would also be employed during planned infantry battalion training, subject to airspace operating requirements. The USMC would use generators in support of training events.

MARSOC Tactical Training Events

MARSOC pre-deployment training cycle would reinforce/refresh Marine SOF Basic Training and other skills in a tactical unit context. The training would be infrequent and would generally focus on IADs and ground warfare skills similar to those described above for NSW SQT.

2.3.2.3 Authorized Weapons and Ordnance

A range of weapons and ordnance would be authorized for use in SWATs 4 and 5 under Alternative 1, including:

- Pyrotechnics
- Battlefield effects simulators
- Lasers
- Direct fire anti-personnel weapons
- Defilade (indirect fire) weapons
- Direct fire anti-mechanized equipment weapons
- Demolitions (anti-personnel).

Proposed ordnance would be generally similar to that identified in the CMAGR Legislative Environmental Impact Statement (EIS) (DoN 2013). Table 2-4 lists weapons and ammunition used by NSW within SWATs 4 and 5. New weapons and ammunition that are required for training and/or testing within SWATs 4 and 5 that are not listed on Table 2-4 would be approved for training by the Commanding Officer, MCAS Yuma and would comply with MCO 3570.1C, *Range Safety*. Lasers would be used, consistent with DoN safety regulations and MCAS Yuma range standard operating procedures. All SDZs would be wholly contained within the CMAGR boundary and overlying SUA, in accordance with MCO 3570.1C, *Range Safety*.

Table 2-4. Proposed Weapons for Use within SWATs 4 and 5 under Alternatives 1 and 2

Category	Weapon/Employment Method(s) and Caliber
Pyrotechnics	*Hand, M203, M79, Mortar, M3 Carl Gustav* – various
Small Arms	*Pistol* – Up to and including .45 caliber
	Shotgun – Up to and including 12 gauge
	Rifle – Up to and including .300 Win Mag
	Sub-Machine Gun – 9 mm, .45 caliber
	Machine Gun –.45 caliber, .30 caliber, 7.62 mm, .50 caliber
	Heavy Barreled Machine Gun – .50 caliber
	Sniper – Rifles up to and including .50 caliber
	Grenade (hand or grenade launcher) – 40 mm
Heavy Weapons	*MK19, MK47, Belted Grenade Launcher* – 40 mm
	Mortars – 60 mm, 81 mm
	M220 TOW – 5.8 inches
	M72 LAAW (HEAT), NLAAW (HEAT) – 66 mm
	M136 AT4 (HEAT CS HP), M3 Carl Gustav – 84 mm
Demolitions	*Hand Grenades* – various
	Demolition – C-4, etc.
	Anti-Personnel Mines – M18, M18A1 Claymore

Notes: MK = Mark; TOW = tube launched, optically tracked wire-guided missile; LAAW = light anti-armor weapons; NLAAW = next generation light anti-armor weapons; HEAT = high explosive anti-tank; CS HP = confined space high penetration.

Estimated annual ordnance expenditures from proposed training activities are summarized in Table 2-5. Proposed ordnance expenditures are presented as anticipated annual averages for all users. As year-to-year training requirements change, any given year may result in more or less ordnance use. Ground-based ordnance with a substantial vertical element (i.e., mortars) would continue to be used in accordance with current airspace requirements associated with the existing Niland and Bombay CFAs and R-2507N. High explosive or dud producing ordnance would only be fired at authorized locations.

Table 2-5. Estimated Annual Ordnance Expenditures within SWATs 4 and 5 under Alternatives 1 and 2

Category	Description	Total (rounds)
Pyrotechnics	Smokes, flares, illumination, "flash-bangs," thermal, etc.	47,000
Small Arms	5.56 mm ball (1/5 are tracer)	11,815,600
	7.62 mm ball (1/5 are tracer)	8,363,300
	9 mm	30,000
	.50 caliber	306,020
	Hand Grenades	1,510
Heavy Weapons	40 mm and TP grenades (via grenade launcher)	126,660
	60 mm Mortar	12,330
	81 mm Mortar	12,000
	84 mm M3 Karl Gustav	1,760
	LAAW	980
Demolitions	Anti-personnel mines (Claymores)	480
	Demolition blocks/shaped charges (2.5 pounds NEW maximum)	1,620
	Demolition blocks/shaped charges (50 pounds NEW maximum)	88
	Detonating cord (all types; in feet)	64,000

Notes: LAAW = light anti-armor weapons; NEW = net explosive weight; TP = training/practice.

2.3.2.4 Range Command and Coordination

All training within SWATs 4 and 5 would be conducted in accordance with USMC, Marine Corps Installations West, and MCAS Yuma range safety policies. In addition, training conducted by NSWC units/personnel would be conducted in accordance with NSWC range safety policies. In the event of a conflict, the most restrictive safety regulations would apply.

2.3.2.5 Aircraft Operations

Annual Operation Hours

Under Alternative 1, there would be an increase in fixed- and rotary-wing aircraft operations over SWATs 4 and 5 in support of ground training (Table 2-6). Proposed aircraft operations would be consistent with the airspace requirements associated with CFAs; there would be no change to the existing structure of the overlying Niland and Bombay CFAs[3]. In addition, increases in UAS operations in support of ground training would comply with airspace use regulations applicable to UAS activities within SWATs 4 and 5.

[3] A separate NEPA document has been prepared to analyze the proposed establishment of Restricted Airspace R-2507W above SWATs 4 and 5 (NAVFAC SW 2014a).

Table 2-6. Proposed Total Annual Aircraft Operation Hours and Landings and Take Offs in Support of Ground Training Activities under Alternatives 1 and 2

Aircraft Type	Proposed (hours)	Proposed (LTOs[1])
HH-60	336	0
CH-46/MV-22	120	192
CH-53	120	192
AH-1	120	48
UH-1	240	192
KC-130[a]	4	NA
RQ-7[b]	17[c]	NA
Puma[b]	44[c]	NA

Notes: [1] LTOs = Landings and Take Offs; NA = not applicable.
[a] Fixed-wing aircraft; all others except "b" are rotary-wing; however, the MV-22 is a tilt-rotor aircraft that can operate in both rotary and fixed-wing modes.
[b] UAS.
[c] Number of proposed annual sorties, which is defined as one flight training mission conducted by a single aircraft in one airspace unit.

Landing Zones

Under the Proposed Action, the ability to continue to land legacy rotary-wing aircraft anywhere within SWATs 4 and 5 would be retained. In addition, MV-22 aircraft would be able to land throughout SWATs 4 and 5 in a tactical, random, and dispersed manner, subject to environmental constraints, and consistent with legacy rotary-wing aircraft operations. This training would support real world mission simulation of inserting troops in combat areas. Based on the scenario and training criteria, inserting randomly throughout SWATs 4 and 5 provides the variation to meet training requirements. As such, MV-22 landings would not be restricted to established LZs; however, no new LZs would be constructed under the Proposed Action. There are no permanent facilities identified, nor required for the MV-22 as part of the Proposed Action.

The MV-22 would land only in areas that have been determined to be safe by MV-22 aircrews and in accordance with MCAS Yuma and NSW range safety policies, and the AMMMs identified in Section 2.9. The majority of MV-22 landings would occur within SWAT 4. This is because due to the topography (prevalence of steep slopes) within SWAT 5, there is not much available potential landing area. The few MV-22 landings that would happen in SWAT 5 would occur in the primary wash area along the designated vehicle movement roads. No MV-22 landings would occur within desert tortoise critical habitat.

Drop Zones

As depicted on Figure 2-2, three parachute drop zones (DZs) measuring approximately 3,280 ft by 26,250 ft (1,000 m by 8,000 m) would be designated. The DZs would use the ground "as is;" no improvement to the ground surface would occur. If a future need for additional DZs is identified, the DZ(s) would be established unless otherwise restricted by operational factors or identified AMMMs in Section 2.9. Any additional future DZs would conform to the authorization and operating requirements identified in Air Force Instruction 13-217, *Drop Zone and Landing Zone Operations* (U.S. Air Force 2007). The three proposed, as well as any additional DZs, would comply with the following conditions:

- No concrete pads or other permanent structures would be constructed;
- DZ use would be restricted to personnel and their gear at a maximum combined weight of 300 pounds (136 kilograms); no vehicles would be air-dropped;
- All DZ-related materials and gear (e.g., parachutes) would be packed out by personnel; and

- Helicopters would respond to any medical DZ-related emergencies in remote areas.

2.4 ALTERNATIVE 2

Alternative 2 consists of the same range reconfiguration construction and an increase in training as presented under Alternative 1, with the addition of enhanced training flexibility by authorizing mounted and dismounted LFAM training over the remaining areas of SWATs 4 and 5 (Figure 2-4). The "remaining areas" consist of those areas of SWATs 4 and 5 not proposed as distinct RTAs and not subject to environmental constraints. While the majority of vehicle driving would occur on existing or proposed roads, under Alternative 2, off-road vehicle driving within SWATs 4 and 5 would occur. The designated dismounted LFAM areas identified under Alternative 1 would remain as such under Alternative 2 and would not be subject to vehicle traffic; this would retain these LFAM areas as relatively "undisturbed areas" essential to NSW training.

As is the case under Alternative 1, SWATs 4 and 5 would be reconfigured to optimize training, resulting in 11 fixed LFAM areas (7 dismounted and 4 mounted/dismounted), 14 fixed LFAM target areas, 13 static ranges, and 1 HHIA. Operational and infrastructure upgrades or improvements would include modifications to the existing ranges, certification of additional ranges, and other improvements. Alternative 2 would also include the ability to land rotary-wing aircraft throughout SWATs 4 and 5. MV-22 aircraft would only be able to land at designated LZs. Furthermore, off-road vehicle driving and maneuvering by tactical vehicles would be authorized within SWATs 4 and 5, subject to the AMMMs identified in Section 2.9. Dismounted (foot) movements would continue to be authorized in all of SWATs 4 and 5. Refer to the tables presented under Alternative 1 in Section 2.3 for training details associated with Alternative 2.

Under Alternative 2, personnel would have a larger area to conduct mounted LFAM training as compared to Alternative 1, providing greater flexibility for training activities. Within this mounted/dismounted LFAM area, temporary, discrete LFAM ranges would be established as needed to aid in the command and control of multiple training activities, typically on an exercise-specific (temporary) basis. Assuming the temporary and discrete LFAM ranges conformed to the analysis contained within this EA, no additional NEPA analysis would be required. Appendix D contains detailed maps of Alternative 2.

2.5 NO-ACTION ALTERNATIVE

For the purposes of this EA, "no action" means that training would continue at existing levels and in existing ranges/maneuver areas. Consequently, the potential training benefits of SWATs 4 and 5 would not be realized. This situation would continue to affect the ability for forces to achieve additional enhanced training requirements. The No-Action Alternative is included as a baseline for comparison to all action alternatives for determining project effects.

Table 2-7 summarizes existing average annual NSW training events within SWAT 4 that would be maintained under the No-Action Alternative. Training events can last from just a few hours to several days, and may involve from just a few to dozens of personnel. In addition, many training activities occur at night and cover multiple ranges. Consistent with existing conditions, SWAT 5 would not be used for training under the No-Action Alternative. In addition, the USMC would continue to conduct training within SWAT 4 consistent with activities described in the 2013 CMAGR Legislative EIS (DoN 2013).

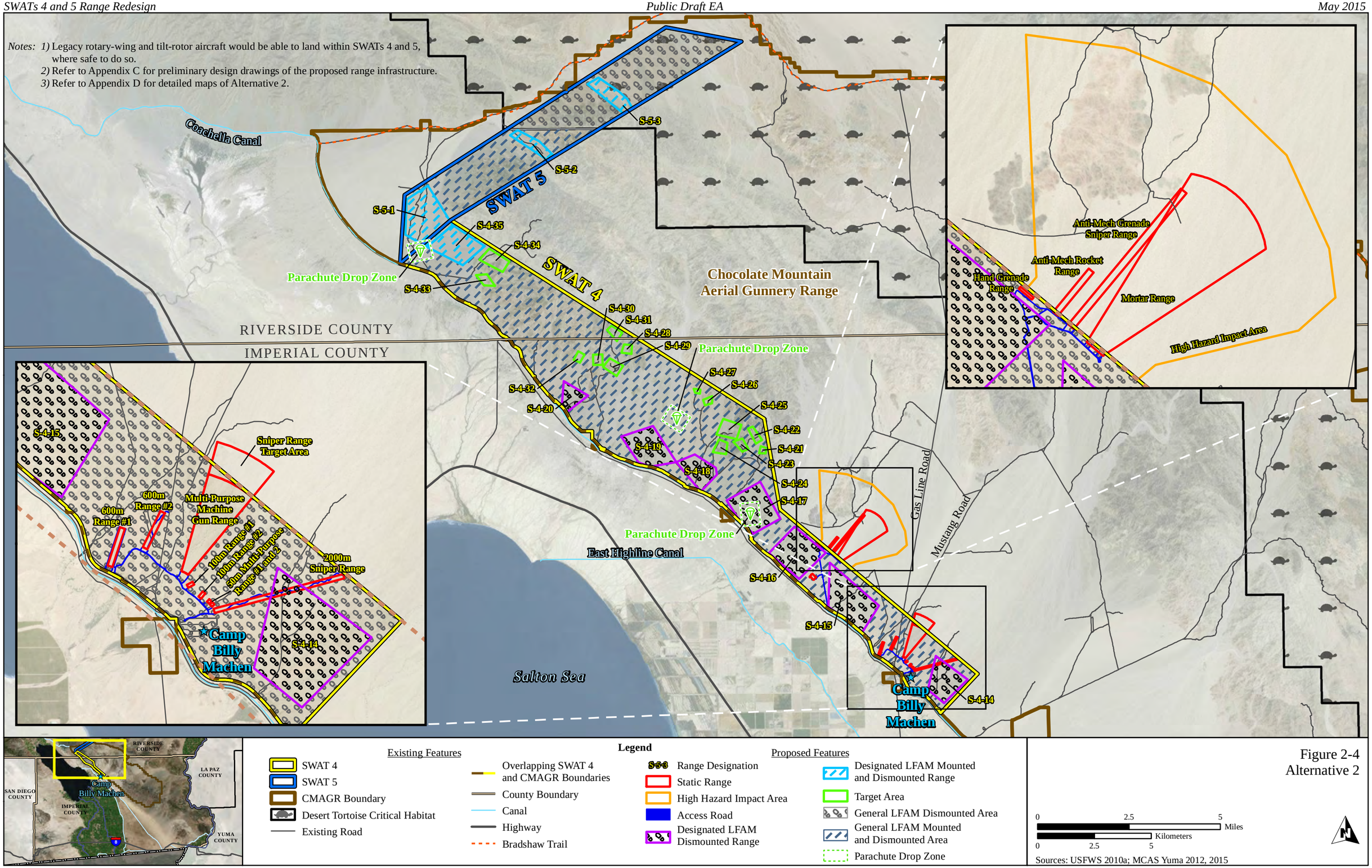

Figure 2-4
Alternative 2

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Table 2-7. Summary of Existing Average Annual Naval Special Warfare Training Events within SWAT 4 That Would Continue under the No-Action Alternative

General Range Training Activity[1]	# of Events	Average Duration (hours)	Ranges in Concurrent Use	% at Night	Total Personnel per Events[2]
5.56 mm static	99	4	1-2	36	13-26
7.62 mm static	90	4	1	33	13-26
.50 caliber static	21	4.5	1	24	18-19
HELO sniping	6	4.5	1	50	8-12 and 2 HELOs
Explosive projectiles	19	4.5	1	41	16-18
Mortar	9	3.5	1	0	12
In-place demolitions	27	4	1	0	6-23
Dry-fire and maneuver	87	5	2-9	86	11-22
LFAM	318	4.5	2-5	37	5-22
Blank-fire and maneuver	42	14	2-3	74	15-35
Totals/Weighted Averages[3]	**718**	**5**	**2**	**42**	**20**

Notes: [1] General range training requirements would support proposed NSW land warfare training events as described in Section 2.3.2.1. In some instances, multiple range training activities would occur for each specific land warfare training event.
[2] Includes instructor cadre and support personnel.
[3] Weighted averages reflect a consideration for the number of events for each activity type.
HELO = helicopter.

Table 2-8 approximates the average annual amount of ordnance expended in the course of existing NSW training activities within SWAT 4. In addition, on average, 72 hours' worth of helicopter operations (HH-60) and approximately 53 low-level UAS operations occur on an annual basis. UAS operations occur in compliance with requirements as contained in the USMC Safety of Use Memorandum (USMC 2008a). Personnel use a variety of ground vehicles on existing roads either as part of training activities and/or to access RTAs.

Table 2-8. Summary of Existing Average Annual Naval Special Warfare Ordnance Expenditures within SWAT 4 under the No-Action Alternative

Category	Description	Total (rounds)
Pyrotechnics	Smokes, flares, illumination, flash-bangs, thermal, etc.	38,820
Small Arms	5.56 mm ball (1/5 are tracer)	2,803,306
	7.62 mm ball (1/5 are tracer)	2,788,370
	9 mm	10,000
	.50 caliber	94,944
	Hand Grenades	784
Heavy Weapons	40 mm and TP grenades (via grenade launcher)	23,992
	60 mm mortar	2,187
	84 mm M3 Karl Gustav	1,162
	LAAW	568
Demolitions	Anti-personnel mines (Claymores)	360
	Demolition blocks/shaped charges (2.5 pounds NEW maximum)	1,080
	Demolition blocks/shaped charges (50 pounds NEW maximum)	72
	Detonating cord (all types, in ft)	54,000

Notes: LAAW = light anti-armor weapons; NEW = net explosive weight; TP = training/practice.

2.6 COMPARISON OF ALTERNATIVES

Table 2-9 summarizes the differences in annual NSW training between the No-Action Alternative (existing conditions) and Alternatives 1 and 2 (Proposed Action).

Table 2-9. Summary of Proposed Changes in Annual NSW Training Activities under Alternatives 1 and 2

Training Type	No-Action Alternative	Alternatives 1 and 2	Approximate Average Change (%)
Annual NSW Personnel Throughput	1,371	1,751	380 (28)
Annual NSW Training Events	718	1,025	307 (43)
NSW Training Events at Night (percent)	42	44	2 (5)
Average NSW Training Events Duration (hours)	5	6	1 (17)

In addition, as qualitatively described in Section 2.3.2.2, there would be an increase in USMC training under Alternatives 1 and 2 as compared to current conditions. Table 2-10 summarizes the differences between NSW and USMC annual aircraft operation hours under the No-Action Alternative (existing conditions) and Alternative 1 and 2 (Proposed Action).

Table 2-10. Proposed Increase in Total Annual Aircraft Operation Hours under Alternatives 1 and 2

Aircraft Type	No-Action Alternative (hours)	Alternatives 1 and 2 (hours)	Change (hours)
HH-60	72	336	264
CH-46/MV-22	0	120	120
CH-53	0	120	120
AH-1	0	120	120
UH-1	0	240	240
KC-130	0	4	4

2.7 ALTERNATIVES CONSIDERED BUT ELIMINATED

2.7.1 Others Areas within the CMAGR

Re-locating ground warfare training activities as described under the Proposed Action to the CMAGR, but outside of SWATs 4 and 5, would be incompatible with existing air-to-ground training within other areas of the CMAGR. Furthermore, SWATs 4 and 5 represent the recognized and established land warfare training areas for NSW forces. Therefore, developing a potential range redesign alternative within the CMAGR and outside of SWATs 4 and 5 was eliminated as a potential alternative.

2.7.2 Alternative Range Training Area Configurations within SWATs 4 and 5

Several range redesign concepts (Range Design Options 1 through 4) were identified; however, portions of each initial static range layout would have resulted in unacceptable SDZ overlaps with existing and/or proposed RTAs. In addition, the initial range design concepts were also constrained by topography and in parts, adjacent non-DoD land uses, further restricting the conceptual design framework that would facilitate achievement of training objectives through a relatively small area. Therefore, following an

iterative design process involving the entire project team, these potential alternatives (Range Design Options 1 through 4) were eliminated as potential alternatives in this EA.

From this initial "high-level" layout of the RTAs, a workable overall layout was identified. This workable layout of the ranges was then subject to several detailed static range-specific revisions to minimize impacts to resources within the project area. For example, following the completion of cultural and jurisdictional delineation surveys and on-the-ground investigations of topography and site conditions, the individual static ranges and associated features (structures, roads, etc.) were further adjusted such that the design would either completely avoid, or at a minimum, minimize impacts to resources. A multidisciplinary team (consisting of range designers, range training officers, engineers, and environmental professionals) effectively reduced potential impacts to the extent possible without sacrificing operational training needs, and is as depicted in Alternatives 1 and 2.

2.8 PREFERRED ALTERNATIVE

The USMC has identified Alternative 2 as the Preferred Alternative for implementation of the Proposed Action.

2.9 AVOIDANCE, MINIMIZATION, AND MITIGATION MEASURES

The following AMMMs (organized by resource area) have been developed to avoid or minimize the potential environmental consequences of the Proposed Action. These AMMMs would be incorporated into the final design and implemented as part of the Proposed Action.

2.9.1 Geology and Soils

1) Tire-cleaning measures such as stabilized construction entrance/exit designs (e.g., metal corrugated shaker plates, gravel strips, and/or wheel-washing sites) would be installed at access points.
2) All erosion and sediment control measures would be inspected to ensure proper integrity and function during the entire construction period. All stabilization and structural controls would be inspected at least monthly or after any significant storm event for the duration of the construction activities; any damage would be repaired, and the controls would be maintained for optimum performance.
3) Any disturbed slopes or other graded features would be properly stabilized.
4) Following the grading of "high areas," the resulting surfaces (topography) would be graded to approximate pre-disturbance topography, as practicable.
5) An operations and maintenance program would be implemented to ensure the continued effectiveness of post-construction Best Management Practices (BMPs) once construction is completed.
6) All three types of access roads would receive an initial application of a dust palliative at construction. Post-construction, the major roads would receive re-applications of the dust palliative.

2.9.2 Water Resources

1) Construction would be conducted in compliance with the anticipated Construction General Permit conditions and associated BMPs.
2) Construction would be conducted in compliance with anticipated CWA permit conditions.
3) Before construction, a Stormwater Pollution Prevention Plan (SWPPP) would be prepared in accordance with the Construction General Permit. The SWPPP would include BMPs for erosion and sedimentation controls, including techniques to diffuse and slow the velocity of stormwater. In addition, as part of the Grading Plan, an Erosion Control Plan would be prepared to include standard erosion control measures to reduce potential impacts (e.g., soil loss and sedimentation) to water quality during construction. A Notice of Intent would be submitted to the Regional Water Quality Control Board (RWQCB), and a copy of the SWPPP would be kept at the construction site. The MCAS Yuma Range Management Department would oversee implementation and enforcement of the SWPPP. All construction activities with the potential of impacting water quality due to runoff would be conducted in accordance with SWPPP requirements. SWPPP BMPs may include, but would not be limited to, erosion, sedimentation, and stormwater control measures such as sandbags, silt fences, earthen berms, fiber rolls, sediment traps, straw bale dikes, erosion control blankets, check dams in medium-sized channels, or straw bale dikes in smaller drain channels.

2.9.3 Biological Resources

The Proposed Action would include the measures provided below to minimize potential effects on biological resources, particularly the desert tortoise. These measures are based upon review of potential project effects and the incorporation of applicable terms and conditions from previous consultations with the USFWS addressing similar actions and the desert tortoise, including the Biological Opinion (BO) for the Military Use of the CMAGR, CA (1-6-96-F-40) (USFWS 1996) and the Target Complex Invader, Chocolate Mountain Aerial Gunnery Range Final Biological Assessment (BA) (NAVFAC SW 2015). The measures outlined in this EA are intended to reduce the potential for death or injury to individual tortoises, reduce or minimize negative impacts on tortoise habitat, and monitor population trends.

1) The MCAS Yuma Tortoise Management Representative within the Range Management Department would ensure compliance with protective stipulations by all users of SWATs 4 and 5. This representative has the authority to halt activities that may be in violation of such provisions. The Tortoise Management Representative also would coordinate with the designated USFWS representative on all matters concerning desert tortoise mitigation and management responsibilities. The Tortoise Management Representative does not have to be a qualified desert tortoise biologist and therefore would receive instructions from a qualified desert tortoise biologist in the handling, data collection, and release procedures for desert tortoise prior to engaging in such activities. MCAS Yuma would submit the name(s) and credentials of the person(s) that would be the Tortoise Management Representative or appointee(s). Only qualified desert tortoise biologists, the Tortoise Management Representative, or appointees (‘appointee’ is defined as a person having the same qualifications as the Tortoise Management Representative) would handle desert tortoises.
2) All personnel accessing the CMAGR would participate in MCAS Yuma’s existing tortoise education program, which has been developed cooperatively with the USFWS. The program

would include, at a minimum, the following topics: (1) occurrence of the desert tortoise; (2) sensitivity of the species to human activities; (3) legal protection for desert tortoises; (4) penalties for violations of federal law; (5) general tortoise ecology and activity patterns; (6) reporting requirements; (7) measures to protect tortoises; (8) personal measures that users can take to promote the conservation of desert tortoises; and (9) procedures and a point of contact if a desert tortoise is observed on site. All users of SWATs 4 and 5 would be informed of their responsibility to report any form of take to the Tortoise Management Representative.

3) All personnel accessing the CMAGR would be informed of their responsibility to report any form of take to the Tortoise Management Representative. If a tortoise is found in a project site, activities may, if appropriate, be modified to avoid injuring or harming it and MCAS Yuma Tortoise Management Representative shall be contacted immediately.

4) Range Management personnel would be responsible for periodically reminding all personnel of the protective measures for tortoises.

5) Desert Tortoise Handling Procedures

    a. Only biologists authorized by the USFWS shall handle desert tortoises, except in circumstances in which the life of the desert tortoise is in immediate danger (see item 5d, below). For biologists not already authorized, MCAS Yuma shall submit their credentials to the USFWS for review and approval at least 30 days before the initiation of any activity within desert tortoise habitat.

    b. Desert tortoises shall be moved only by an authorized biologist and solely for the purpose of moving the animals out of harm's way. Desert tortoises shall be moved the minimum distance to ensure their safety.

    c. All handling of tortoises and their eggs and excavation of burrows are to be conducted by an authorized biologist in accordance with up-to-date protocols accessed at the USFWS website (http://www.fws.gov/ventura/endangered/species/surveys-protocol.html).

    d. If an emergency situation exists, and a tortoise must be moved out of immediate danger, the animal may be moved to an adjacent shaded area (normally plant cover) out of direct sunlight. Desert tortoises shall only be moved the minimum distance to ensure their safety. Range Management shall be notified.

6) An annual monitoring report would be prepared and delivered to the USFWS on or before January 15 of each year. The report would briefly outline the effectiveness of the desert tortoise mitigation measures and summarize desert tortoise injuries or mortalities. To enhance desert tortoise protection, the report would make recommendations for modifying or refining existing measures.

7) The project area would be included in the rotation of ranges that are currently surveyed during ongoing annual surveys at the CMAGR (as funds are available). Surveys are conducted using the USFWS-recommended methods by qualified desert tortoise biologists. Surveys are conducted within existing safety protocols and mission parameters at the designated target area(s) within the CMAGR during regularly schedule range closures in the spring and all data are collected and entered into the MCAS Yuma Geographic Information System database. The results of monitoring are included in the annual monitoring report prepared by MCAS Yuma and delivered

to the USFWS on or before January 15 of each year. Any changes in survey methodology would be reported to the USFWS in an annual monitoring report.

8) In accordance with the existing BO for the CMAGR (1-6-95-F-40; USFWS 1996), the boundaries of the new construction or other ground-disturbing activity would be determined in the field, mapped, and marked with monuments prior to initial target placement. New construction or other ground-disturbing activity would be placed outside of and away from surface drainages, where feasible. All new construction or other ground-disturbing activity would be within the designated boundaries. Clearance surveys conforming to USFWS recommendations would be followed for the initial siting of all construction or other ground-disturbing activity. A qualified desert tortoise biologist or the Tortoise Management Representative would also be on-site during initial target placement.

9) An approved desert tortoise biologist would be "on-call"/available during construction to address the situation if a desert tortoise is encountered. The MCAS Yuma Range Management Department would provide the USFWS the name(s) and qualifications of the biologist(s) for review and approval.

10) Any excavations associated with construction and maintenance that would be left open in areas that are not being monitored shall either be fenced temporarily to exclude desert tortoises, covered at the close of each work day, or provided with ramps so desert tortoises can escape. All excavations shall be inspected for desert tortoises before filling.

11) A tortoise exclusion fence would be installed around each construction site before construction. A qualified desert tortoise monitor would be present during the initial activity at each construction site. Once a tortoise fence is installed around each construction site and the clearance surveys are completed, the monitor would no longer need to be present at the site. If a tortoise is found in the project area during construction activities, the tortoise would be allowed to move away on its own free would or would be safely moved by an approved desert tortoise biologist. Following construction, the tortoise fences would be removed.

12) All personnel conducting service road construction, construction/training activities, and operational range clearance (e.g., EOD personnel) would monitor 'take' as part of their sweeps of activity areas. Personnel would report to the Tortoise Management Representative any injured or dead tortoises located, as well as habitat damage outside of the designated activity area. Personnel would fill out a form after construction/training activities and EOD clearance activities, reporting any take. The Tortoise Management Representative (or appointee) would be present during all construction and EOD clearance activities and available to respond to individual EOD and range maintenance crews (who would be trained per Measures 2 and 3) in the event the crews observe tortoise mortality/take, habitat damage, or need to have a tortoise relocated.

13) The project proponent would designate a Field Contact Representative (FCR) once ground clearing is completed and the desert tortoise fences are installed. The FCR would be responsible for overseeing compliance with biological resources conservation measures and any other required terms and conditions resulting from consultation between the USMC and USFWS. The FCR would be on-site during all construction activities. The FCR would have a copy of all avoidance and minimization measures during construction activities. The FCR may be a crew chief, field supervisor, project manager, or a contracted biologist. The FCR would have the authority to halt construction, operation, or maintenance activities that are in violation of these

requirements. A representative from MCAS Yuma Range Management Department would make bi-weekly visits to ensure compliance.

14) Boundaries of all target sites, existing and proposed, would be determined in the field, mapped, and flagged. All new target constructions would be placed within the boundaries of the designated target site. An on-site tortoise monitor would be present during target placement.

15) Roads would conform to the natural contour of the land as much as possible to minimize grading, and would avoid existing perennial plants as much as possible.

16) Vehicles traveling along construction roads and access roads, or any road within critical habitat, shall not exceed 20 miles (32 km) per hour. All roads entering critical habitat would be posted with speed limits of 20 miles (32 km) per hour.

17) After construction activities are completed, operations would be directed by the 1996 BO (USFWS 1996), and/or the anticipated amendment to the 1996 BO, or new and subsequent BOs tiered to the original, including the BO that would be issued as a result of this BA, with the exception that off-road driving (which is prohibited by the 1996 BO) would be allowed.

18) All personnel operating vehicles within tortoise habitat on the CMAGR would inspect underneath their parked vehicle before moving it. If a desert tortoise is found beneath a vehicle, the Tortoise Management Representative or qualified appointee(s) would be contacted and the vehicle would not be moved until the Tortoise Management Representative removes it from harm's way or the tortoise leaves on its own accord.

19) No pets would be permitted at any time within SWATs 4 and 5. Military working dogs are permitted, but only under the control of their handler.

20) All ground personnel that enter SWATs 4 and 5 would be required to remove all food stuffs, trash, or other waste that may attract common ravens (*Corvus corax*) and other desert tortoise predators, in accordance with existing regulations for the CMAGR. Any temporary trash receptacles would be equipped with latching/locking lids. The Tortoise Management Representative would be responsible for ensuring that trash is removed regularly from the project area and that the trash containers are kept securely closed when not in use. MCAS Yuma would employ the following measures to further discourage raven settlement:

    a. Spikes (e.g., nixalite) or other deterrents would be installed on structures (e.g., sniper towers) to prevent perching by common ravens and raptors.

    b. Abandoned vehicles found on the CMAGR would be inventoried and steps would be taken to remove them.

    c. Public use is restricted and would continue to be restricted in the CMAGR, thus reducing the raven attraction towards people.

    d. Cattle grazing and cattle watering troughs are restricted on the range and would remain as such for security and raven prevention.

    e. Range signs and fencing would be limited to a minimum to reduce the number of elevated perches.

    f. Training operations and personnel would be required to properly dispose of food and trash per Station Order (StaO) 3710.63.

g. Construction activities would have appropriate trash receptacles per StaO 3710.63.

h. Construction personnel, range wardens, range inspectors, and troops using the training areas would be educated and instructed to report any raven sightings which would be investigated and documented by MCAS Yuma biologists.

i. Any raven or raven nests discovered on the CMAGR would be evaluated by MCAS Yuma biologists for tortoise predation. Additionally, when any raven-damaged tortoise shells are found, the surrounding area would be searched for raven and raven nests. Upon completion of any necessary environmental review, and in accordance with appropriate permitting, any predatory ravens and their nests would be removed using methods similar to those identified in the March 2008 "Reduce Common Raven Predation on the Desert Tortoise" USFWS EA upon completion of any necessary environmental review and in accordance with appropriate permitting.

j. Periodically, all wildlife guzzlers would be inspected by biologists, range inspectors, and range wardens for raven usage. Observations of tortoise carcasses and raven nests near guzzlers would result in further evaluation for removal.

21) The Tortoise Management Representative or appointee(s) would survey all ground support areas for dead or injured tortoises after the completion of each ground operation.

22) Should a dead or injured tortoise be located on-site during or after any military activity, the MCAS Yuma Range Management Department would be notified immediately. The USFWS would be notified by the Tortoise Management Representative via email within three working days of the discovery of any tortoise death or injury caused by military activity. Notification would include the date, time, circumstances, and location of any injury or death. Dead animals would be buried to avoid attraction of scavengers. Injured animals would be taken to a veterinarian approved by the USFWS. Information to be provided to the USFWS would include the date and time of the finding or incident (if known), location of the carcass, a photograph, cause of death (if known), and any other pertinent information.

23) In an effort to control the spread of invasive (non-native) weeds, all construction-type equipment and/or construction-type vehicles originating outside of the CMAGR shall be power-washed before entering roadways on the way to the CMAGR. While washing wheeled vehicles, the front wheels shall be turned lock-to-lock to allow for exposure of surfaces that may hold soil or weed seeds.

24) Vehicles would remain on established roads except as required for mounted LFAM training activities. To reduce potential impacts, vehicles used during LFAM training activities would stay within the confines of road boundaries until the designated range is reached.

2.9.4 Cultural Resources

1) MCAS Yuma is preparing a Programmatic Agreement (PA) to guide the continuation of Section 106 consultation. Through consultation with the State Historic Preservation Officer (SHPO) and interested Federally Recognized Tribes, MCAS Yuma would develop appropriate AMMMs for the Proposed Action.

2) Should subsurface archaeological deposits be discovered during ground disturbing activities, all work in the immediate area would cease. The unanticipated discovery would be treated according to the stipulations in the forthcoming PA.

2.9.5 Public Health and Safety

1) Before construction, areas subject to ground disturbance would be swept for UXO by EOD personnel to minimize the risk of encountering UXO during construction.
2) Additional range marking/warning signs would be posted intermittently on the northern perimeter of SWAT 5, and western perimeter of SWAT 4.
3) Final range design would be in accordance with MCO 3570.1C, *Range Safety* to achieve a 99.9999 percent level of munitions containment within the CMAGR.
4) All proposed training activities and aircraft operations would continue to be in compliance with existing Range and Training Area Standard Operating Procedures (StaO 3710.61), the Pre-mishap Plan (StaO 3750.2D), and the Restricted Areas and Military Operation Areas/Air Traffic Control Assigned Airspace (StatO 3710.6H Ch. 1).
5) Before initiating excavation within the HHIA, the construction contractor would survey the HHIA for surface-level contamination in accordance with RCRA and CERCLA.
6) MCAS Yuma would continue to comply with DoD Directive 4715.11, *Environmental and Explosives Safety Management on Operational Ranges within the United States*, and DoD Instruction 4715.14, *Operational Range Assessments* to identify whether there is a release or a substantial threat of a release of munitions constituents (MCs).
7) Any found item meeting the definition of a military munition, as found in the 40 CFR § 266 ("Military Munitions Rule"), would be properly demilitarized before transport. Munitions meeting this definition without being properly demilitarized for recycling or resale, would be considered hazardous waste and treated as such. Proper handling, packaging, storing, and shipping shall be performed as mandated by the RCRA.

2.9.6 Air Quality

1) Imperial County Air Pollution Control District Rule 800 would be followed by the construction contractor to minimize potential fugitive dust by implementing measures to reduce particulate matter emissions (e.g., watering of exposed soils, soil stockpiling, and soil stabilization) during construction. This includes the preparation of a fugitive dust control plan before construction.
2) As a maintenance item, a dust palliative would be applied as needed to the major roads to reduce fugitive dust emissions during the training phase of the Proposed Action.

2.9.7 Noise

1) To minimize the effect of low frequency explosive noise associated with use of the Explosives Range, detonations would be scheduled during daytime hours only (i.e., from 7:00 a.m. to 10:00 p.m.), to the extent practicable.

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CHAPTER 3
AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 APPROACH TO ANALYSIS

This chapter presents the affected environment and potential direct and indirect environmental consequences for the following resource areas: geology and soils, water resources, biological resources, cultural resources, public health and safety, air quality, and noise. The cumulative impacts on the aforementioned resource areas are discussed in Chapter 4. This EA does not include a detailed analysis of the resource areas discussed below in Section 3.1.1. These resource areas have been eliminated from detailed analysis because the USMC anticipates negligible or no impacts to these resource areas would occur from implementation of the alternatives, for the reasons as presented for each resource area.

3.1.1 Resources Eliminated From Detailed Analysis

3.1.1.1 Land Use

Land use refers to the various ways in which land might be used or developed (e.g., military training, parks and preserves, agriculture, commercial), the kinds of activities allowed (e.g., factories, mines rights-of-way), and the type and size of structures permitted (e.g., towers, single-family homes, multi-story office buildings). The Proposed Action would occur on lands owned by the federal government designated for military training. The Proposed Action would not change this designation and would be consistent with the Land Withdrawal Renewal Legislative EIS for the CMAGR (DoN 2013). Surrounding land uses, which include open space, natural resource exploration, recreation, utility corridors, and transportation corridors, would not be altered, and no activities considered incompatible with surrounding land uses would be introduced. Implementation of the Proposed Action would comply with all applicable federal, state, and local statutes and regulations (see Section 1.6, *Regulatory Setting*), as well as all applicable federal, state, regional, and local policies and programs.

None of the proposed SDZs associated with dud-producing ordnance would encumber (overlap) a USBR berm; however, the proposed East Complex Access Road would traverse up and over an existing USBR berm (Berm 19; refer to Figure 2-3). Written authorization from the USBR is required to cross (encroach upon) USBR lands that contain project features such as levees, canals, pipelines, or other water conveyance facilities owned or administered by the USBR. Requirements for obtaining a use authorization to cross USBR project land and water surfaces are found in 43 CFR 429 and Reclamation Manual Land Management and Development 08-01, *Land Use Authorizations*. MCAS Yuma has initiated the pre-application process with the USBR Yuma Area Office having jurisdiction over the area of interest.

As presented in Section 3.8, *Noise*, noise associated with the Proposed Action would be consistent with baseline conditions and would continue to be compatible with existing land uses. There would be no change to noise levels under the No-Action Alternative. Therefore, implementation of any one of the alternatives would result in no impact to land use.

3.1.1.2 Socioeconomics and Environmental Justice

Implementation of the Proposed Action would result in a minor, yet multi-year increase in construction-related jobs for the region, which would result in a minor, multi-year increase in sales of goods and services offered in Imperial County. Following construction, the Proposed Action would not create any new jobs and no change to the existing economic condition would occur. Under the No-Action Alternative, existing socioeconomic conditions would continue. Therefore, implementation of any one of the alternatives would result in no adverse socioeconomic impacts.

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires federal agencies to consider human health and environmental conditions in minority and low-income communities. EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks* helps ensure that federal agencies' policies, programs, activities, and standards address environmental health and safety risks to children. The project area is located on a military range restricted to the public. Children are not present and there is no permanent military family housing or civilian housing at or near the project area. Therefore, implementation of any one of the alternatives would result in no disproportionate impact to minority populations or the health and safety of children.

3.1.1.3 Transportation

The Proposed Action is located in a remote area of Riverside and Imperial counties that is characterized by a low population density and the absence of major employment centers. Accordingly, the surrounding transportation network does not experience the recurring travel demand associated with workday commuting. Instead, the street system serves regional travel between widely dispersed land uses and regional transportation facilities, such as State Route 111. Therefore, the area street system is not expected to experience substantial recurring traffic congestion.

Temporary traffic increases would occur within the project area and on the surrounding street network as equipment and materials are delivered to the construction sites, and as workers commute to and from these locations. While worker trips would occur on a daily basis, construction equipment and material deliveries would likely be grouped, delivered, and then stored at nearby staging areas for the duration of construction. Given the approximately 2 years of construction, the number of workers required on any given day is expected to be relatively minor, and is therefore not anticipated to have a substantial effect on transportation capacity. As described in Chapter 2, local (within the project area) sources for borrow (soil) material would be used, thus eliminating the need for the delivery of offsite material and with it, a potential increase in construction traffic. Concrete for construction activities would be prepared at the proposed temporary batch plant at Camp Billy Machen; while materials trips would occur to the batch plant, no loaded concrete mixer trucks are anticipated on public roadways outside the installation.

Following construction, the increased training tempo is unlikely to result in a recurring daily traffic increase on the transportation network during peak commuting hours. Instead, there would be a periodic and incremental increase in traffic before and after training events as NSW personnel arrive at and depart the CMAGR more frequently and in greater numbers. Under the No-Action Alternative, there would be no change in existing transportation conditions. Given the remote location of the Proposed Action, and considering the relatively minor and periodic increase in personnel, implementation of any one of the alternatives would result in a negligible impact to transportation.

3.1.1.4 Visual

Aesthetics, or visual resources, are the natural and manmade (cultural) features of the landscape that can be seen and that contribute to the public's enjoyment of the environment. Aesthetics are generally defined

in terms of a project's physical characteristics and potential visibility. Impacts are assessed based on the extent to which the project's presence would change the perceived visual character and quality of the environment in which a project would be located. Implementation of the Proposed Action would not dramatically alter the existing visual setting of the project area and vicinity as the setting would continue to support on-going military aviation and ground-based training and the proposed redesigned ranges would be consistent with existing range features. There would be no change to the visual environment under the No-Action Alternative. Therefore, implementation of any one of the alternatives would result in no impact to visual resources.

3.1.1.5 Recreation

Recreational areas are defined as public or private lands that provide for relaxation, rest, activity, education, or other opportunities for leisure services and community support that lead to an enhanced quality of life. Lands adjacent to the CMAGR offer recreational uses such as hiking, camping, bird watching, hunting, and rock climbing (DoN 2013). Existing recreational activities adjacent to the project area would not be impacted, as the Proposed Action would occur entirely on DoD lands. As presented in Section 3.8, *Noise*, noise associated with the Proposed Action would be below significance thresholds at the identified noise-sensitive areas. Accordingly, anticipated noise levels would be barely noticeable to recreational users and thus implementation of the Proposed Action would not significantly affect nearby recreational activities. There would be no impact to recreation under the No-Action Alternative, as existing conditions would remain as is. Therefore, implementation of any one of the alternatives would result in no significant impact to recreational resources.

3.1.1.6 Utilities

Utilities include those portions of the infrastructure (e.g., power, water, gas) needed to serve physical facilities and personnel. Under the Proposed Action, no utility infrastructure would be constructed, and no additional utility usage would occur within the RTAs. The isolated range indicator "solar beacons" would be charged via solar power; no power lines would be installed as part of the Proposed Action. Similarly, all drinking/training-related water needs within the RTAs would be met by portable water containers; no water lines would be installed as part of the Proposed Action. Existing easements or site access arrangements would be maintained or updated as necessary to provide continued access to utility companies. Under the No-Action Alternative, there would be no increase in utility demand from existing conditions. Therefore, implementation of any one of the alternatives would result in no impact to utilities.

3.1.1.7 Hazardous Materials and Waste

Hazardous materials include hazardous substances, hazardous wastes, or materials that pose a potential hazard to human health and safety or the environment based on their quantity, concentration, or physical and chemical properties. The increase in training activities under the Proposed Action would increase the risk of potential releases of fuels, lubricants, coolants, and hydraulic fluids from vehicles through leaks or spills. Any hazardous spills would be contained and properly disposed of in accordance with established local, federal, and state laws and regulations. The existing hazardous materials response plan would continue to be followed, and MCAS Yuma response team would respond immediately to any spills. Hazardous materials would continue to be transported in accordance with all U.S. Department of Transportation and Defense Transportation Regulation requirements, and be managed under MCO 4450.12 and in compliance with the Camp Billy Machen Hazardous Material Business Plan. A discussion of MCs is located in Section 3.6, *Public Health and* Safety. There would be no impact to hazardous materials and waste under the No-Action Alternative, as existing conditions would remain as is.

Therefore, implementation of any one of the alternatives would result in no significant impact to hazardous materials and waste.

3.2 GEOLOGY AND SOILS

3.2.1 Definition of Resource

Geological resources are generally defined as the topography, geology, seismicity, and soils of a given area. Topography is the elevation, slope, aspect, and surface features found within a given area. Long-term geological, seismic, erosional, and depositional processes typically influence the topographic relief of an area. The geology of an area includes bedrock materials, mineral deposits, and fossils. Seismicity is the relative frequency of earthquakes in a given area. Soil refers to unconsolidated earthen materials overlaying bedrock or other parent material. Soil structure, elasticity, strength, shrink-swell potential, liquefaction potential, and erodibility all determine the ability of the ground to support structures and facilities. The region of influence (ROI) for geology and soils includes the project area and vicinity.

3.2.2 Affected Environment

3.2.2.1 Topography

SWATs 4 and 5 are located in the Colorado Desert and Salton Sea geomorphic provinces of California which are situated in the southwestern-most portion of the Basin and Range physiographic province. The Basin and Range province is characterized by steep, subparallel, discontinuous mountain ranges that trend northwest to southeast separated by broad, gently sloping to nearly flat, deep alluvial basins. The CMAGR is characterized by the rugged Chocolate Mountains, a range that rises abruptly from broad alluvium-filled desert basins. The Chocolate Mountains stretch more than 60 miles (97 km) in a northwest to southeast direction and are east of the Salton Sea, south and west of the Chuckwalla Mountains, and southeast of the Orocopia Mountains. Elevations within SWATs 4 and 5 range from approximately 50 ft (15 m) to 3,000 ft (914 m).

3.2.2.2 Geology

The Chocolate Mountains are largely comprised of the Southern California batholith and Orocopia Schist of Mesozoic age (about 65 to 250 million years ago), overlain by thrust fragments of an older Precambrian metamorphic complex, with minor Tertiary (about 3 to 65 million years ago) volcanic and intrusive rocks. Pliocene (about 3 to 5 million years ago) and Pleistocene (about 2 to 3 million years ago) marine and non-marine sedimentary deposits and Holocene (present-day to 10,000 years ago) alluvium occur within the adjacent basins to the east and west (MCAS Yuma 2014).

3.2.2.3 Seismicity

The project area is located in one of the most seismically active areas in California and frequently experiences earthquakes due to local or regional faults. Faults near the project area are capable of producing earthquakes as large as 7.2 to 8.1 on the Richter scale (U.S. Geological Survey [USGS] 2011a). The most prominent of these faults is the San Andreas Fault, which is located along the eastern shore of the Salton Sea, west of the CMAGR.

3.2.2.4 Soils

The Natural Resources Conservation Service (NRCS) has identified four soil associations within SWATs 4 and 5 (NRCS 2013). The soil associations are shown on Figure 3.2-1 and summarized in Table 3.2-1.

Table 3.2-1. Soil Associations within the Vicinity of the Proposed Action

Soil Association	Soil Occurrence	Erosion Hazard	
		Water	Wind
Rillito-Gunsight	Old alluvial fan soils found on dissected older alluvial fans, in valleys, and on pediments	High to Extremely High	High to Very High
Tecopa-Rock Outcrop-Lithic Torriorthents	Mountain soils found on mountain slopes and areas with rock outcrop	Slight	Moderate
Myoma-Carsitas-Carrizo	Young alluvial fans and wash soils found in mountain washes, on pediments, and on alluvial fans	Slight to Moderate	Moderate to High
Rock Outcrop	Large exposures of sandstone, granite, or boulders. Located on mountains or foothills	High	High

Source: NRCS 2013.

All soil types within the ROI have moderate to extremely high erosion hazards (NRCS 2013). Soils within the project area are subject to physical disturbance as a result of regional seismicity, flash flooding, high winds, ground- and aircraft-based military training (e.g., helicopter landings, ordnance impacts). The vegetative cover and physical and biological crusts in SWATs 4 and 5 assist in stabilization of soils, reduction in wind and water erosion, and locally increases soil productivity (DoN 2013).

Soils within the CMAGR are managed according to the MCAS Yuma Integrated Natural Resource Management Plan (INRMP). The INRMP specifies measures to offset adverse impacts of training and to sustain natural resources at the installation (MCAS Yuma 2014). One way this is accomplished is by encouraging units to utilize previously disturbed areas, especially for off-road maneuvers or digging.

3.2.3 Environmental Consequences

The protection of unique geological features, minimization of soil erosion, and siting of structures away from potential geological hazards are considered when evaluating impacts of alternatives on geological resources. Generally, geological resource impacts can be avoided or minimized if proper construction techniques, erosion control measures, and structural engineering components are incorporated into project design.

3.2.3.1 Alternative 1

<u>Construction</u>

Direct adverse impacts to soils and topography would occur from grading, movement of soils from cut/fill borrow areas, contouring static ranges, recontouring borrow sites, and construction of access roads. Direct construction impacts associated with grading, including cut/fill, borrow areas, static ranges, and access roads would total approximately 115 acres (47 ha). This represents approximately one-third of one percent of the entire project area (SWATs 4 and 5). Cut and fill necessary for the construction of static ranges and access roads would be approximately 342,300 cubic yards. All material (soil) would originate and be used on-site. Following removal of borrow material and the construction of static ranges, the borrow source areas would be graded to approximate pre-disturbance topography, resulting in alterations of topographic features; however, the resulting topography would maintain existing runoff patterns.

Soil productivity would be adversely affected by removing, mixing, or burying microorganisms found in desert crusts. Soil crusts are fragile and can be easily crushed by the movement of construction vehicles across the project site. Movement of construction vehicles may also compact soils. When disturbed, highly erodible fine soil particles can be picked up and moved by winds or during flash flood events. Watering of exposed soils (as discussed in Section 2.9.6) would increase soil compaction. Compacted soils can also affect sheet flow and concentrate runoff, accelerating erosion.

New access roads can serve as primary pathways for the introduction of nonnative plant species as vehicles can transport nonnative plant seeds. This pathway in combination with runoff from roads can elevate the supply of water at the edges of roads, facilitating the establishment and productivity of invasive plants in disturbed soils along roadsides. Once invasive plants become established, they more easily spread away from roadsides and into natural areas.

Under Alternative 1, the construction and grading of the static ranges and access roads would require coverage under the General Permit for Discharges of Stormwater Associated with Construction Activity (Construction General Permit Order 2009-0009-DWQ) because grading of more than 1 acre (0.4 ha) would occur. Although some individual static ranges and access road locations may require less than 1 acre (0.4 ha) of grading, since the construction activity is part of a larger plan of development of disturbed land surface, the project would still necessitate a Construction General Permit. The Construction General Permit requires the development and implementation of a SWPPP, (which includes site-specific BMPs) to minimize erosion, sedimentation, and stormwater runoff. Refer to Section 3.4, *Biological Resources*, for a discussion on impacts from nonnative plant species. The relevant AMMMs identified in Section 2.9 would be implemented to reduce potential impacts to geological resources during construction.

While construction of static range infrastructure would occur in a seismically active region, no regularly inhabited buildings would be constructed; thus, no seismic risk would occur.

<u>Training</u>

Under Alternative 1, the proposed increase in training would result in an increase in geological impacts that currently occur during existing training activities. Static range training - including the use of hand grenades, rockets, mortars, small arms and other ordnance - would also result in disturbance to soils from ordnance impacts within their associated footprints. As a result of the above activities, there would be an increase in soil disturbance, which could accelerate erosion and offsite movement of soils; especially with soils that have high to extremely high erosion hazards. In addition, vegetative cover and physical and biological crusts would be disrupted by expansion of training activities, resulting in enhanced wind and water erosion of soils. In accordance with the MCAS Yuma INRMP (MCAS Yuma 2014), training would utilize previously disturbed areas, especially for off-road maneuvers, as practical to do so.

To reduce dust dispersion along access roads, the USMC would apply an initial application of dust palliative on all three road surface types. Post construction, the two major access roads would be regularly surfaced with the dust palliative. The dust palliative application would minimize soil disturbance from vehicle traffic and environmental conditions (e.g., high winds). Rotary-wing aircraft training would result in the temporary disturbance of loose surface debris and soil caused by downdraft and outwash from moving rotors (collectively known as rotor wash) in the vicinity of take-offs, landings, and near-surface hovering.

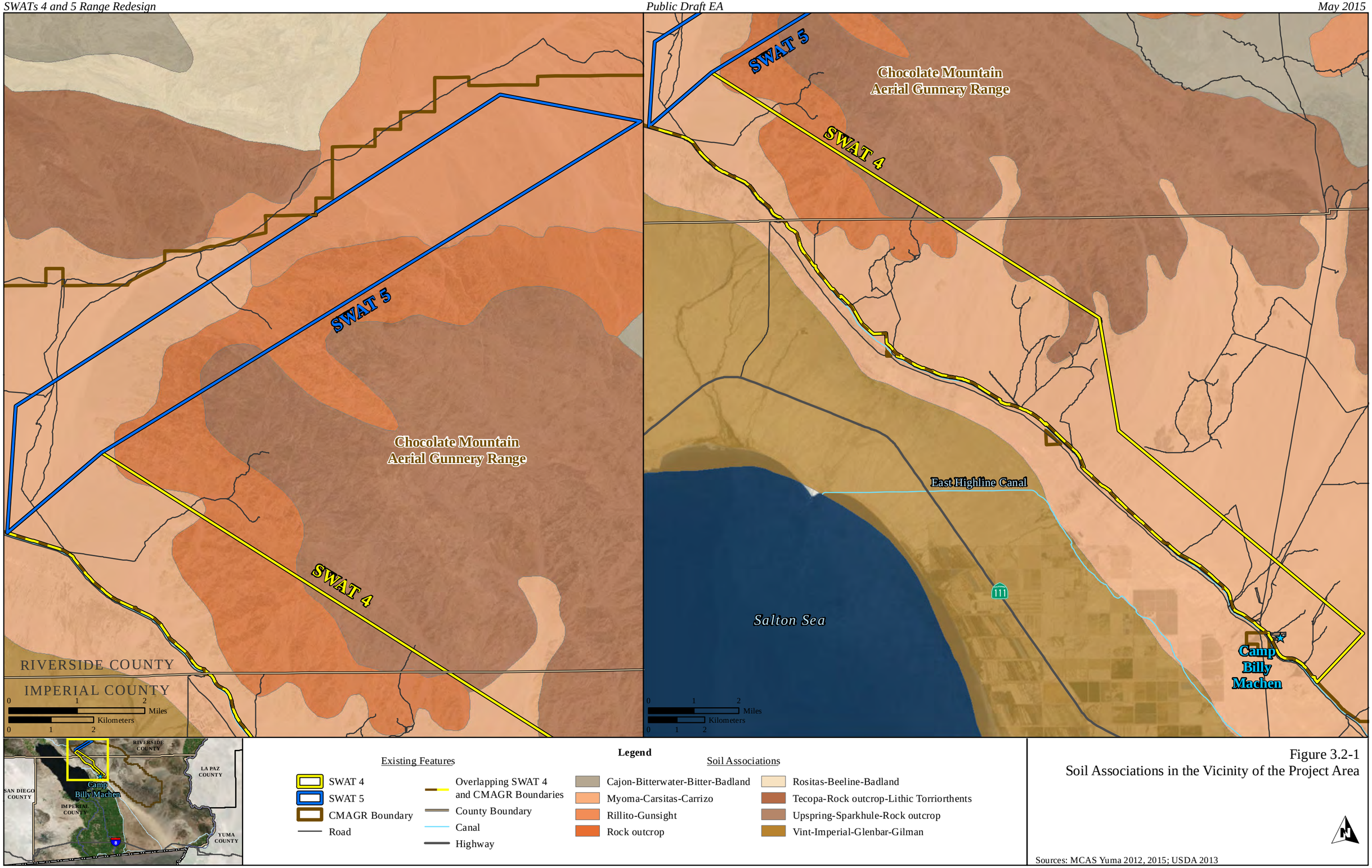

Figure 3.2-1
Soil Associations in the Vicinity of the Project Area

Sources: MCAS Yuma 2012, 2015; USDA 2013

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The landforms most susceptible to damage from vehicles are steep slopes, gravelly and sandy faces of gentle slopes, and stabilized sand dunes. No vehicle training would occur in steeper, mountainous areas with slopes greater than 30 degrees. These areas would be avoided during training activities due to unsuitable topography and potential damage to vehicles, resulting in no potential for impact to geological features in these areas.

Live-fire ranges and the use of explosives in SWATs 4 and 5 would result in increased deposition of lead, gunpowder, primer, and other MCs associated with ordnance and explosives use. Periodic mining of the impact berms would occur, thus reducing the potential for long-term accumulation of expended munitions, such as lead. The high evaporation rates and low precipitation at the range would likely limit the spread of chemical or explosives residues in soils outside the static ranges and target areas. Existing static range berms may also contain contaminated soils (e.g., lead) from historic ordnance use. If necessary, the soil would be handled and disposed of in accordance with U.S. Environmental Protection Agency (USEPA) regulations, or the soil would be considered for re-use within the range (e.g., the new impact berm for one of the new static ranges).

The relevant AMMMs identified in Section 2.9 would be implemented and maintained to reduce potential impacts to geological resources during training. Therefore, implementation of Alternative 1 would not have a significant impact to geological resources.

3.2.3.2 Alternative 2

Construction

Proposed construction impacts under Alternative 2 would be the same as presented for Alternative 1.

Training

Under Alternative 2, the increased geographic scope of mounted and dismounted LFAM, along with off-road vehicle driving and maneuvering, would result in the disturbance of soils over a larger area as compared to Alternative 1. The disturbance of soils would likely increase the overall susceptibility of soils to erosion or migration of soil offsite over a larger area, by altering soil structure, reducing vegetation stabilization, and disturbing physical and biological crusts. The relevant AMMMs identified in Section 2.9 would be implemented and maintained to reduce potential impacts to geological resources. Therefore, implementation of Alternative 2 would not have a significant impact to geological resources.

3.2.3.3 No-Action Alternative

Under the No-Action Alternative, training activities would continue to use the established RTAs. Soils within the established training areas would continue to be regularly disturbed. Foot- and vehicle-traffic on these surfaces would continue to contribute to wind and water erosion by reducing vegetative cover and breaking up the soil crust. Lead and other MCs would continue to be deposited into soils. Existing measures would continue to be implemented to minimize soil erosion. Therefore, implementation of the No-Action Alternative would not have a significant impact to geological resources.

3.3 WATER RESOURCES

3.3.1 Definition of Resource

Water resources include both surface and subsurface water, water quality, jurisdictional waters (waters of the U.S.), and floodplains. Surface water includes lakes, ponds, rivers, streams, impoundments, and

wetlands within a defined area or watershed. Subsurface water, commonly referred to as groundwater, is typically found in areas of highly porous soil called aquifers, where water can be stored between zones of geologic confinement and within soil pore spaces. Water quality describes the chemical and physical composition of water as affected by natural conditions and human activities. Floodplains are relatively flat areas adjacent to rivers, streams, watercourses, bays, or other bodies of water subject to inundations during flood events. Hydrology describes water, its properties, circulation, and distribution, on and under the surface of the earth and in the atmosphere, from the moment of precipitation until returning to the atmosphere through evapotranspiration, or is discharged into the ocean or other basin (e.g., the Salton Sea).

The ROI for water resources includes SWATs 4 and 5 and areas located directly upstream and downstream (including the Salton Sea) of the project area.

3.3.2 Regulatory Setting

The CWA of 1972 is the primary federal law that protects the physical, chemical, and biological properties of the nation's waters (waters of the U.S.), including all navigable waters, their tributaries, and jurisdictional wetlands. Section 404 of the CWA regulates the discharge of dredged or fill material into waters of the U.S. by prohibiting such discharges without a permit from the U.S. Army Corps of Engineers (USACE). Section 401 of the CWA requires any applicant for a federal license or permit that may result in a discharge of a pollutant into waters of the U.S. to obtain a certification from the state in which the discharge originates or would originate. In California, the State Water Resources Control Board and RWQCB are responsible for establishing the water quality standards (objectives) required by the CWA, and regulating discharges to ensure dischargers meet water quality objectives.

3.3.3 Affected Environment

3.3.3.1 Surface Water

The project area is located within the Salton Sea watershed. The Coachella Canal runs adjacent to and south/southwest of the project area. Annual precipitation in Imperial County is low (approximately 3 inches [8 centimeters] per year), while the annual evaporation rate is high at approximately 100 inches (254 centimeters) (County of Imperial 2013). Consequently, only a few permanent surface water resources (e.g., Salton Sea, Coachella Canal) occur in the vicinity of the project area.

Occasional high-intensity storm events combined with low soil infiltration rates can result in overland flows and runoff into ephemeral drainages. The majority of the interior drainage within the ROI flows through ephemeral streams and unnamed washes (Figure 3.3-1). The ephemeral drainage and washes within the project area are almost always dry, but may experience short-term intense flow (e.g., flash flood) during and immediately following rainstorms (Figure 3.3-2). The combination of low precipitation and high evaporation results in surface water rarely, if ever, reaching off-range receiving waters (e.g., the Salton Sea).

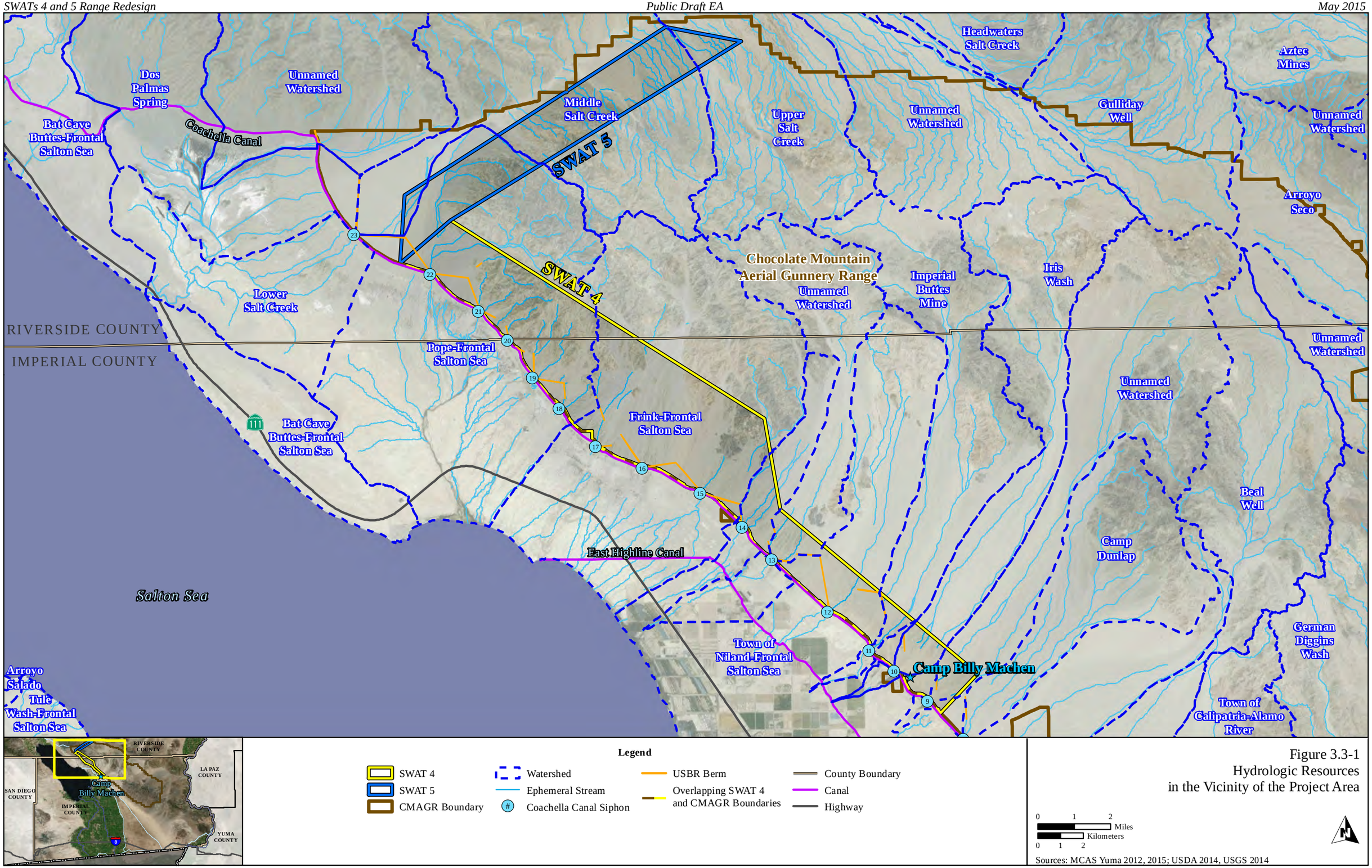

Figure 3.3-1
Hydrologic Resources
in the Vicinity of the Project Area

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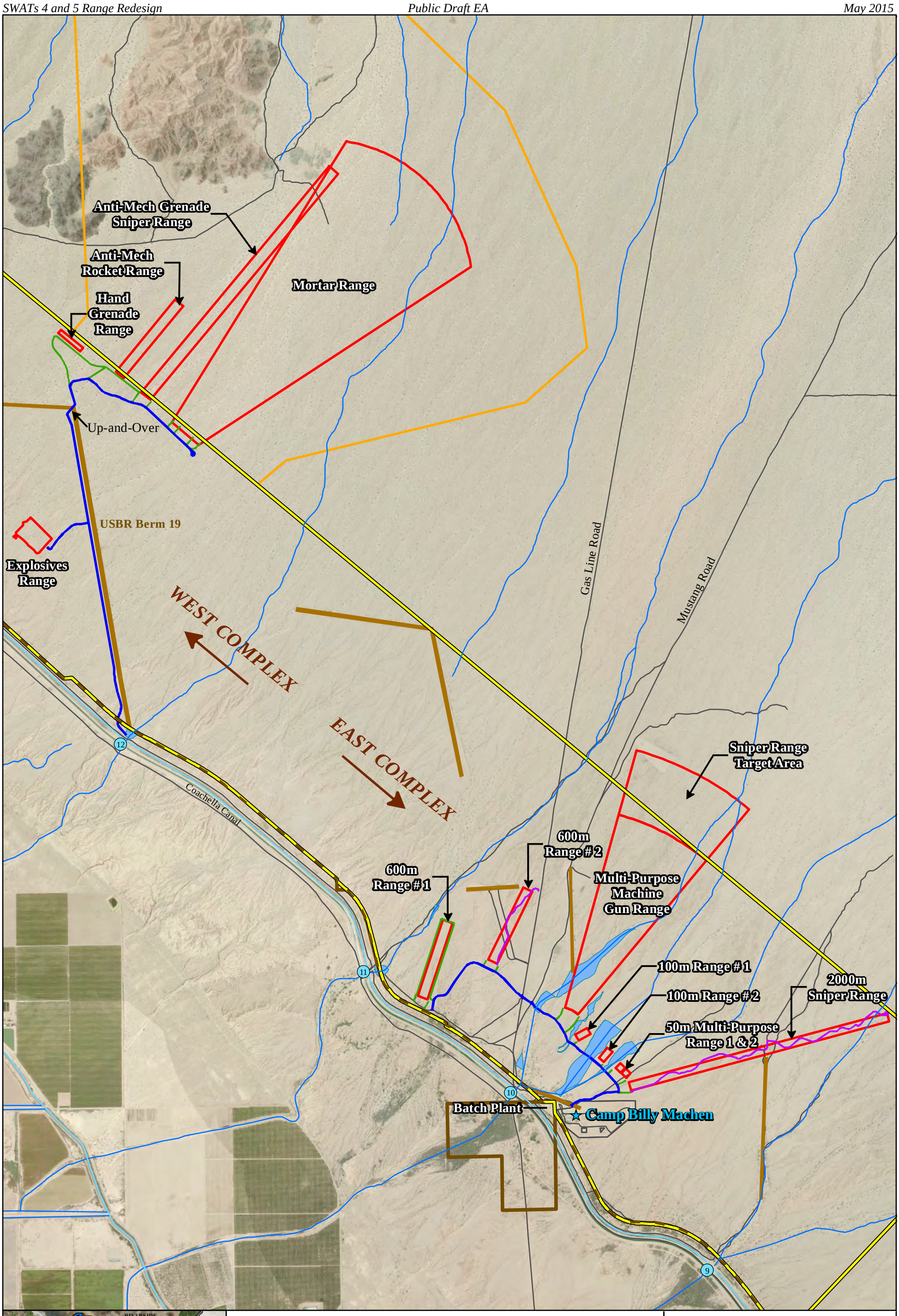

Legend

Existing Features
- SWAT 4
- CMAGR Boundary
- Siphon
- Ephemeral Drainage
- Ephemeral Wash
- Overlapping SWAT 4 and CMAGR Boundaries
- USBR Berm
- Existing Road
- Canal

Proposed Features
- Maintenance Road
- Major Road
- Minor Road
- Static Range
- High Hazard Impact Area

Figure 3.3-2
Ephemeral Drainages in the Vicinity of the Proposed Static Ranges

0 1,000 2,000 Feet
0 250 500 Meters

Source: MCAS Yuma 2012, 2015

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Areas currently exposed to moderate or complete military surface use are estimated to be about 5 percent of the total CMAGR. There are numerous manmade alterations and obstructions to the hydrologic regime in the project area, notably the multiple berms managed by the USBR that direct flow towards large siphons that flow over the Coachella Canal, along the southwest boundary of SWAT 4. Multiple channels are funneled towards these siphons, creating large compound channels (washes) that lead out of SWAT 4 and towards the Salton Sea (see Figure 3.3-1). Down-gradient of the project area, the channels cut through an area of high agricultural activity. Within this area, there are two sets of channels/canals; one for irrigation and one for runoff. Within this complex of channels, the connectivity of the runoff channels to the Salton Sea is not entirely clear. However, manmade barriers and/or disturbances do not change or negate potential USACE jurisdiction.

The Salton Sea is a terminal water body that contains approximately 230,000 acres (93,078 ha) of surface water. Water flows into the Salton Sea from the Alamo (approximately 46 percent of total inflow), New (33 percent), and Whitewater (5.6 percent) rivers; from direct discharge from irrigation drains (10 percent); and from direct precipitation and ephemeral washes draining the nearby mountains (approximately 5 percent) (Cohen et al. 1999, Colorado River Basin RWQCB 2014, USACE 2013). Approximately 75 percent of the freshwater inflow to the Salton Sea is agricultural drain water from Imperial Valley (Colorado River Basin RWQCB 2014). The four primary USGS hydrologic unit code-8 watersheds that surround the Salton Sea and that would potentially provide overland inflow to the Salton Sea are Carrizo Creek Watershed (418,212 acres [169,244 ha]), Salton Sea Watershed (3,205,496 acres [1,297,218 ha]), San Felipe Creek Watershed (675,680 acres [273,438 ha]), and Whitewater River Watershed (960,328 acres [388,631 ha]) (Figure 3.3-3).

As shown on Figure 3.3-3, the project area encompasses approximately 0.6 percent of the land cover of the watersheds that potentially contribute overland water flow to the Salton Sea (31,888 acres [12,905 ha] of 5,259,716 acres [2,128,532 ha]).

3.3.3.2 Waters of the U.S.

Under Section 404 of the CWA, the USACE has jurisdiction over waters of the U.S. and has the authority to issue permits for the discharge of dredged or fill material into waters of the U.S. A jurisdictional delineation survey was completed in support of this EA. All areas with the potential to be impacted by construction activities under the Proposed Action were investigated and surveyed for potential jurisdictional features in December 2013 and January 2014. There are no potential wetlands located within the project area.

The jurisdictional delineation identified ephemeral channels (drainages) and washes with sandy to gravelly bottoms that convey water only during and immediately after rain events. Given the high infiltration rate of sandy soils (U.S. Department of Agriculture [USDA] 2013), the low annual precipitation (approximately 3 inches [8 centimeters] per year) and high annual evaporation rate (approximately 100 inches [254 centimeters]) in Imperial County (County of Imperial 2013), the distance of the project area from the Salton Sea (approximately 6 miles [10 km]), and the relatively minimal theoretical contribution of overland water flow from the project area (refer to Section 3.3.3.1), it is unlikely that the ephemeral channels that occur in the project area contribute a significant amount of surface drainage to the Salton Sea.

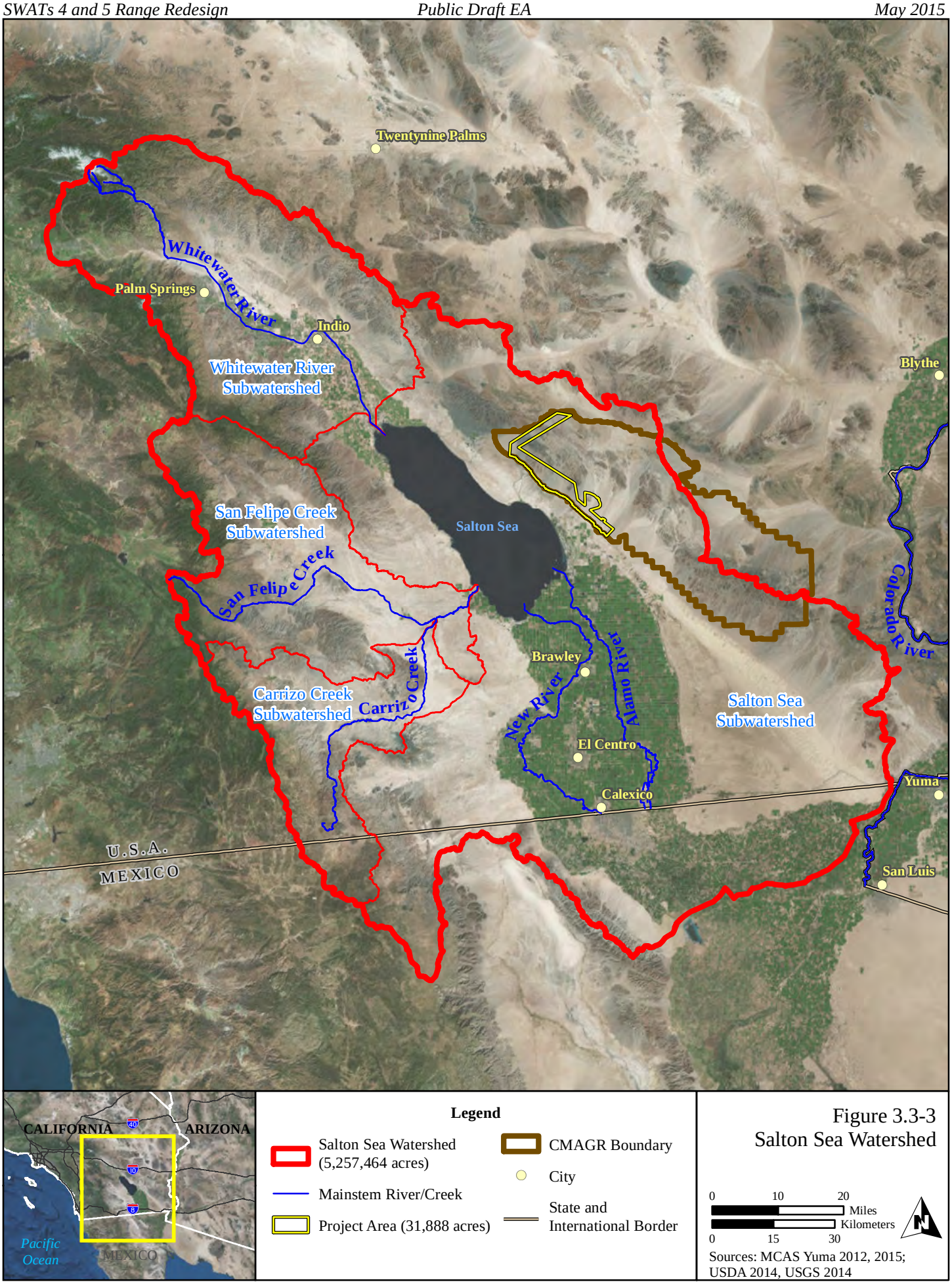


Figure 3.3-3
Salton Sea Watershed

3.3.3.3 Groundwater

Due to the absence of perennial and intermittent surface water flows in the vicinity of the project area (and generally in desert areas), groundwater infiltration is minimal; ephemeral surface waters typically do not infiltrate to groundwater table depths. Groundwater depths in the project area range from 20 to 48 ft (6 to 14 m) in depth. The groundwater underlying the CMAGR is generally considered unusable for domestic and irrigation uses. Within the irrigated portion of Imperial Valley, groundwater is shallow, often interfering with agricultural practices due to saturation and elevated concentration of dissolved salts (California Department of Water Resources 2004).

3.3.3.4 Hydrology

The project area is located in the Colorado Desert region of southern California, which is characterized by hot, dry weather, sparse natural vegetation, and episodic precipitation patterns. Flooding in Imperial County primarily occurs during either large winter storms or summer monsoon season. Floods caused by winter storms are typically characterized by extended periods (1-3 days) of moderate to heavy rainfall, while storms during the monsoon season are typically thunderstorms with intense, short duration downpours. The Federal Emergency Management Agency has not mapped any Special Flood Hazard Areas within the project area.

3.3.3.5 Water Quality

The Salton Sea is on the CWA 303(d) list of impaired water bodies for nutrients, salinity, and selenium. Agricultural runoff, which contains dissolved salts, nutrients (i.e., fertilizers) and pesticides in turn, contributes to poor surface water and groundwater quality within Imperial Valley (California Department of Water Resources 2004).

In 2008, the USMC performed a Range Environmental Vulnerability Assessment (REVA) to identify whether there is a release or substantial threat of a release of MC from the operational range or range complex areas to off-range areas. Fate and transport analysis of potential MC migration via surface water was conducted as part of the vulnerability assessment. The REVA trigger value is any concentration that is above the average analytical detection limit for MCs of interest. The REVA trigger values are not associated with any regulatory or other screening values (USMC 2008b).

The screening level analysis concluded that average annual concentrations of all indicator MC in runoff would exceed the REVA trigger value at Siphon 10 (see Figure 3.2-2), which represents a potential pathway for MC migration from the CMAGR. However, no potential risk to human health has been identified, as toxicity thresholds for humans and other biological receptors are several orders of magnitude above the estimated MC concentrations reaching the range boundary (USMC 2008b). The USMC REVA program continues to monitor potential MC migration.

3.3.4 Environmental Consequences

This section evaluates the potential impacts to water resources from implementation of the alternatives. Significant impacts to water resources could potentially occur if the implementation of an alternative resulted in changes to water quality or supply, threatened or damaged unique hydrologic characteristics, endangered public health by creating or worsening health hazards, resulted in an increased flood potential, or violated laws or regulations.

3.3.4.1 Alternative 1

Iterative Impact-Reducing Design Process

The range redesign team initially developed a project design that would have resulted in impacts to waters approximately three times greater than the currently presented potential impacts. However, once the initial results of the jurisdictional delineation were made available, the design team was able to make adjustments to the range, road, and cut/fill designs that would minimize impacts to existing ephemeral channels, without sacrificing operational training needs. This resulted in substantial reduction of impacts to ephemeral drainages. The resulting impact discussion reflects avoidance of impacts to ephemeral drainages to the greatest extent possible.

Construction

No permanent surface water features are located in the project area; thus, no impacts to surface water features within the project area would occur. The placement of fill material and road and range protection features (e.g., riprap) would result in alterations to existing ephemeral drainages. The proposed features would potentially directly impact up to 6,264 linear ft (1,909 m) of ephemeral drainages, including up to 0.41 acre (0.17 ha) of ephemeral washes. The proposed features would not change the hydrologic function of the ephemeral drainages or washes, as the flow of stormwater would not be obstructed or restricted. To the extent practicable, the design would minimize permanent impacts to ephemeral drainages within the project area.

Under Alternative 1, construction activities would require coverage under the General Permit for Discharges of Stormwater Associated with Construction Activity (Construction General Permit Order 2009-0009-DWQ) because grading of more than 1 acre (0.4 ha) would occur. Although individual static ranges and access road locations may require less than 1 acre (0.4 ha) of grading, since the construction activity is part of a larger plan of development of disturbed land surface, the project would still necessitate the Construction General Permit. The Construction General Permit requires the development and implementation of a SWPPP, which includes site-specific BMPs to minimize water quality impacts from construction-related stormwater runoff. Operation of the temporary batch plant facility would require a General Industrial Permit (97-03 DWQ). Similar to the Construction General Permit, site- and industry-specific BMPs would be implemented to minimize water quality impacts as part of the SWPPP.

As part of a Grading Plan, an Erosion Control Plan would be prepared to include standard erosion control measures (e.g., silt fencing) to reduce potential impacts (e.g., soil loss and sedimentation) to water quality during construction. Alternative 1 would be implemented in full compliance with the requirements of the CWA. Construction would not excavate areas deeper than 15 ft (4.5 m); therefore, groundwater would not be directly affected.

During construction, the major and minor access roads would be treated with a dust palliative. The dust palliative currently identified ("Gorilla-Snot", made by Soilworks) is an eco-safe, biodegradable, liquid copolymer used to provide erosion control and dust suppression. A modest application creates a light surface crust that remains water permeable for air and water. The product is designed to penetrate into the ground, creating a strong and resilient, yet flexible, surface that can withstand vehicle traffic and environmental conditions. The dust palliative does not migrate from treated areas and does not seep into the groundwater. It does not wash away in the rain and does not re-emulsify with water (Soilworks 2015a).

Training

Under Alternative 1, potential surface water impacts from training would include soil compaction that could lead to altered drainage patterns; increased runoff, erosion, and sedimentation. Vehicles operating during rain events would increase turbidity and sediment loading in ephemeral drainages. Given the dispersed and low-impact nature of training, the low probability for substantial runoff-generating stormwater events, and the distance to the nearest permanent surface water features, training-related impacts to surface water features located out of the project area would be negligible. Training activities would not directly affect permanent surface water features and would not alter the course of stormwater runoff. Following construction, the major access roads would be periodically treated with a dust palliative; no impacts to water resources would occur from the application of the dust palliative.

Periodic clean-up of the impact berms would occur, thus reducing the potential for long-term accumulation of MCs. Furthermore, soil conditions, low average rainfall, and depth to groundwater are not conducive to contributing to the leaching of lead into soil or groundwater. Given the low precipitation and high evaporation rates in the area, stormwater flows originating within the CMAGR rarely reach off-range receiving waters (i.e., the Salton Sea). The toxicity thresholds for humans and other biological receptors are several orders of magnitude above the estimated MC concentrations reaching the range boundary (USMC 2008b); no impact to water quality is anticipated. Therefore, implementation of Alternative 1 would not contribute to the Salton Sea's 303(d) impairment or negatively affect beneficial uses.

Measures to reduce the sources of contamination, including range clearance of ordnance fragments and containment of spilled or leaked fuels, lubricants, coolants, and hydraulic fluids from vehicles would minimize the potential for impacting water resources. The relevant AMMMs identified in Section 2.9 would be implemented and maintained to reduce potential impacts to water resources. Therefore, implementation of Alternative 1 would not have a significant impact to water resources.

3.3.4.2 Alternative 2

Construction

Proposed construction impacts under Alternative 2 would be the same as presented for Alternative 1.

Training

Under Alternative 2, training impacts would be generally as described for Alternative 1. The increased geographic scope of mounted LFAM and off-road vehicle driving and maneuvering, throughout SWAT 4 and portions of SWAT 5 would result in the disturbance of soils over a larger area, thus resulting in a greater impact to ephemeral drainages as more drainages would be subject to vehicle activity. In addition, an increased area of soil compaction and associated increase in stormwater flows would occur under Alternative 2, as off-road vehicle driving would occur over a larger area. However, given the dispersed and low-impact nature of training, the low probability for substantial runoff-generating stormwater events, and the distance to the nearest permanent surface water features, training-related impacts to surface water features located out of the project area would be negligible. The relevant AMMMs identified in Section 2.9 would be implemented and maintained to reduce potential impacts to water resources. Therefore, implementation of Alternative 2 would not have a significant impact to water resources.

3.3.4.3 No-Action Alternative

Under the No-Action Alternative, training activities would continue to use established RTAs. There would be no fill of ephemeral drainages. Training activities within or passing through ephemeral drainages would continue to result in localized impacts to water resources, resulting in erosion and sedimentation. No impact to the quantity or quality of offsite permanent surface water features. Therefore, implementation of the No-Action Alternative would not have a significant impact to water resources.

3.4 BIOLOGICAL RESOURCES

3.4.1 Definition of Resource

Biological resources include plant and animal species and the habitats within which they occur. This analysis focuses on species that are important to the function of ecosystems, are of special societal importance, or are protected under federal or state law. These resources are commonly divided into the following categories: *Plant Communities*, *Wildlife*, and *Special Status Species*.

Biological resources are grouped and analyzed in this EA as follows:

- *Plant Communities* include plant associations and dominant constituent species that occur in the project area. Special status plant species are discussed in more detail below.
- *Wildlife* includes the characteristic animal species that occur in the project area. Special consideration is given to bird species protected under the MBTA and EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*. Special status wildlife species are discussed in more detail below.
- *Special Status Species* are defined in this EA as species that are listed, have been proposed for listing, or are candidates for listing by the USFWS or state agencies. The federal ESA protects federally listed threatened and endangered species and their associated designated critical habitat. The California ESA uses a classification system similar to the federal ESA, except that species may also be listed by the California Department of Fish and Wildlife (CDFW) as rare.

The ROI for biological resources consists of SWATs 4 and 5 and the HHIA, as depicted on Figures 2-2 and 2-3.

3.4.2 Regulatory Setting

3.4.2.1 Federal Statutes and Executive Orders

<u>Bald and Golden Eagle Protection Act (16 USC § 668)</u>

This act protects bald and golden eagles from being pursued, hunted, collected, molested, or otherwise disturbed.

<u>Migratory Bird Treaty Act of 1972 (16 USC §§ 703-719) and EO 13186</u>

This act protects all migratory birds, with the exception of the English sparrow (*Passer domesticus*), rock dove (*Columbia livia*), and European starling (*Sturnus vulgaris*). The MBTA affirms and implements the U.S.' commitment to international conventions for the protection of shared migratory bird resources. EO 13186 directs federal agencies to avoid or minimize the negative impact of their actions on migratory

birds, and to take active steps to protect birds and their habitats. All military training activities at the CMAGR are conducted in accordance with, and support of, the MBTA and EO 13186.

EO 13112, Invasive Species

This EO calls on federal agencies to work towards preventing and controlling the introduction and spread of invasive species. Non-native flora and fauna can cause substantial change to ecosystems, upset the ecological balance, and have the potential to cause economic harm.

ESA of 1973, as amended (16 USC §§ 1531-1544)

The ESA requires federal agencies to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species. The law also prohibits any action that causes unauthorized "take" of any listed species of endangered fish or wildlife. Under section 7 of the ESA, federal lead agencies are required to consult with the USFWS on any Proposed Action that may affect a listed species or its critical habitat. For projects with the potential to affect listed species, the lead agency prepares a BA of the effects of the action and submits the BA to the USFWS. If the USFWS finds that the action is not likely to adversely affect the species in question and the responsible agency concurs in writing, consultation is concluded, nominally within 30 days. If the action is likely to adversely affect the species in question, formal section 7 consultation ensues, leading to a BO, nominally within 135 days. In the BO, the USFWS sets forth non-discretionary (required) Reasonable and Prudent Measures and Terms and Conditions to minimize and/or compensate for take, as well as discretionary (recommended) conservation measures.

3.4.2.2 California Statutes

California ESA (Fish and Game Code 2050, *et seq*.)

The California ESA generally parallels the main provisions of the federal ESA and is administered by the CDFW. Federal actions on federal lands are not subject to regulation under the California ESA. Many species are listed under both the federal and state ESA, and in such cases, the federal ESA takes precedence.

3.4.3 Affected Environment

3.4.3.1 Plant Communities

Plant communities in the project area are typical of California's Colorado Desert, which is part of the larger Sonoran Desert that extends across southwest North America. The Colorado Desert region extends from the Mexican border in the south to the higher-elevation Mojave Desert in the north and from the Colorado River in the east to the Peninsular Ranges in the west (California Natural Resources Agency 2013).

The first effort to map vegetation within the CMAGR is currently underway. Since the results of this effort would not be available for several years, the best data currently available are from Gap Analysis Program (GAP) land cover data (USGS 2011b), which covers the entire United States. The GAP vegetation map is derived from remotely sensed data and field observations, with the latter being mostly absent from the CMAGR due to access restrictions. The GAP maps vegetation at the ecosystem, or plant community, level and defines mapping units based on location, landform, dominant plant physiogamy, life form (e.g., shrub or tree), and the most common suites of species (MCAS Yuma 2013).

The 10 GAP plant communities and habitats in the project area are described below and are shown on Figure 3.4-1. Acreages of all plant communities and habitats in the project area are provided in Table 3.4-1. However, it is important to note that while desert wash does occur within the project area and is vitally important to wildlife and ecological processes, the area mapped as desert wash is vastly overstated since the GAP program misidentified alluvial fans, or bajadas, as desert wash. Similarly, the GAP analysis misidentified many areas of desert pavement as desert bedrock cliff and outcrop (MCAS Yuma 2013). For a more detailed discussion of the shortcoming associated with the GAP in the project area, please refer to Section 3.3.1, *Vegetation*, of the Draft Chocolate Mountains Aerial Gunnery Range Integrated Natural Resource Management Plan (MCAS Yuma 2013).

Desert Active and Stabilized Dune is composed of unvegetated to sparsely vegetated dunes and sand sheets. Common plants include white bursage (*Ambrosia dumosa*), fourwing saltbush (*Atriplex canescens*), creosote bush (*Larrea tridentata*), and big galleta (*Hilaria rigida*).

Desert Bedrock Cliff and Outcrop includes barren and sparsely vegetated landscapes (generally <10 percent plant cover) of steep cliff faces, narrow canyons, and smaller rock outcrops of various igneous, sedimentary, and metamorphic bedrock types.

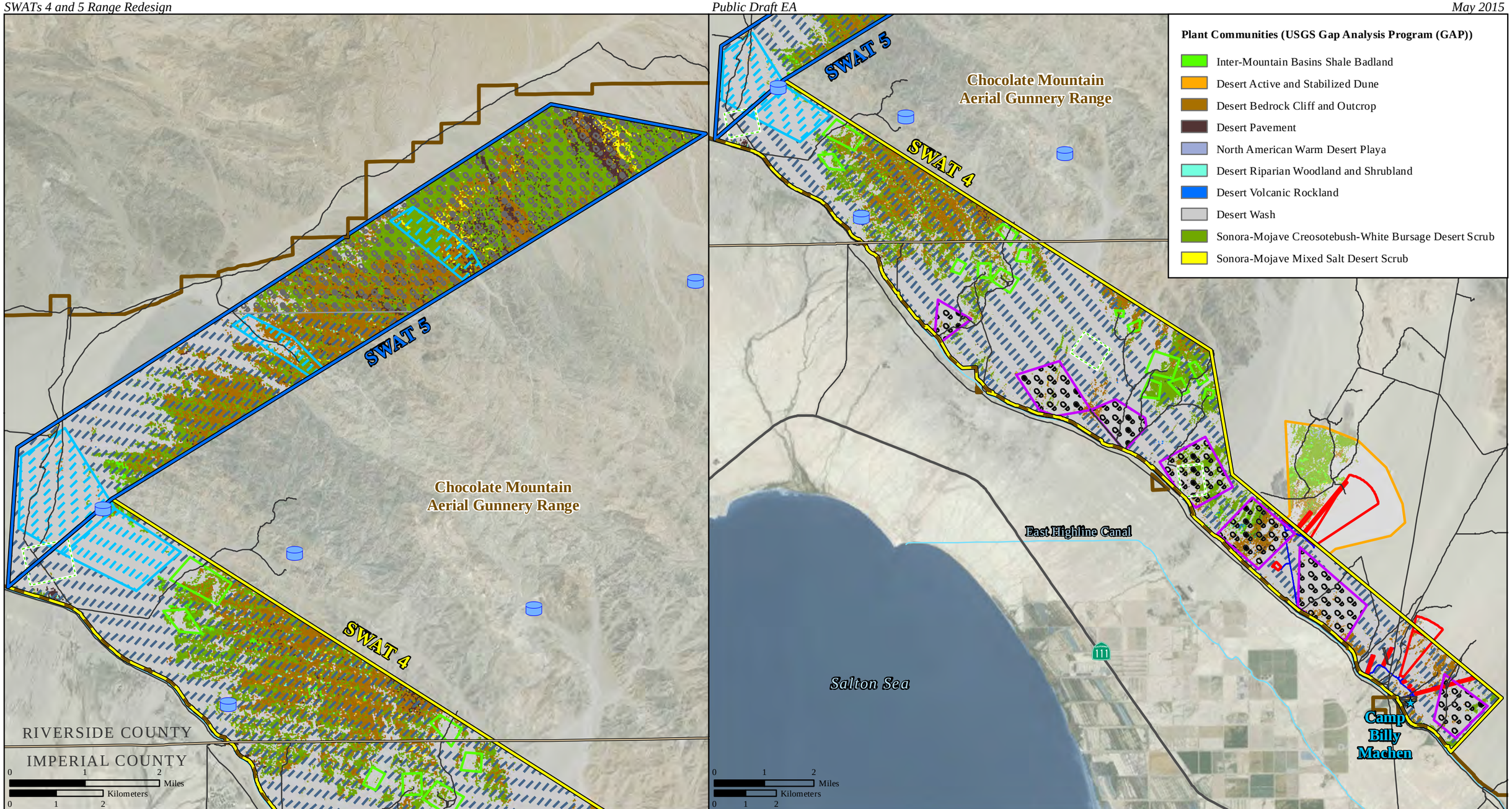
Desert Pavement is composed of unvegetated to very sparsely vegetated (<2 percent plant cover) landscapes, typically flat basins where extreme temperature and wind develop ground surfaces of fine to medium gravel. Very low cover of desert scrub species such as creosote bush is usually present.

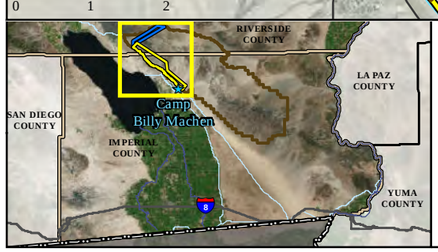
Desert Playa is a term for depressions that are intermittently flooded and subsequently evaporate, leaving behind a residue of salts. There is often an impermeable subsoil layer that keeps water near the soil surface. Bare ground and salt crusts are abundant on the soil surface. Typical plants include iodine bush (*Allenrolfea occidentalis*), bush seepweed (*Suaeda nigra*), or saltbush (*Atriplex* spp.).

Desert Riparian Woodland and Shrubland occurs along lower elevation rivers and streams in desert valleys and canyons. Common trees include Fremont's cottonwood (*Populus fremontii* ssp. *fremontii*) and black willow (*Salix gooddingii*). Common species in riparian shrublands include sandbar willow (*Salix exigua*) and desert willow (*Chilopsis linearis*). These phreatophytes (deep-rooted plants) obtain water from deep in the ground. There are no permanent surface waters or wetlands in the project area.

Desert Volcanic Rockland is restricted to barren and sparsely vegetated (<10 percent plant cover) volcanic substrates such as basalt lava (malpais) and tuff. Vegetation is variable and includes a variety of species depending on local environmental conditions. Typically, scattered creosote bush, desert-holly (*Atriplex hymenelytra*), or other desert shrubs are present.

Desert Wash habitats are intermittently flooded washes or arroyos that often dissect alluvial fans, mesas, plains, and basin floors. Although often dry, ephemeral stream processes, such as rapid sheet and gully flow, define this habitat. Desert wash plants may be sparse and patchy to moderately dense, typically occurring along the banks, but occasionally within the channel. Plants are quite variable but are mostly shrubs and small trees such as catclaw (*Senegalia greggii*), desert willow, desert almond (*Prunus fasciculata*), and mesquite (*Prosopis glandulosa* var. *torreyana*).





Legend

Existing Features

- SWAT 4
- SWAT 5
- CMAGR Boundary
- Wildlife Guzzler
- Road
- Overlapping SWAT 4 and CMAGR Boundaries
- County Boundary
- Canal
- Highway
- Parachute Drop Zone

Proposed Features (Alt. 2)

- Static Range
- High Hazard Impact Area
- Access Road
- Designated LFAM Dismounted Range
- Target Area
- Designated LFAM Mounted and Dismounted Range
- General LFAM Dismounted Area
- General LFAM Mounted and Dismounted Area

Figure 3.4-1
Plant Communities and Habitats in the Project Area

Sources: BLM 2009; USGS 2011b; MCAS Yuma 2012, 2015

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Inter-Mountain Basins Shale Badland habitat consists of rounded hills that are formed in shale bedrock, often high in clay that expand with moisture and contract with drying, also known as shrink/swell clay. It also includes shale slopes with sandstone outcrops. Vegetation is very sparse if present. Badlands are subject to erosion and gullying.

Table 3.4-1. Plant Communities and Habitats in the Project Area

Plant Community/Habitat	Area			Total
	SWAT 4	***SWAT 5***	***Proposed HHIA***	
Desert Active and Stabilized Dune	7 acres (3 ha)	2 acres (1 ha)	0	**9 acres (4 ha)**
Desert Bedrock Cliff and Outcrop	2,666 acres (1,079 ha)	2,209 acres (894 ha)	131 acres (53 ha)	**5,006 acres (2,026 ha)**
Desert Pavement	121 acres (49 ha)	473 acres (191 ha)	11 acres (4 ha)	**604 acres (244 ha)**
Desert Playa	4 acres (2 ha)	1 acre (<1 ha)	22 acres (9 ha)	**27 acres (12 ha)**
Desert Riparian Woodland and Shrubland	17 acres (7 ha)	8 acres (3 ha)	0	**25 acres (10 ha)**
Desert Volcanic Rockland	39 acres (16 ha)	0	0	**39 acres (16 ha)**
Desert Wash	17,305 acres (7,003 ha)	2,610 acres (1,056 ha)	2,058 acres (833 ha)	**21,973 acres (8,892 ha)**
Inter-Mountain Basins Shale Badland	79 acres (32 ha)	17 acres (7 ha)	42 acres (17 ha)	**138 acres (56 ha)**
Sonora-Mojave Creosote Bush-White Bursage Desert Scrub	3,183 acres (1,288 ha)	3,003 acres (1,215 ha)	615 acres (249 ha)	**6,801 acres (2,752 ha)**
Sonora-Mojave Mixed Salt Desert Scrub	23 acres (9 ha)	121 acres (49 ha)	3 acres (1 ha)	**147 acres (59 ha)**
Total	**23,444 acres (9,488 ha)**	**8,444 acres (3,417 ha)**	**2,882 acres (1,166 ha)**	**34,770 acres (14,070 ha)**

Sonora-Mojave Creosote Bush-White Bursage Desert Scrub is a widespread habitat that occurs in broad valleys, lower bajadas, plains, and low hills in the Mojave and lower Sonoran deserts. This sparse to moderately dense shrubland is dominated by creosote bush and white bursage, but many different species may be present. Other common plants include desert-holly, brittlebush (*Encelia farinosa*), ephedra (*Ephedra* spp.), and ocotillo (*Fouquieria splendens* ssp. *splendens*).

Sonora-Mojave Mixed Salt Desert Scrub forms extensive open-canopied shrublands in salty soil basins in the Mojave and Sonoran deserts. This habitat is often found around playas (dry lakes) that occasionally fill following rain. Soils are generally fine-textured clays. Common shrubs are fourwing saltbush, allscale (*Atriplex polycarpa*), or other saltbushes. Iodine bush, bush seepweed, saltgrass (*Distichlis spicata*), and other halophytic (salt tolerant) plants are often present.

3.4.3.2 Wildlife

Wildlife within the project area is typical of that found throughout much of the Sonoran Desert region of southeast California. Sonoran Desert species are adapted to survive under harsh environmental conditions, predominantly low, seasonal rainfall and highly variable temperatures. Most species have developed physiological adaptations and behaviors that allow them to survive on limited amounts of water.

The CMAGR largely lacks surface waters for wildlife with the exception of ephemeral pools that develop after storm events. The CDFW manages 26 wildlife guzzlers within the CMAGR, principally to provide supplemental water for desert bighorn sheep (*Ovis canadensis nelsoni*) and desert mule deer (*Odocoileus hemionus eremicus*) in the Chocolate Mountains (Bureau of land Management [BLM] 2009; MCAS Yuma 2014). Two wildlife guzzlers occur in the project area (see Figure 3.4-1). Based on estimated munitions constituent concentrations, existing contamination is several orders of magnitude below toxicity thresholds for biological receptors, including the wildlife guzzlers (USMC 2008b).

Reptile species that are known to occur in the project area include Sonoran gopher snake (*Pituophis catenifer affinis*), western diamondback (*Crotalus atrox*), Colorado Desert sidewinder (*Crotalus cerastes laterorepens*), red coachwhip (*Masticophis flagellum piceus*), Great Basin whiptail (*Cnemidophorus tigris tigris*), northern desert iguana (*Dipsosaurus dorsalis dorsalis*), common side-blotched lizard (*Uta stansburiana*), and common chuckwalla (*Sauromalus ater*) (California Herps 2014; NAVFAC SW 2013a).

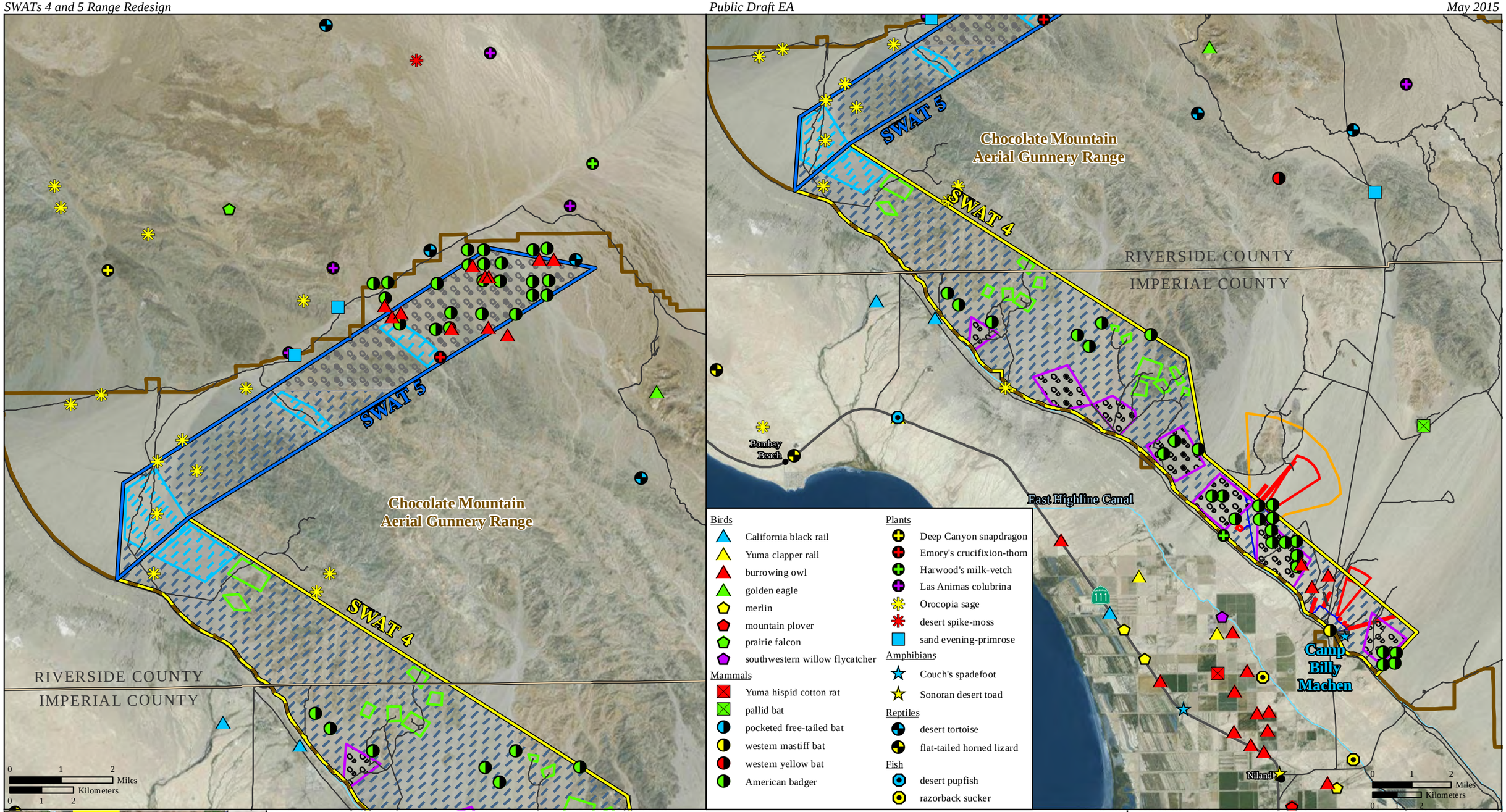
The project area is approximately 6 miles (10 km) east of the Salton Sea. The Salton Sea is home to a great diversity of bird species and a stopover for many other migratory bird species. Although migratory bird species transit through the project area, bird species are not likely to use the project area as a long-term stopover during migration because of the lack of permanent water sources and forested areas. Resident bird species known to occur in and utilize the project area include lesser nighthawk (*Chordeiles acutipennis*), verdin (*Auriparus flaviceps*), mourning dove (*Zenaida macroura*), Gambel's quail (*Callipepla gambelii)*, ladder-backed woodpecker (*Picoides scalaris*), turkey vulture (*Cathartes aura*), red-tailed hawk (*Buteo jamaicensis*), and loggerhead shrike (*Lanius ludovicianus*) (NAVFAC SW 2013a; USMC 2012).

Common desert mammals that are known to occur in the project area include black-tailed jackrabbit (*Lepus californicus*), round-tailed ground squirrel (*Spermophilus tereticaudus*), white-tailed antelope squirrel (*Ammospermophilus leucurus*), kangaroo rats (*Dipodomys* spp.), and desert wood rat (*Neotoma lepida*) (NAVFAC SW 2013a; USMC 2012). Desert mule deer, coyote (*Canis latrans*), bobcat (*Lynx rufus*), and mountain lion (*Puma concolor*) are also known to occur in and/or transit the project area; however, these larger mammals are most likely to reside in areas with high amounts of shelter/cover, water, and vegetation. The desert bighorn sheep occurs in the CMAGR in open, rocky, and steep habitats. Multiple bat species, including the pallid bat (*Antrozous pallidus*), western mastiff bat (*Eumops perotis californicus*), and pocketed free-tailed bat (*Nyctinomops femorosaccus*) are likely to occur and forage throughout the project area.

3.4.3.3 Special Status Species

A California Natural Diversity Database (CNDDB) (2013) query of known occurrences of special status species in the vicinity of the project area was conducted for this analysis (Figure 3.4-2 and Table 3.4-2).

The CNDDB inventories all federally and state listed plants and animals, all species that are candidates for listing, all species of special concern, and those species that are considered "sensitive" by government agencies and the conservation community. The California Native Plant Society (CNPS) maintains an inventory of rare and threatened plants in the state and categorizes plant species based on rarity and vulnerability using a California Rare Plant Ranks (CRPR) system. CNPS special status plant species and definitions of CRPRs are provided in Table 3.4-2.



Legend

Existing Features
- SWAT 4
- SWAT 5
- CMAGR Boundary
- Road
- Overlapping SWAT 4 and CMAGR Boundaries
- County Boundary
- Canal
- Highway

Proposed Features (Alt. 2)
- Static Range
- High Hazard Impact Area
- Access Road
- Designated LFAM Dismounted Range
- Target Area
- Designated LFAM Mounted and Dismounted Range
- General LFAM Dismounted Area
- General LFAM Mounted and Dismounted Area

Figure 3.4-2
Observations of Special Status Species in the Vicinity of the Project Area

Sources: MCAS Yuma 2012, 2015; CNDDB 2013; NAVFAC SW 2013a

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Figure 3.4-2 shows recorded observations of special status species in the vicinity of the project area. Certain special status species have been excluded from lengthy, detailed analysis because they are not known to occur in the project area or, if they are present, are unlikely to be affected by the Proposed Action because they are migrant and/or transient visitors, their habitats would not be affected, or they occur in low densities. These species are summarized in Table 3.4-2.

Golden eagles are known to occur in the vicinity of the project area (see Figure 3.4-2). They nest on cliffs and in large trees in mountainous areas and forage over rolling foothills and valleys. Potential golden eagle foraging habitat occurs in the project area. They are most likely to occur in the area during migration in spring and fall.

During desert tortoise surveys conducted in support of this project (NAVFAC SW 2013a), the following special status wildlife species observations (other than desert tortoise) were made:

- Cooper's hawk (*Accipiter cooperi*) - one was observed in SWAT 4 flying through desert woodland. This medium-sized raptor can be both resident and migratory, but does not likely nest in the CMAGR (NAVFAC SW 2013a).
- Vaux's swift (*Chaetura vauxi*) - individual birds and one small flock of three were observed. This migratory species is considered to be incidental to the CMAGR, foraging over the area as the species passes through, but is not expected to nest (NAVFAC SW 2013a).
- Swainson's hawk (*Buteo swainsoni*) - observed on two occasions over SWAT 4. As a migrant, Swainson's hawks likely occur throughout CMAGR during spring and fall migration periods, but would not nest in the project area (NAVFAC SW 2013a).
- Loggerhead shrike (*Lanius ludovicianus*) - detected in 24 different places in the project area. They are likely to nest in desert woodlands and forage throughout SWATs 4 and 5 (NAVFAC SW 2013a).
- Burrowing owl (*Athene cunicularia*) - detected in 14 places on CMAGR in 2012 (see Figure 3.4-2). Although signs of burrowing owls were observed in three places in SWAT 4, they were most often encountered and detected in the northeastern portions of SWAT 5 (NAVFAC SW 2013a). Burrowing owls typically nest and live in mammal burrows in a variety of semi-arid environments (USFWS 2003).
- American badger (*Taxidea taxus*) – None observed but detections noted by diagnostic digs in 52 locations throughout SWATs 4 and 5 (see Figure 3.4-2). Badgers are likely more prevalent than recorded, as it is not unusual to detect American badger dig sites and not see the animals (NAVFAC SW 2013a).

Table 3.4-2. Special Status Species in the Vicinity of the Project Area

Common Name ***Scientific Name***	**Federal Status**	**State Status**	**Habitat**	**Potential to Occur in Project Area**
PLANTS				
Harwood's milk-vetch (*Astragalus insularis* var. *harwoodii*)	None	CRPR 2B.2	Desert dunes, desert wash, desert scrub	High
Emory's crucifixion-thorn (*Castela emoryi*)	None	CRPR 2B.2	Creosote scrub, bajadas, dry washes	Known to occur
Sand evening-primrose (*Chylismia arenaria*)	None	CRPR 2B.2	Desert scrub	Known to occur[1]
Las Animas colubrina (*Colubrina californica*)	None	CRPR 2B.3	Desert wash, desert scrub	High
Deep Canyon snapdragon (*Pseudorontium cyathiferum*)	None	CRPR 2B.3	Desert scrub, rocky habitats	Moderate
Orocopia sage (*Salvia greatae*)	None	CRPR 1B.3	Desert scrub	Known to occur[1]
Desert spike-moss (*Selaginella eremophila*)	None	CRPR 2B.2	Desert scrub, rocky habitats	High
AMPHIBIANS				
Sonoran desert toad (*Incilius alvarius*)	None	SC	Aquatic, artificial flowing waters, desert wash	Moderate
Couch's spadefoot (*Scaphiopus couchii*)	None	SC	Desert wash, mesquite woodland, creosote bush scrub	Moderate
REPTILES				
Desert tortoise (*Gopherus agassizii*)	T	T	Desert scrub	Known to occur[1]
Flat-tailed horned lizard (*Phrynosoma mcallii*)	None	SC	Desert scrub, low dunes, sandy substrates	Moderate
MAMMALS				
Pallid bat (*Antrozous pallidus*)	None	SC	Desert wash, desert scrub, riparian woodland	High
Western mastiff bat (*Eumops perotis californicus*)	None	SC	Various habitats	Known to occur
Western yellow bat (*Lasiurus xanthinus*)	None	SC	Desert wash	High
Pocketed free-tailed bat (*Nyctinomops femorosaccus*)	None	SC	Riparian scrub, desert scrub	Known to occur
Yuma hispid cotton rat (*Sigmodon hispidus eremicus*)	None	SC	Various habitats	Low
American badger (*Taxidea taxus*)	None	SC	Desert dunes, desert wash, desert scrub	Known to occur[1]
BIRDS				
Cooper's hawk (*Accipiter cooperii*)	None	WL	Woodlands, agricultural areas	Known to occur[1,2]
Golden eagle (*Aquila chrysaetos*)	BCC	FP	Forages in grassy and open shrub habitats, nests on cliffs and large trees	Moderate
Burrowing owl (*Athene cunicularia*)	BCC	SC	Desert scrub, grasslands, agricultural areas	Known to occur[1]
Swainson's hawk (*Buteo swainsoni*)	BCC	T	Grasslands, desert scrub, agricultural areas	Known to occur[1,2]
Vaux's swift (*Chaetura vauxi*)	None	SC	Forages over many habitats, nests in tree cavities and artificial structures	Known to occur[1,2]

Table 3.4-2. Special Status Species in the Vicinity of the Project Area

Common Name ***Scientific Name***	**Federal Status**	**State Status**	**Habitat**	**Potential to Occur in Project Area**
Mountain plover (*Charadrius montanus*)	BCC	SC	Chenopod scrub, grasslands, agricultural areas	Low[2]
Southwestern willow flycatcher (*Empidonax traillii extimus*)	E	E	Riparian habitats	Low[2]
Merlin (*Falco columbarius*)	None	WL	Grasslands, desert scrub, woodlands, agricultural areas	High[2]
Prairie falcon (*Falco mexicanus*)	BCC	WL	Desert scrub, grasslands, cliffs	High
Loggerhead shrike (*Lanius ludovicianus*)	BCC	SC	Desert wash, desert scrub, riparian woodland	Known to occur[1]
California black rail (*Laterallus jamaicensis coturniculus*)	BCC	T	Dense marsh habitats	None
Yuma clapper rail (*Rallus longirostris yumanensis*)	E	T	Dense marsh habitats	None
FISH				
Desert pupfish (*Cyprinodon macularius*)	E	E	Springs, seeps, slow-moving streams	None
Razorback sucker (*Xyrauchen texanus*)	E	E	Slow-moving streams, flooded lowlands	None

Notes: [1] Species observed during desert tortoise surveys conducted for this project (NAVFAC SW 2013a).
[2] Migratory and/or transient species
Status: Federal (determined by USFWS): T = Threatened, E = Endangered, BCC = Bird of Conservation Concern.
State: T = Threatened, R = Rare, SC = Species of Special Concern, WL = Watch List, FP = Fully Protected.
California Rare Plant Ranks (CRPR) created by the California Native Plant Society (CNPS):
1B - Plants rare, threatened, or endangered in California and elsewhere
2B - Plants rare, threatened, or endangered in California, but more common elsewhere
3 - Plants about which more information is needed – a review list
4 - Plants of limited distribution – a watch list
CNPS Threat Ranks
0.2 - Moderately threatened in California (20-80 percent occurrences threatened)
0.3 - Not very threatened in California (<20 percent of occurrences threatened or no current threats known)
Potential to occur in project area: Low = Little or no suitable habitat in the project area; Moderate = Suitable habitat, but not documented in the project area; High = Suitable habitat, or documented within or in the vicinity of the project area.
Sources: CNDDB 2011, 2013; CNPS 2014; NAVFAC SW 2013a; USFWS 2008.

Federally Listed Species

Based on the results of the CNDDB query and information from other sources (i.e., NAVFAC SW 2013a; DoN 2013; USMC 2012), the only federally listed species known to or likely to occur within the project area is the desert tortoise (see Table 3.4-2). The desert tortoise is described in detail below.

The endangered southwestern willow flycatcher (*Empidonax traillii extimus*) is known to be a transient visitor to the CMAGR (see Figure 3.4-2), but requires dense riparian habitats that do not occur in the project area. Although Yuma clapper rail (*Rallus longirostris yumanensis*), Desert pupfish (*Cyprinodon macularius*), and razorback sucker (*Xyrauchen texanus*), all federally listed species, are known to occur in the vicinity of the project area (see Figure 3.4-2), habitats for these species (dense marsh and permanent water features) do not occur in the project area and they would not be affected by the Proposed Action.

Desert Tortoise

Overview

The desert tortoise is the only federally listed species that occurs in the project area. With regards to desert tortoise impacts, incidental take of desert tortoises during military training throughout CMAGR is authorized in the 1996 BO (USFWS 1996). Under Section 7 of the ESA, the USMC is preparing a BA to address the effects of the Proposed Action on the desert tortoise. As discussed in Section 3.4.2.1, the Section 7 consultation process with the USFWS typically lasts between approximately 30 and 135 days.

Two species of desert tortoise have been described: Agassiz's desert tortoise and the Sonoran desert tortoise (*Gopherus morafkai*). Agassiz's desert tortoise occurs in southeastern California, southern Nevada, northwestern Arizona, and southwestern Utah. The Sonoran desert tortoise occurs east of the Colorado River in Arizona and into Mexico (Murphy et al. 2011). Agassiz's desert tortoise, then known as the Mojave population of the desert tortoise, was federally listed as threatened in April 1990 (USFWS 1990). Agassiz's desert tortoise (the desert tortoise) is the threatened species that occurs in the project area.

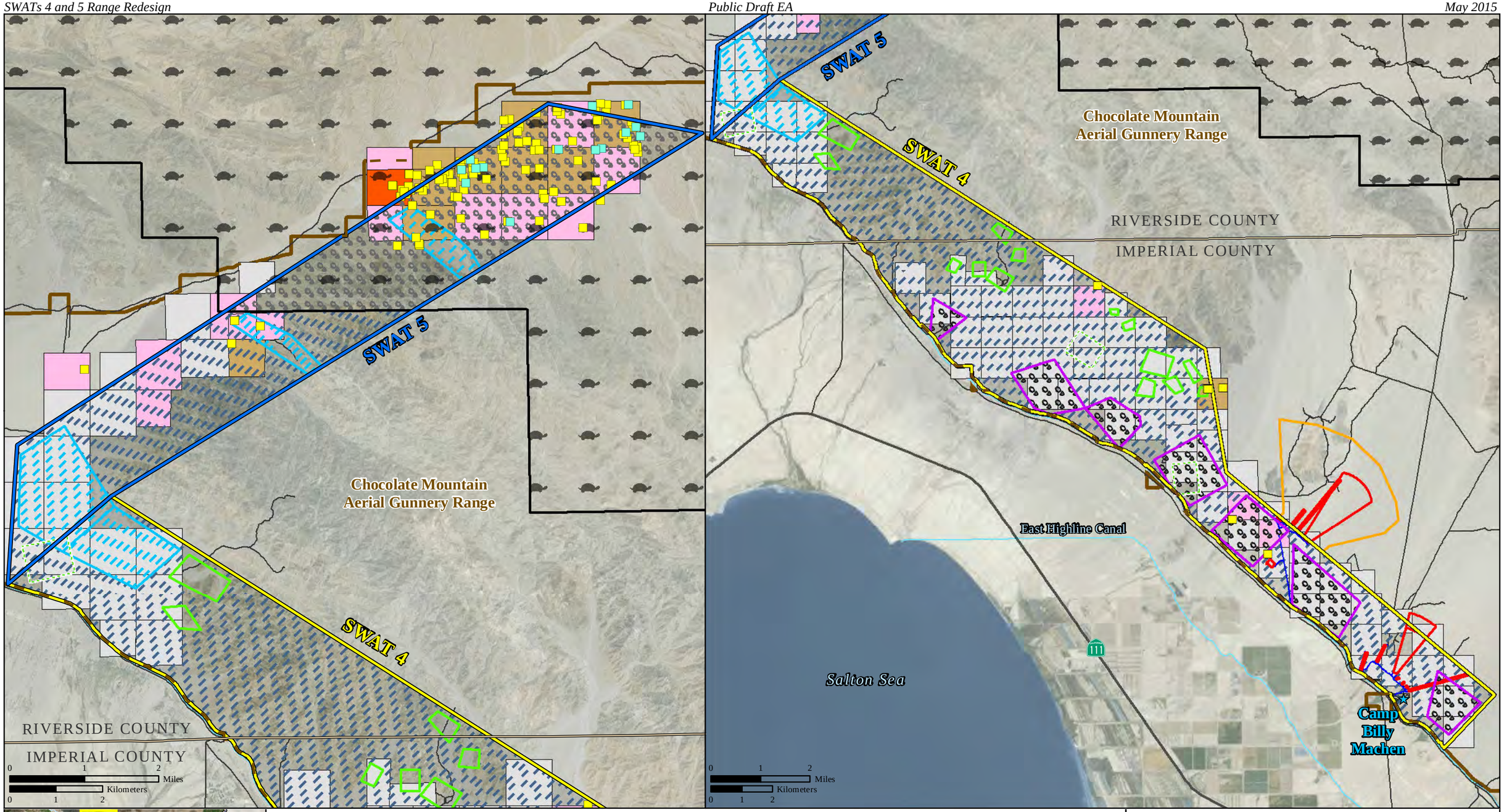
In the southern portion of its range, the desert tortoise occurs primarily in valleys, on alluvial fans or bajadas, rocky slopes, and in broad, well-developed washes with scattered shrubs and trees (USFWS 2011). The desert tortoise occurs within a variety of desert scrub vegetation types; however, the primary characteristic plant community is creosote bush scrub (USFWS 2011). They occur from sea level to an elevation of 7,300 ft (2,225 m); however, the most favorable habitat occurs at elevations of approximately 1,000 to 3,000 ft (305 to 914 m). Tortoises dig their own burrows and spend much of their lifetime in these burrows (USFWS 2011).

As shown on Figure 3.4-3, the vast majority (approximately 25,900 acres [10,500 ha], or 74 percent) of the project area is predicted to have low potential for desert tortoise occupancy based on a 2009 habitat potential model by the USGS. Approximately 5,200 acres (2,100 ha), or 15 percent of the project area, is predicted to have medium potential, and approximately 3,800 acres (1,500 ha), or 11 percent of the project area, is predicted to have high potential for desert tortoise occupancy (USGS 2009).

Threats

The greatest threat to the desert tortoise is habitat loss and degradation caused by human activities including urbanization, agricultural development, military training, recreational use, mining, livestock grazing, and a lack of regulatory mechanisms (USFWS 2011). Other known threats to the species include predation by common ravens (discussed below), canids (e.g., coyotes [*Canis latrans*], kit foxes [*Vulpes macrotis*] and dogs [*Canis familiaris*]), and golden eagles; collection by humans for pets or consumption; fire; collisions with vehicles on paved and unpaved roads; and mortality resulting from disease (e.g., upper respiratory tract disease) (USFWS 2011).

The common raven is becoming an increasing threat to the desert tortoise. Common ravens are "human commensals" and thrive in highly disturbed habitats including agriculture, suburban, and urban areas. Their reproductive success in the Mojave Desert is enhanced significantly by proximity to human developments. Ravens require elevated nesting locations (e.g., trees, utility poles, cliffs, and abandoned vehicles), adequate food, and water supplies within their nesting territories. Additionally, water subsidies are thought to be an important factor contributing to raven increases in desert areas of California.



Legend

Existing Features
- SWAT 4
- SWAT 5
- CMAGR Boundary
- Desert Tortoise Critical Habitat
- Road
- Overlapping SWAT 4 and CMAGR Boundaries
- County Boundary
- Canal
- Highway

Desert Tortoise Data from 2008 and 2012 Surveys
- Sightings
- Burrows
- 0 Tortoises/Square Kilometer
- 0 to 4 Tortoises/Square Kilometer
- 4 to 10 Tortoises/Square Kilometer
- 10 to 14 Tortoises/Square Kilometer

Proposed Features (Alt. 2)
- Parachute Drop Zone
- Static Range
- High Hazard Impact Area
- Access Road
- Designated LFAM Dismounted Range
- Target Area
- Designated LFAM Mounted and Dismounted Range
- General LFAM Dismounted Area
- General LFAM Mounted and Dismounted Area

Figure 3.4-3
Desert Tortoise Survey Results from 2008 and 2012 in the Project Area

Sources: Woodman 2008; USFWS 2010a; MCAS Yuma 2012, 2015; NAVFAC SW 2013a

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Subsidized water sources include cattle watering troughs, irrigation canals, reservoirs, sewage treatment areas, and irrigated agricultural areas. Guzzlers for wildlife can also contribute to raven water sources.

Fortunately, the CMAGR has poor resources to support adequate raven habitat. The surrounding CMAGR desert provides inadequate nesting locations. Water sources are few and far between, and there are relatively few large trees, only a handful of abandoned vehicles, and only one electrical utility line runs through the center of the range to provide nesting. The CMAGR is an isolated desert surrounded by large parcels of uninhabited, BLM- and State-owned lands. It serves as an aerial bombing range with live ammunition training, closing the area to any public use. This desert aerial and gunnery range is also largely devoid of any buildings or structures to represent foreign deserts and aid with the realism during training events. A lack of adequate water sources, nesting, food sources, human activity, agriculture, roosting perches, and the general remote location, has likely kept raven densities on CMAGR low. In an effort to thwart raven establishment, MCAS Yuma would employ the measures identified in Section 2.4 to discourage further settlement by common ravens.

Critical Habitat and the Eastern Colorado Recovery Unit

On February 8, 1994, the USFWS designated approximately 6.45 million acres (2.61 million ha) of critical habitat for the desert tortoise in portions of California (4.75 million acres [1.92 million ha]), Nevada (1.22 million acres [0.49 million ha]), Arizona (339 thousand acres [137 thousand ha]), and Utah (129 thousand acres [52.2 thousand ha]) (59 Federal Register 5820-5846, also see corrections in 59 Federal Register 9032-9036), which became effective on March 10, 1994.

On June 28, 1994, the USFWS approved the final Desert Tortoise (Mojave Population) Recovery Plan (Recovery Plan) (USFWS 1994a). The Recovery Plan divided the range of the desert tortoise into six recovery units and recommended establishing 14 Desert Wildlife Management Areas (DWMA) throughout the recovery units. Within each DWMA, the Recovery Plan recommended implementing reserve-level protection of desert tortoise populations and habitat while maintaining and protecting other sensitive species and ecosystem functions. The CMAGR overlaps a portion of the Eastern Colorado Recovery Unit, which is comprised of the Chuckwalla DWMA and critical habitat unit as well as a portion of the Joshua Tree DWMA and Pinto Basin critical habitat unit. This recovery unit occupies well-developed washes, desert pavements, piedmonts, and rocky slopes characterized by relatively species-rich succulent scrub, creosote bush scrub, and Blue Palo Verde-Ironwood-Smoke Tree communities.

Approximately 188,000 acres (76,081 ha), or 18.4 percent of the 1,020,600 acre (413,000 ha) Chuckwalla DWMA and critical habitat unit, lie within the northeastern half of the CMAGR (USFWS 1994a). Of this, approximately 4,320 acres (1,748 ha), or 0.42 percent of the DWMA and critical habitat unit, occur in SWAT 5 (see Figure 3.4-3). No critical habitat occurs within SWAT 4.

Tortoise Occurrence and Abundance in the Proposed Project Area

In 1994, the USFWS (1994a) estimated tortoise populations to range from 5 to 175 tortoises per square mile (approximately 1.9 to 67.6 tortoises per square kilometer [km^2]) throughout the range of the species. Previous surveys of desert tortoise critical habitat within the CMAGR have shown relatively high densities of desert tortoise (i.e., 35.7 per square mile [13.8 tortoises/km^2]) (USFWS 2012). More recent surveys in 2012, however, found a much lower density (i.e., 15.8 per square mile [6.1 tortoises/km^2]) in the same critical habitat (USFWS 2012a). Surveys of portions of SWAT 4 and SWAT 5 in 2008 estimated that the surveyed areas supported zero to very low densities of tortoises (Woodman 2008). This is most likely due to the low elevations of these areas rather than human disturbance (NAVFAC SW 2013a).

The 2008 surveys used Tortoise Regional Estimation of Density (TRED) methodology instead of USFWS protocol methodology (e.g., 100 percent Coverage or Probabilistic Sampling). TRED methodology had successfully been used at other military installations for this purpose (e.g., Fort Irwin National Training Center as performed by Dr. Alice Karl in 2002 [Karl 2002]), and the use of TRED methodology within SWATs 4 and 5 allowed for the proactive consideration of tortoise density during training range design. The USFWS concurred with use of the TRED methodology (USFWS 2012b).

In support of the Proposed Action, additional desert tortoise surveys were conducted within the project area in 2012 to supplement the earlier surveys conducted in 2008 (NAVFAC SW 2013a). Specifically, TRED methodology was used to survey approximately 11,120 acres (4,500 ha) that had not previously been surveyed. When combined, the 2008 and 2012 surveys cover the majority of SWATs 4 and 5 (66 percent and 58 percent, respectively); surveyed areas also represent the vast majority of areas that would be impacted by the Proposed Action, since surveys targeted areas with slopes below 20 percent that are more likely to be used for mounted training activities due to topography. The portions of SWATs 4 and 5 that have not yet been surveyed primarily consist of areas that (1) contain potential UXO, in which case they are not safe to survey; (2) contain steep slopes or mountains, in which case they are not safe to survey and neither vehicle use nor aircraft landings would occur under the Proposed Action due to the topography; or (3) consist of slivers of land along the edges of surveyed areas, especially when such slivers have little potential for tortoise occurrence based on elevation, previous survey results, modeled habitat based USGS (2009), and/or proximity to development or other anthropogenic disturbances. In March 2012, USFWS biologists agreed with the proposed approach to perform additional TRED surveys in those areas of SWATs 4 and 5 that were not surveyed by Woodman in 2008 (USFWS 2012b).

The 2012 tortoise density estimates statistically compliment Woodman's 2008 results. Tortoises are most common (roughly 8 to 31 adult tortoises per square mile [3 to 12 adult tortoises/km^2]) in the northeastern portion of SWAT 5, coinciding with tortoise critical habitat. Tortoise densities are somewhat lower (roughly 3 to 21 adult tortoises per square mile [1 to 8 adult tortoises/km^2]) in the central and southern portions of SWAT 5. Within SWAT 4, tortoises occur in low densities (roughly 3 to 8 adult tortoises per square mile [1 to 3 adult tortoises/km^2]) in hillside and mountainous areas along the northern boundary; however, most of the surveyed portions of SWAT 4 were devoid of any evidence of tortoises (NAVFAC SW 2013a) (see Figure 3.4-3).

3.4.4 Environmental Consequences

The significance of potential impacts to biological resources is based on: (1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource; (2) the proportion of the resource that would be affected relative to its occurrence in the region; (3) the sensitivity of the resource to proposed activities; and (4) the duration or ecological ramifications of the impact(s). Impacts to biological resources would be significant if species or habitats of concern were adversely affected over relatively large areas or if disturbances caused reductions in population size or distribution of a special status species. This section analyzes the potential for direct and indirect impacts to biological resources from implementation of the Proposed Action.

Direct impacts to biological resources from the Proposed Action would potentially occur in the following ways: by direct loss of and/or alteration of habitat from construction of static ranges and roads, and by use for military training exercises; by direct mortality, injury, or disruption of behavior (wildlife species) from construction related activities and military training exercises.

Indirect impacts are caused by or result from project-related activities, but occur later in time and can extend beyond the project footprint. Indirect impacts to biological resources from the Proposed Action could include gradual shifts in habitats and species occurrences as a result of continued use of specific areas for training activities. For instance, increased foot and vehicular traffic within LFAM areas could increase the likelihood of non-native plant dispersal, cause plant and wildlife populations to shift, and/or alter sedimentation or topography of areas that currently experience little disturbance.

AMMMs listed in Section 2.9 would be implemented to minimize impacts to biological resources under the Proposed Action.

3.4.4.1 Alternative 1

Construction

Plant Communities

Direct and permanent impacts to plant communities associated with construction of static ranges (cut/fill areas) and roads and use of borrow areas are presented in Table 3.4-3. The temporary batch plant would be near where the existing "H" building currently stands (see Figure 2-3; the "H" building will be demolished as part of a separate action) and would not impact plant communities. The primary plant communities impacted would be desert wash (102 acres [41 ha]) and desert bedrock cliff and outcrop (11 acres [4.6 ha]), both of which are abundant in the project area (see Table 3.4-1) and throughout the region. Plant communities throughout the project area are sparsely vegetated and very little plant life would be directly impacted by project construction (roads would follow the natural contour of the land and would avoid existing perennial plants as much as possible, and borrow areas are primarily covered by relatively small rocks or gravel and are largely devoid of plant life).

Table 3.4-3. Potential Direct Impacts to Plant Communities under the Proposed Action

Plant Community	Major Road	Minor Road	Maintenance Road	Cut/Fill Area	Borrow Area	TOTAL
Desert Active and Stabilized Dune	-	-	-	-	0.44 acres (0.18 ha)	**0.44 acres (0.18 ha)**
Desert Bedrock Cliff and Outcrop	1.24 acres (0.50 ha)	0.23 acres (0.09 ha)	0.74 acres (0.30 ha)	2.84 acres (1.15 ha)	6.33 acres (2.56 ha)	**11.39 acres (4.61 ha)**
Desert Pavement	0.02 acres (0.01 ha)	0.04 acres (0.02 ha)	-	-	-	**0.06 acres (0.02 ha)**
Desert Volcanic Rockland	-	-	-	-	0.87 acres (0.35 ha)	**0.87 acres (0.35 ha)**
Desert Wash	13.43 acres (5.43 ha)	3.95 acres (1.60 ha)	2.39 acres (0.97 ha)	32.82 acres (13.28 ha)	49.68 acres (20.10 ha)	**102.27 acres (41.39 ha)**
Sonora-Mojave Creosote Bush-White Bursage Desert Scrub	0.10 acres (0.04 ha)	0.09 acres (0.04 ha)	-	0.02 acres (0.01 ha)	-	**0.21 acres (0.08 ha)**
TOTAL	**14.79** acres (5.99 ha)	**4.32** acres (1.75 ha)	**3.13** acres (1.27 ha)	**35.69** acres (14.44 ha)	**57.33** acres (23.20 ha)	**115.26 acres (46.64 ha)**

Therefore, impacts to plant communities associated with construction activities under Alternative 1 would be less than significant.

Wildlife

Direct impacts to wildlife associated with construction under Alternative 1 would include temporary and, to a lesser degree, permanent displacement of a small number of birds, reptiles, and small mammals from the approximately 115 acres (47 ha) of habitat proposed for the cut/fill areas, borrow areas, and access

roads (see Table 3.4-3). The majority of the birds, reptiles, and small mammals impacted by construction would move away from the construction areas to adjacent similar habitats. Smaller, less mobile species, and those seeking refuge in burrows (e.g., rodents and reptiles) could inadvertently be killed during construction activities; however, long-term, permanent impacts to populations of such species would not result because these species are abundant in surrounding areas and would rapidly repopulate suitable habitat within the affected area. Borrow areas and roads would not present major barriers to dispersal, and once completed, would not prevent normal life behaviors.

Therefore, impacts to wildlife from construction activities under Alternative 1 would be less than significant.

Special Status Species

Desert Tortoise

As described above, construction activities would directly impact approximately 115 acres (47 ha) of desert tortoise habitat. None of this area is located within desert tortoise critical habitat, and no additional habitat would be directly impacted by proposed construction activities. However, additional area around the boundary of the proposed construction areas is likely to be indirectly impacted due to edge effects. Based on the survey results (NAVFAC SW 2013a), it is expected that the majority of the 115 acres (47 ha) that would be directly impacted is unoccupied and that a portion is occupied at a low density (0 to 4 tortoises/km^2; this equates to 0-0.04 tortoises/ha). Therefore, a small number of tortoises (approximately 1-2 based on density) may be expected to occur within the proposed construction areas. Tortoises in these areas could be crushed or buried as a result of construction, digging, and earth-moving activities. Implementation of the proposed AMMMs (Section 2.9), however, would minimize the potential to directly harm desert tortoises by requiring pre-construction clearance surveys at all proposed construction areas before commencing construction activities. Any tortoises found within a construction area would be relocated outside of the construction area by a USFWS-authorized biologist. The need to handle a tortoise in this circumstance would constitute a “take” by harassment, but the effect is expected to be a temporary stress to the animal that would not result in mortality.

The potential exists for desert tortoises to be injured or killed by construction vehicle activity. However, the AMMMs (Section 2.9) require that construction vehicles drive 20 miles (32 km) per hour or less in construction areas and on access roads. Speed limits would be clearly marked by the project proponent, and workers would be made aware of these speed limits. Also, vehicles parked in desert tortoise habitat would be inspected immediately before being moved. If a tortoise is found under a vehicle, the vehicle would not be moved until the desert tortoise leaves on its own accord or is safely relocated by the Tortoise Management Representative or qualified appointee.

As shown in Table 3.4-3, construction would create approximately 22 acres (9 ha) of new or expanded roads, all of which would occur in the southern half of SWAT 4. Over time, these roads could widen with use and thereby impact additional habitat. However, the resulting improved or constructed roads would not create significant barriers to tortoise movement or otherwise fragment tortoise habitat given (1) the sparse vegetation and previous disturbance found in the project area, (2) the relatively narrow width of the proposed roads (15 ft or 30 ft [5 m to 10 m]), (3) that roads would not be paved or bermed, and (4) that the proposed road expansion utilizes existing roads as much as possible.

Indirect impacts to desert tortoises and their habitat could occur if construction activities introduced invasive, non-native plant species to the project area. Many non-native plants thrive in disturbed soils, and their seeds are commonly transported on vehicles, wind, and water (Hobbs and Huenneke 1992; Gelbard

and Belnap 2003). Disturbed soils often form suitable habitat for these species, which also provide vegetative fuel that is more conducive to fire spread (Beatley 1966). Fires kill desert tortoises directly (Esque et al. 2003) and accelerate the conversion of shrub habitats into non-native annual grasslands, which in turn, facilitate spread of fire (Brooks 1999; Brooks and Esque 2002). Quantities of certain nutrients (e.g., nitrogen, some minerals, and carbohydrates) in non-native grasses are also lower than for forbs, and replacement of forbs in the diet of juvenile desert tortoises can lead to lower growth rates (Nagy et al. 1998; Hazard et al. 2009, 2010). Implementation of the proposed AMMMs (Section 2.9) would reduce the potential to spread invasive plant species by requiring the construction contractor to wash all vehicles and equipment before entering or re-entering the project areas.

Construction activities are also likely to have localized effects on drainage patterns, but these impacts would be minimized since (1) the proposed road expansion utilizes existing roads as much as possible, (2) roads would follow the natural contour of the land as much as possible, and (3) proposed static ranges were relocated to avoid ephemeral channels (drainages) and washes as much as possible following the December 2013 and January 2014 jurisdictional delineations. In addition, proposed construction activities would occur within the southern half of SWAT 4, which is crisscrossed by numerous dirt roads or trails, and any additional impact would be incremental.

Noise, ground vibration, and visual stimuli associated with proposed construction activities could also temporarily and directly affect a small number of tortoises adjacent to the proposed construction areas. Noises that are close, loud, sudden, and combined with a visual stimulus produce the most intense reactions in animals, but tortoises do not appear to be heavily affected by noise (Bowles et al. 1999). If desert tortoises perceive these disturbances as potential threats or sources of aggravation, these effects may lead to a disruption of natural behaviors, may inhibit desert tortoises from utilizing suitable habitat in the vicinity of such activities, may cause reluctance on the part of desert tortoises to move through an area subjected to such disturbances, or may cause desert tortoises to be displaced from these areas. These effects would be temporary, however, as they would cease upon completion of the construction project. Moreover, since only 5 percent of a desert tortoise's life is spent aboveground (Nagy and Medica 1986), there is little potential for noise or visual stimuli to impact tortoises for the vast majority of the year. These effects are also unlikely to cause mortality, and tortoises temporarily affected would be able to resume normal behaviors and to utilize areas from which they have been deterred by the activity. As such, noise associated with the proposed construction activities would not be likely to cause harm or behavioral effects that would rise to the level of take.

Indirect impacts to desert tortoise habitat would also result from construction activities as dust generated during construction could settle on vegetation, including the plants that tortoises eat. Dust generation associated with construction would be temporary as it would cease upon construction completion. The application of a dust palliative on all proposed roads during construction and a speed limit of 20 miles (32 km) per hour for construction vehicles would reduce the amount of dust generated. Furthermore, desert tortoises are almost constantly exposed to dust and sand, both above- and belowground. Given this, and that there is no evidence that particulate matter and/or fugitive dust increases the likelihood of transmission of upper respiratory tract disease in desert tortoises (Jacobson et al. 2014) the amount of dust over baseline levels generated by the Proposed Action would have a minimal impact on desert tortoises.

Indirect impacts to desert tortoises may result if tortoise predators (e.g., common ravens and canids) are attracted to the construction sites, which would increase the potential for predation on tortoises. With the implementation of the AMMMs (Section 2.9), the attraction of potential predators to the construction

areas would be greatly reduced by the control and management of trash associated with construction activities and personnel.

No construction activities would occur within designated desert tortoise critical habitat.

Therefore, for the reasons described above, construction activities associated with Alternative 1 would have the potential to adversely affect desert tortoises. However, with the implementation of the AMMMs (Section 2.9), impacts to desert tortoises from construction activities would be less than significant.

Other Special Status Species

Other special-status species have the potential to occur in the project area (see Table 3.4-2 and Figure 3.4-2). No special status species have populations that are restricted to the project area or adjacent lands. There are no known special status plant species that would be impacted by project construction. Impacts from construction activities to individual special status plants and wildlife would be identical to those described above for plant communities and wildlife. Special status wildlife species would be able to transit the project area post-construction and normal life behaviors would not be impacted. AMMMs listed in Section 2.9 would be implemented, including conducting construction in accordance with the MBTA to avoid impacts to nesting migratory birds within the project area. Therefore, impacts to special status species from construction activities would be less than significant.

<u>Training</u>

Plant Communities

Under Alternative 1, all of the plant communities and habitats in SWATs 4 and 5 and the HHIA (34,770 acres [14,070 ha]; see Table 3.4-1) would potentially be disturbed and degraded by mounted and dismounted training, use of explosives, and/or other training related activities. Impacts would be greatest in the proposed mounted ranges, in and around target areas, and within the HHIA. Under Alternative 1, mounted training would only occur in designated LFAM ranges (see Figure 2-2).

No new roads would be created outside of the CMAGR. Tactical vehicles would continue to access portions of SWATs 4 and 5 via existing public roads. Public roads that would be used include BLM and/or USBR roads that are currently used for transportation outside of the CMAGR and the Bradshaw Trail. Although NSWC estimates training tempo demand by FY 2017 would increase approximately 28 percent from the current annual training throughput, this is not expected to substantially increase the overall number of annual vehicle miles traveled on public roads. Consistent with the AMMMs identified in Section 2.9, tactical vehicles would continue to abide by posted speed limits (e.g., 20 miles [32 km] per hour in critical habitat and along major, minor, and maintenance access roads) and would stay within the confines of road boundaries until reaching designated ranges, to reduce potential impacts. Therefore, compared to current conditions, use of the proposed access roads in SWAT 4, as well as the relatively small increase in the use of public roads, would negligibly increase impacts to plant communities with implementation of Alternative 1.

Vehicle use (mounted training), foot traffic (dismounted training), and ordnance use under Alternative 1 could result in the crushing, breaking, and removal of plants; a reduction of overall vegetative cover; and the erosion and/or compaction of topsoil. Natural recovery of desert vegetation is very slow (potentially hundreds of years) following disturbance because of the limited resources available to plants in desert ecosystems (Lovich and Bainbridge 1999).

Soil contamination within the project area could result from vehicle and ordnance use. Vehicles and equipment standing, parked, or used in the project area could potentially leak small amounts of fuel and

petroleum, oils and lubricants into the soil. However, vehicles and equipment would rarely be stationary and ordnance would either be confined to established ranges or would be relatively dispersed over a large area (SWATs 4 and 5). Moreover, based on estimated munitions constituent concentrations, existing contamination is several orders of magnitude below toxicity thresholds for biological receptors, including the wildlife guzzlers (USMC 2008b). As such, soil contamination resulting from implementation of the proposed project would be minor.

Particulate matter, fugitive dust, and/or sediment generated by vehicle and ordnance use can reduce the photosynthetic capacity of affected plants, potentially reducing growth and vigor (Sharifi et al. 1997; Ouren et al. 2007). However, dust can increase net photosynthesis early in the growing season (when water is more available) by increasing leaf temperature (Upekala et al. 2009). Overall, particulate matter generation associated with vehicle use and ordnance deployment is expected to cause plant productivity to decrease in localized areas. However, windblown dust and sand regularly occur in desert environments. As such, based on the localized nature of the impacts, the amount of dust over baseline levels generated by the Proposed Action would be negligible.

Rotary-wing and tilt-rotor aircraft training would result in the temporary disturbance of loose surface debris and soil caused by downdraft and outwash from moving rotors (collectively known as rotorwash) in the vicinity of take-offs, landings, and near-surface hovering, potentially resulting in an indirect impact to vegetation and soils. Rotorwash forces are relative to the engine power settings and the aircraft's proximity to the ground, and the MV-22 would generate higher rotorwash wind speeds than the CH-46 that it is currently replacing. For example, the 2009 Home Basing EIS found that rotorwash from the MV-22 would be up to 10 percent greater than the CH-53 and potentially three to four times greater than the CH-46. These wind velocities could reach 90 knots (103.6 miles per hour) directly below the MV-22 when hovering at 100 ft (30.48 m) above ground level (Marine Corps Installation West [MCIWEST] 2009 as cited in USMC 2013).

As recorded from direct field observations, typical effects resulting from MV-22 rotorwash ranged from windblown vegetation to broken branches in shrubs and trees. In extreme cases, soil was scoured to the extent that small shrubs were uprooted or nearly uprooted. Dust cloud development from the displacement of top soil and loose vegetation was another common effect from rotorwash. The intensity of these effects would be proportional to the amount of time the area is exposed to these high velocity winds and the amount of vegetation (or wildlife, including tortoises) that actually occur within a given landing area.

Heat radiating from engine nacelles while landing, departing, or idling can cause vegetation to wilt or become desiccated, toasted, or charred (USMC 2013). Under normal operations, however, with engine exhaust deflectors operating, the exhaust of the MV-22 should not heat the ground to a temperature high enough to support combustion of plant based materials such as dry grasses (USMC and U.S. Forest Service 2013). This is because exhaust deflectors activate as soon as there is weight on the main landing gear wheels, thereby ensuring that the aircraft operates with the exhaust deflectors on at all times when on the ground and reducing the potential for wildfire ignition to low (Marine Corps Air Ground Combat Center 2010).

Although effects on vegetation from the use of MV-22s would be direct, they would also be minor as (1) they would be localized under the landing site; (2) pilots would avoid landing sites with vegetation or other vertical obstacles as much as possible; (3) SWAT 5, and especially SWAT 4, are sparsely vegetated; (4) the USMC anticipates that most MV-22 landing operations, such as insertions/extractions, would take less than three minutes; (5) effects associated with MV-22 landings would otherwise be similar to those

of legacy rotary-wing aircraft currently operating in the project area; (6) MV-22 aircrews can throttle back to 75 percent of engine power, and maintain a 75-degree angle to the nacelles, while on the ground to substantially reduce rotorwash wind speeds and deconcentrate engine heat exhaust; and (7) exhaust deflectors would automatically be deployed when on the ground.

Similar to construction activities (refer to Section 5.2.1), ground disturbance associated with training activities under Alternative 1 could increase the likelihood of non-native plant dispersal and establishment by increasing the amount of disturbed habitat for such species to occur in, which could reduce forage cover available directly by outcompeting native vegetation or indirectly by increasing the risk of fire.

Given the above, ground disturbance associated with long term training activities under Alternative 1 would likely reduce the cover and productivity of native plant communities, primarily in the designated mounted/dismounted LFAM ranges, where vehicle disturbance would be concentrated. However, the area of vegetation that would potentially be heavily disturbed under Alternative 1 comprises a small portion of the total project area. In addition, much of the project area currently experiences disturbance from military activity. Therefore, impacts to plant communities from training activities under Alternative 1 would be less than significant.

Wildlife

Vehicle and aircraft movement and ordnance use associated with training under Alternative 1 could result in wildlife injury/mortality and loss of habitat. Impacts would be greatest in the proposed mounted ranges, in and around target areas, and within the HHIA. Under Alternative 1, mounted training would only occur in designated LFAM ranges (see Figure 2-2). As described above, habitat degradation would also occur throughout the project area.

Access roads would be at-grade dirt roads that would be infrequently used. When not in use, access roads would not present barriers to wildlife movement in an area already characterized by naturally occurring sparse vegetation.

A considerable number of bird species that utilize resources in the project area do so during migration or as passing vagrants, and are not permanent residents. Bird species known to regularly utilize the project area are considered fairly common and widespread. Training activities under Alternative 1 may eliminate visitation by certain bird species or reduce the amount of time they spend in the project area. However, displacement of these species during training exercises would not be considered substantial.

Under Alternative 1, there would be an increase in fixed-, rotary-, and tilt-wing aircraft operations over SWATs 4 and 5 in support of ground training (Table 2-6). Therefore, there would be an increased likelihood of bird/bat-aircraft strikes. Bats would be less likely to strike aircraft, as the majority of aircraft operations would occur during daytime hours. Because fixed-wing aircraft typically fly above the airspace (and altitudes) typically used by birds and bats during normal flight activity patterns, bird/bat-aircraft strikes are more likely to occur with rotary-wing and tilt-rotor aircraft than fixed-wing aircraft (Washburn et al. 2012). However, low-level rotary-wing and tilt-rotor aircraft operations already occur over SWATs 4 and 5 and the Proposed Action would be an incremental increase to existing aircraft operations.

Use of aircraft, particularly low-level flights and landings/takeoffs would cause noise and visual disturbance to wildlife. Impacts to wildlife from aircraft noise and visual stressors can include: a startle reflex that induces running or flight, increased expenditure of energy, decreased time and energy spent on life functions such as feeding and mating, increased likelihood of predation, and interruption of breeding or nursing behavior (Efroymson et al. 2000; Larkin 1996). Effects related to rotor wash and noise from rotary-wing and tilt-rotor aircraft would diminish with distance from the source, and exposure to elevated

noise levels would generally be localized around landings, take-offs, and low-level hovering but diminish with distance.

Noises that are close, loud, sudden, and combined with a visual stimulus produce the most intense reactions in animals (Bowles et al. 1999). Rotary-wing and tilt-rotor aircraft generally induce the startle effect more frequently than fixed-wing aircraft (Frid 2003). Some bird and mammal species habituate to repetitive noises, especially noise associated with overflight of fixed-wing aircraft, better than other species (Conomy et al. 1998; Krausman et al. 1996). The 2009 Home Basing EIS found that the noise levels between the CH-46 and the MV-22 were not significantly different and that noise levels during MV-22 overflights were lower than CH-46 noise levels when cruising at equivalent altitude and during approach, although the maximum noise level was slightly greater for the MV-22 during landing (MCIWEST 2009). As the Proposed Action would allow continued landing of rotary-wing aircraft throughout SWATs 4 and 5, subject to environmental constraints (i.e., areas with slope greater than 30 degrees), it is assumed that wildlife in the project area is already partially habituated to such visual and aural disturbance.

As training activities already occur in the project area and with implementation of AMMMs (Section 2.9), impacts to wildlife associated with training under Alternative 1 would be less than significant.

Special Status Species

Desert Tortoise

Direct and Indirect Impacts. Impacts to desert tortoises and their habitat include those described above for plant communities and wildlife. In addition, the surface disturbance and reduced plant cover described may also facilitate detection of hatchling and juvenile desert tortoises by predators such as ravens and coyotes. Impacts would be greatest in the proposed mounted ranges, in and around target areas, and within the HHIA.

Impacts to desert tortoises include incidental disruption of normal activities and the potential for incidental injury or death due to vehicle movement, helicopter landings, and ordnance use. Training activities could crush tortoises, crush or collapse tortoise burrows, and crush vegetation (discussed above). While direct evidence of military vehicle-related desert tortoise mortality is limited, there is ample indirect evidence via damage to vegetation that such effects occur (Boarman 2002). If vegetation is crushed, then desert tortoises, which reside in close association with shrubs, can also be crushed.

Desert tortoises, however, may be protected from these impacts by choice of burrow or cover site, particularly when caliche washes or rock outcrops are selected. At a site in Fort Irwin which regularly experiences force on force training by troops with tanks and other vehicles, Berry et al. (2006) observed that rock shelters and natural caves used by desert tortoises were generally not prone to destruction resulting from military training, while 20 out of 67 soil burrows in an area of active training were found collapsed or were damaged by training. At the CMAGR, most cover sites found during the 2013 surveys were in caliche caves (NAVFAC SW 2013a). Therefore, the chances of injury and mortality from mounted and dismounted training activities under the Proposed Action would be expected to be low, especially when considering that much of the project area is currently used for training purposes and that only 5 percent of a desert tortoise's life is spent aboveground (Nagy and Medica 1986).

No new roads would be created outside of the CMAGR. Tactical vehicles would continue to access portions of SWATs 4 and 5 via existing public roads. Public roads that would be used include BLM and/or USBR roads that are currently used for transportation outside of the CMAGR and the Bradshaw

Trail. Although NSWC estimates training tempo demand by FY 2017 would increase approximately 28 percent from the current annual training throughput, this is not expected to substantially increase the overall number of annual vehicle miles traveled on public roads. Consistent with the AMMMs identified in Section 2.9, tactical vehicles would continue to abide by posted speed limits (e.g., 20 miles [32 km] per hour in critical habitat and along major, minor, and maintenance access roads) and would stay within the confines of road boundaries until reaching designated ranges, to reduce potential impacts. Therefore, compared to current conditions, use of the proposed access roads in SWAT 4, as well as the relatively small increase in the use of public roads, would negligibly increase impacts to desert tortoises with implementation of Alternative 1.

Desert tortoises would be exposed to increased amounts of particulate matter, fugitive dust, and/or sediment generated by vehicle (including MV-22) and ordnance use. However only 5 percent of a desert tortoise's life is spent aboveground (Nagy and Medica 1986), and desert tortoises are almost constantly exposed to dust and sand, both above- and belowground. By comparison, the airborne sand and dust from training events would affect relatively small areas for brief periods, during which a tortoise in the vicinity would probably retract into its shell, with little likelihood of respiratory interference. In addition, there is no evidence that particulate matter and/or fugitive dust increases the likelihood of transmission of upper respiratory tract disease in desert tortoises (Jacobson et al. 2014).

The increased rotorwash that would result from use of the MV-22 instead of the CH-46 is described above. The increased rotorwash would also incrementally increase habitat disturbance and short-term desert tortoise harassment if any were located in the vicinity of an MV-22 during training operations. These effects, however, are expected to be minor as (1) they would be localized under the landing site; (2) pilots would avoid landing sites with vegetation or other vertical obstacles as much as possible; (3) SWAT 5, and especially SWAT 4, are sparsely vegetated; (4) tortoises are less likely to occur in sparsely-vegetated habitat, and SWAT 4 in particular contains very few desert tortoises; (5) due to environmental (e.g., topographical) constraints, SWAT 5 would rarely be used; (6) the USMC anticipates that most MV-22 landing operations, such as insertions/extractions, would take less than three minutes; (7) effects associated with MV-22 landings would otherwise be similar to those of legacy rotary-wing aircraft currently operating in the project area; (8) MV-22 aircrews can throttle back to 75 percent of engine power, and maintain a 75-degree angle to the nacelles, while on the ground to substantially reduce rotorwash wind speeds and deconcentrate engine heat exhaust; (9) exhaust deflectors would automatically be deployed when on the ground; and (10) MV-22s would not be authorized to land within desert tortoise critical habitat. As such, the use of MV-22s is not expected to appreciably degrade the overall carrying capacity for desert tortoises on the CMAGR.

As described above, noises that are close, loud, sudden, and combined with a visual stimulus produce the most intense reactions in animals (Bowles et al. 1999). Rotary-wing and tilt-rotor aircraft generally induce the startle effect more frequently than fixed-wing aircraft (Gladwin et al. 1988; Ward et al. 1999). The 2009 Home Basing EIS found that the noise levels between the CH-46 and the MV-22 were not significantly different and that noise levels during MV-22 overflights were lower than CH-46 noise levels when cruising at equivalent altitude and during approach, although the maximum noise level was slightly greater for the MV-22 during landing (MCIWEST 2009). Most of the project area has previously been used for maneuver and/or live-fire training activities, and although Alternative 1 represents an increase in the tempo and magnitude of ongoing noise disturbances, there is little potential for noise or visual stimuli to impact tortoises for the vast majority of the year for the following reasons: (1) only 5 percent of a desert tortoise's life is spent aboveground (Nagy and Medica 1986), (2) tortoises do not appear to be

heavily affected by noise (Bowles et al. 1999), (3) the proposed activities would not be continuous as they would occur sporadically throughout the year, and (4) disturbance would cease upon training event completion. These effects are also unlikely to cause mortality, and tortoises temporarily affected would be able to resume normal behaviors and to utilize areas from which they have been deterred by the activity. As such, any effect that noise associated with the proposed training activities might have on desert tortoises is expected to be minimal and would not cause stress or behavioral reactions that would rise to the level of take under the ESA.

Military use of the CMAGR excludes or reduces other human activities that can adversely affect tortoises and their habitat, such as mining, off-road recreation, and vehicular traffic associated with paved road networks.

In summary, some desert tortoise injury and mortality could occur even with the implementation of all proposed measures (see Section 2.9). Incidental take could also occur by way of animal handling if translocation of tortoises should become necessary during construction or operational activities, as such handling can induce stress as indicated by the voiding of the bladder (USMC 2011). Since desert tortoises store much of their water in their bladders, this can lead to an increase in the potential for dehydration (Jørgensen 1998). However, desert tortoises at other military installations (e.g., the 29 Palms Combat Center) have been moved out of harm's way on numerous occasions. Generally, these tortoises were moved only short distances and showed no adverse effect (Henen 2010, as cited in USMC 2011).

Impacts to Desert Tortoise Critical Habitat. Some of the proposed training activities would occur in 4,320 acres (1,748 ha), or 0.42 percent, of the 1,020,600-acre (413,000 ha) Chuckwalla DWMA desert tortoise critical habitat unit. Within this area, mounted and dismounted LFAM training would occur within the 291.5-acre (118 ha) S-5-3 training range; the remaining area (4,028.5 acres [1,630 ha]) would be used for dismounted LFAM training.

Dismounted maneuvering is currently permitted throughout SWATs 4 and 5, including desert tortoise critical habitat. Increasing annual personnel throughput by 28 percent within these areas would proportionally increase habitat disturbance and degradation. Dismounted live-fire training within proposed LFAM areas, including within critical habitat, would increase the rate of habitat degradation and take of tortoises through the establishment of target areas and the execution of training. Target areas could consist of up to two dozen temporary target structures and/or Portable Infantry Target Systems. All targets would be removed at the conclusion of the exercise, although plywood and other heavier materials (except for metal) would remain in the target areas. Dismounted LFAM activities would include the use of small arms within dismounted LFAM areas and ranges. No grenades or grenade launchers would be used during LFAM training activities.

Mounted LFAM training within Range S-5-3 occurred previously for four mounted training exercises in 2007 and for seven training exercises in 2008. The proposed mounted LFAM training within S-5-3 would primarily occur within both desert wash that is sparsely vegetated and bajada that is vegetated with creosote bush-white bursage desert scrub. Desert wash within this area is characterized by loose sand that is bordered by banks and/or rock outcrops on both sides. Natural processes (primarily storm events) disturb the wash on a roughly annual basis. The creosote bush-white bursage desert scrub found on the bajada appears to be relatively intact, with the exception that many crisscrossing off-road vehicle tracks occur throughout the area, as evidenced by Google Earth aerial imagery from June 2012. The source of these tracks is unknown and could be from illegal civilian use of the area.

The vast majority of the tortoises and tortoise burrows detected in training Range S-5-3 were found on or adjacent to steep rock outcrops along the edges of the range; these areas are unlikely to be affected directly by mounted training activities due to its steep topography. Indeed, tortoise sign was less common or absent from wash areas throughout all portions of SWAT 5 surveyed in 2012 (NAVFAC SW 2013a). As such, it is expected that tortoises will forage within and travel through the desert wash and bajada in Range S-5-3 that would be affected by proposed training activities, particularly during wet years when a greater number of annuals are available for forage. Most of the proposed training, however, would occur throughout SWATs 4 and 5 and would not be concentrated within desert tortoise critical habitat or Range S-5-3.

For the reasons described above, implementation of Alternative 1 would affect a relatively small area of desert tortoise critical habitat (0.42 percent of the critical habitat unit). Given the limited geographic scope of the impacts within critical habitat and the area's existing value, the Proposed Action is not likely to appreciably diminish the conservation value of the critical habitat unit or preclude or significantly delay the development of the physical or biological features identified above that support the life-history needs of the species for recovery. As such, implementation of the Proposed Action would not result in adverse modification to desert tortoise critical habitat.

Conclusion. The BA for this project (Appendix E – to be provided in the Final EA) contains a more detailed analysis based on Alternative 2, which would have more widespread impacts (see Section 3.4.4.2 below). Based on the analysis, the BA concludes that there would be adverse effects with the potential for takes. The USMC, in compliance with Section 7 of the ESA, has submitted the BA to USFWS and is engaged in formal consultation regarding these potential effects under Alternative 2. Should the USMC instead select Alternative 1 for implementation, the BA would be revised and resubmitted to the USFWS as part of the formal consultation process. With the implementation of the proposed AMMMs (Section 2.9) and other requirements of the forthcoming Biological Opinion, the implementation of Alternative 1 would not have a significant impact on the desert tortoise.

Other Special Status Species

As was previously discussed, other special-status species have the potential to occur in the project area (see Table 3.4-2 and Figure 3.4-2). No special status species have populations that are restricted to the project area or adjacent lands. Impacts from training under Alternative 1 to individual special status plants and wildlife would be identical to those described above for plant communities and wildlife.

With the implementation of AMMMs (Section 2.9), impacts to special status species associated with training under Alternative 1 would be less than significant.

3.4.4.2 Alternative 2

Construction

Proposed construction impacts under Alternative 2 would be the same as presented for Alternative 1.

Training

Plant Communities

Impacts to plant communities under Alternative 2 would be similar in nature to those under Alternative 1, with the exception that under Alternative 2, mounted training exercises would be permitted over much larger areas of SWATs 4 and 5. Therefore, the implementation of Alternative 2 would expose more vegetation and habitats to disturbance at a less intense or concentrated rate. For example, as mounted

training exercises would not be restricted to designated LFAM areas, vehicular disturbance would be more dispersed. Since much of the project area currently experiences ground disturbances from military activity, impacts to plant communities associated with training under Alternative 2 would be less than significant.

Wildlife

Impacts to wildlife under Alternative 2 would be similar in nature to those under Alternative 1, with the exception that under Alternative 2, mounted training exercises would be permitted over much larger areas of SWATs 4 and 5. Therefore, the implementation of Alternative 2 would expose more wildlife to disturbance at a less intense or concentrated rate. For example, as mounted training exercises would not be restricted to designated LFAM areas, vehicular disturbance would be more dispersed. Since much of the project area currently experiences ground disturbances from military activity, impacts to wildlife associated with training under Alternative 2 would be less than significant.

Special Status Species

Desert Tortoise

Impacts to desert tortoises under Alternative 2 would be similar in nature to those under Alternative 1, with the exception that under Alternative 2, mounted training exercises would be permitted over much larger areas of SWATs 4 and 5. Therefore, the implementation of Alternative 2 would expose more tortoises to disturbance at a less intense or concentrated rate. For example, as mounted training exercises would not be restricted to designated LFAM areas, vehicular disturbance would be more dispersed. There would be adverse effects to the desert tortoise with the potential for takes. The USMC, in compliance with Section 7 of the ESA, has submitted the BA to USFWS and is engaged in formal consultation regarding these potential effects. With the implementation of the proposed AMMMs (Section 2.9) and other requirements of the forthcoming Biological Opinion, the implementation of Alternative 2 would not have a significant impact on the desert tortoise.

Other Special Status Species

No other special status species have populations that are restricted to the project area or adjacent lands. Impacts from training under Alternative 2 to individual special status plants and wildlife would be identical to those described above for plant communities and wildlife. With the implementation of AMMMs (Section 2.9), impacts to special status species associated with training under Alternative 2 would be less than significant.

3.4.4.3 No-Action Alternative

Under the No-Action Alternative, no new construction would occur and existing training regimes at the CMAGR would remain unchanged, resulting in localized impacts to biological resources. With respect to the desert tortoise, training would continue to be directed by the 1996 BO (USFWS 1996). Therefore, implementation of the No-Action Alternative would not have a significant impact to biological resources.

3.5 CULTURAL RESOURCES

3.5.1 Definition of Resource

Cultural resources is an inclusive label used to encompass any historic properties or traditional cultural properties and sacred sites valued by traditional communities most often associated with Indian Tribes.

Cultural resources are finite, nonrenewable resources, whose salient characteristics are easily diminished by physical disturbance; certain types of cultural resources also may be negatively affected by visual, auditory, and atmospheric intrusions.

Historic properties are defined in the federal regulations outlining Section 106 of the NHPA, as amended (54 USC 306108 *et seq.*), 36 CFR 800, as prehistoric and historic sites, buildings, structures, districts, or objects listed or eligible for listing on the National Register of Historic Places (NRHP), as well as artifacts, records, and remains related to such properties. Compliance with Section 106 of the NHPA, which directs federal agencies to take into account the effect of a federal undertaking on a historic property, is outlined in the Advisory Council on Historic Preservation's regulations, *Protection of Historic Properties* (36 CFR Part 800). A traditional cultural property can be defined generally as one that is eligible for inclusion in the NRHP because of its association with cultural practices or beliefs of a living community that are rooted in that community's history and are important in maintaining the continuing cultural identity of the community.

To be eligible for the NRHP, a property must possess integrity of location, design, setting, workmanship, feeling, and association, and meet the criteria for evaluation in at least one area of significance as defined by the *Secretary of the Interior's Standards for Evaluation* (36 CFR 60):

> (a) associated with events that have made a significant contribution to the broad patterns of American history; or
>
> (b) associated with the lives of persons significant in our past; or
>
> (c) embody the distinctive characteristic of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic value, or that represent a significant or distinguishable entity whose components may lack individual distinction; or
>
> (d) have yielded, or may likely yield, information important in prehistory or history.

Once the NRHP-eligibility of the properties has been determined, the federal agency must assess the effects that the undertaking or proposed action may have on any historic properties (i.e., a finding of effect). Through consultation with federally recognized tribes who assert ancestral ties to the area, the federal agency attempts to identify any traditional cultural properties and sacred sites that may be affected by the undertaking. The agency then seeks concurrence from the SHPO on their determinations and findings.

3.5.2 Affected Environment

The affected environment for cultural resources is based on the establishment of the area of potential effects (APE) of an undertaking, through consultation with SHPO. An APE is defined in 36 CFR 800.16(d) as "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist." The APE, and therefore the affected environment, for the proposed action includes 32,536 acres (13,166.9 ha), which is the total acreages of SWATs 4 and 5 as well as the affected portion of R-2507N (see Figures 2-2 and 2-4). This area encompasses all of the locations for the various elements of the action alternatives including proposed range and support facilities construction, and training areas.

3.5.2.1 Prehistoric and Historic Setting

This brief outline of the cultural context for the Colorado Desert is drawn from Schaefer and Dalope's 2011 survey (Schaefer and Dalope 2011b).

Regional Prehistory

The regional prehistory is divided into the Paleo-Indian (or Early), Archaic, and Late Prehistoric periods.

The Paleo-Indian period ranges from approximately 12,000 BC to 5000 BC. This period is represented by an artifact assemblage known as the San Dieguito complex that consists almost entirely of flaked stone tools associated with a hunting and gathering economy, including the hunting of big game.

The Archaic period ranges from 5000 BC to AD 700. This period is generally characterized as a time when regional adaptations became well established within diverse local conditions, but is not well represented in the Colorado Desert region.

The Late Prehistoric period in the Colorado Desert is represented by the Patayan I cultural complex, which dates roughly from AD 700 to the historic period. This period is characterized by marked changes in human settlement patterns, economic system, and the artifact assemblage. Artifacts typically encountered from this period include paddle and anvil ceramics and small projectile points indicative of adoption of the bow and arrow. Subsistence included floodplain horticulture featuring maize, beans, squash, and other crops (Schaefer and Dalope 2011b).

History of the CMAGR Area

As early as 1539, the Spanish began to explore parts of California, and were the first Europeans to venture into the region surrounding the Chocolate Mountain Range. Spanish exploration for the next 200 years was intermittent in this area as California was considered remote and difficult to access. In the late 1700s, various Spanish expeditions led by Father Francisco Garcés (1771), Pedro Fages (1772), and Captain Juan Bautista de Anza (1774) established overland routes, opening up the region to travel, but the desert conditions were still too harsh for Euro-American settlement.

Development in the Colorado Desert was largely dependent on transportation and water. With the discovery of gold in California in 1848, an influx of immigrants from the east into California led to the establishment of wagon roads, a mail route, and a stage line along de Anza's route. By 1862, a route to Yuma from Dos Palmas along the east side of the Salton Basin ran south of the Chocolate Mountains, and an overland stage route from San Bernardino to La Paz skirted the northern edges of the Chocolate Mountains. By 1868, the Castle Dome cutoff route through the Chocolate Mountains was in use. Transportation to and through the area advanced further with the 1872 construction of the Southern Pacific Railroad from Los Angeles to present-day Indio and Yuma, and the 1881 linking of the Southern Pacific and the Atchison, Topeka, and Santa Fe railroads. The railroads provided a quick and easy access to the Chocolate Mountains region for mining, which was at its peak between 1890 and 1910, and again during the depression era of the 1930s.

A canal along the old Alamo River channel was completed in 1901, carrying water from the Colorado River to what was then renamed the Imperial Valley, providing a viable water source to support agricultural development and settlement. Populations increased in the area, and El Centro was established in 1905. The Salton Sea was inadvertently created when attempts to cut a new channel to relieve silting of the Alamo Canal led to the accidental flow of the Colorado River into the Imperial Valley between 1904 and 1907.

Military training use of the CMAGR region began during World War II when General George S. Patton, Jr., established the Desert Training Center/California-Arizona Maneuver Area, encompassing 18,000 square miles in southeastern California, western Arizona, and southern Nevada, for training in desert survival and warfare. In addition to Army's use of the area, the Navy established Camp Dunlap as a Marine artillery training base, which expanded to include portions of the Chocolate Mountains and later became the CMAGR. The CMAGR land and airspace have served as a bombing range since World War II.

3.5.2.2 Cultural Resources within the Affected Environment

Through a combination of cultural resource studies carried out to comply with Sections 106 and 110 of the NHPA, the majority (approximately 66 percent) of the APE (SWATs 4 and 5 and the affected portion of R-2507N) have been inventoried for cultural resources. These studies include large-scale survey efforts conducted between 2009 and 2014 (Schaefer and Dalope 2011a, 2011b; NAVFAC SW 2013b, 2014a) and include all of the areas of proposed construction. Two areas within SWAT 4 (188 acres [76 ha]) and R-2507N (93 acres [37.6 ha]), could not be surveyed due to restricted access for safety reasons. Approximately 5,107 acres (2,066.7 ha) were comprised of slopes greater than 30 percent and were deemed too dangerous for pedestrian survey. A total of 1,500 acres (607 ha) within desert tortoise critical habitat were not surveyed and 1,999 acres (808.9 ha) located within the HHIA, but outside of the target areas, were also not surveyed.

Traditional Cultural Resources

As part of this EA, MCAS Yuma is consulting with federally-recognized Indian Tribes who assert ancestral ties to the CMAGR region to identify traditional cultural resources in the APE (Appendix A). The APE does not contain any known traditional cultural properties or sacred sites.

Historic Buildings and Structures

No historic buildings or structures are located in or immediately adjacent to the APE.

Archaeological Resources

Cultural resources surveys in the APE resulted in the identification and recording of 56 archaeological sites within the boundaries of SWATs 4 and 5 and the affected portions of R-2507N. These sites date to both the prehistoric and historic periods. Prehistoric sites include petroglyphs, bone scatters, ceramic scatters, cleared areas, rock circles, rock alignments, lithic scatters, fire altered rock, trails, and cairns. Historical sites include water diversion features, military trails, military roads, quarries, can scatters, glass scatters, cairns, and a railroad.

Of the archaeological sites within the APE, the SHPO concurred with MCAS Yuma's determination that 2 sites are eligible for listing in the NRHP and 18 sites are not eligible for listing in the NRHP (California Office of Historic Preservation 2014). The eligibility of the remaining 36 sites is undetermined.

3.5.3 Environmental Consequences

The regulations implementing Section 106 of the NHPA require that federal agencies take into account the effects (impacts) of their undertakings (proposed actions) on historic properties (cultural resources). The Marine Corps has determined that it is unable to fully assess the impacts of the Proposed Action on cultural resources prior to the finalization of this EA. In order to meet its responsibilities under Section 106 of the NHPA and in keeping with 36 CFR 800.14(b), the Marine Corps is preparing a PA that will

guide the continuation of the Section 106 process including evaluation and determination of NRHP eligibility for archaeological sites, and drafting of appropriate measures to avoid, minimize, and mitigate effects to historic properties from the Proposed Action. This agreement, being developed in consultation with the SHPO, Advisory Council on Historic Preservation (ACHP), and interested Federally Recognized Tribes, will ensure that historic properties are considered and treated in accordance with all applicable laws and regulations.

The PA will allow the Marine Corps and NSW to fulfill its mission while respecting historic properties and other cultural resources significant to the tribes. A copy of the signed PA will be added as an appendix to the Final EA (Appendix F; to be provided in the Final EA) and referenced in the FONSI, should the analyses result in the signing of a FONSI. Copies of correspondence with the SHPO, ACHP, and Federally Recognized Tribes are provided in Appendix A.

3.5.3.1 Alternative 1

Construction

All construction activities described in Section 2.3.1 have the potential to impact cultural resources as they all involve disturbance to ground surfaces. Analysis of the impacts to cultural resources from these activities cannot be done prior to the completion of Section 106 consultation, and will therefore be accomplished in accordance with stipulations in the PA.

Training

Certain training activities authorized by the ROD signed on October 26, 1998 would continue without further analysis. These activities include use of the static ranges for live-fire training; use of LFAMs for dismounted maneuvers and live-fire training; and activities such as periodic range maintenance and range clearance.

All other training activities described in Section 2.3.2 would be analyzed in accordance with stipulations in the PA.

3.5.3.2 Alternative 2

Construction

Proposed construction impacts under Alternative 2 would be the same as presented for Alternative 1.

Training

Impacts to cultural resources from range training and maintenance under Alternative 2 would be similar to impacts under Alternative 1 with the exception of additional off-road vehicle movement (mounted training) throughout SWATs 4 and 5, except for those areas identified in Section 2.2.

All mounted training activities described in Section 2.4 would be analyzed in accordance with stipulations in the PA.

3.5.3.3 No-Action Alternative

Under the No-Action Alternative, the proposed range reconfiguration would not occur and training would continue under current conditions. Existing conditions would remain as described in Section 3.5.2. Therefore, implementation of the No-Action Alternative would not have a significant impact to cultural resources.

3.6 PUBLIC HEALTH & SAFETY

3.6.1 Definition of Resource

For the purposes of this EA, public health and safety considers the risks of potential public exposure to military training and related potential hazards. Additional potential hazards may arise from unauthorized public access to the CMAGR. The ROI for public health and safety includes SWATs 4 and 5 and the surrounding vicinity.

3.6.2 Regulatory Setting

The Commanding Officer, MCAS Yuma is responsible for the operations and administration of the CMAGR. To minimize hazards to military personnel and the public, MCAS Yuma has developed and implemented various plans and programs, including Range and Training Area Standard Operating Procedures (i.e., StaO 3710.61), the Pre-mishap Plan (StaO 3750.2D), Restricted Areas and Military Operation Areas/Air Traffic Control Assigned Airspace (StatO 3710.6H Ch. 1). These plans and programs provide measures to contain ordnance, manage RTAs, discourage unauthorized entry into the installation, and other requirements.

Weapon danger zones and surface danger zones have been developed within the CMAGR to laterally and vertically contain projectiles, fragments, debris, and components resulting from the firing, launching, and/or detonation of ordnance to protect public health and safety.

3.6.3 Affected Environment

3.6.3.1 Airspace Safety

As the Niland and Bombay CFAs are uncharted, there is no requirement for nonparticipating aircraft to avoid the airspace, meaning that an aircraft cannot be prevented from flying through the airspace and disrupting training, even when a Notice to Airmen advising aviators of the scheduled use of the airspace has been properly filed. Types of nonparticipating aircraft can include civilian, commercial, and other military aircraft. During ground-based training, observers and firing range safety officers continuously monitor the Niland and Bombay CFAs to ensure that nonparticipating aircraft are not present during firing activity.

Whenever a designated spotter aircraft, radar, or ground lookout indicates the approach of a nonparticipating aircraft, current training activities must be halted. Although military training is halted when general aviation flights approach the existing CFAs, there remains risk to safety due to the low altitude flight paths used by general aviation aircraft. Per FAA JO 7400.2J, only those activities that can be immediately suspended on notice that a non-participating aircraft is approaching are appropriate for a CFA. Examples of such activity include ordnance disposal and blasting (FAA 2012); for example, explosives cannot be set on a timer for detonation; they must be command detonated (i.e., under direct control of a person). The USMC recently prepared an EA and associated FONSI (signed on June 26, 2014) to establish SUA within the CMAGR (R-2507W) to de-conflict civilian air traffic from vertical hazards associated with DoD airspace and training activities (NAVFAC SW 2014a). The USMC's SUA proposal is currently being reviewed by the FAA.

3.6.3.2 Ground Safety

SWAT 4 accommodates an extensive range of training activities, involving small arms, heavy weapons, pyrotechnics, and demolitions. An existing HHIA is located proximate to five existing dud-producing ranges in the southern portion of SWAT 4. The HHIA extends eastward, beyond the limits of SWAT 4, into adjacent land within the CMAGR.

SDZs have been designed in each range to achieve a 99.9999 percent level of containment. The Marine Corps employs and documents operational risk management at the training ranges to identify and assess hazards and implement controls for all phases of training events. The requirements for air and ground safety of all civilians and military personnel as well as the public at large are outlined in these documents (DoN 2010a).

3.6.3.3 Unexploded Ordnance

EOD personnel routinely perform sweeps for potential UXO to neutralize hazards from live-fire training exercises. Though periodic sweeps are performed on the range, UXO can be found throughout the RTAs. Given the military use of the CMAGR, which has occurred since 1942, unexploded bombs, rockets, cannon rounds, and other types of ordnance may be encountered anywhere. For example, ordnance may be lying on the ground, partially to fully buried and/or buried and migrated via surface runoff features. These munitions have the potential to explode, even though they may have lain in the desert for decades. EOD clearances conducted at the CMAGR have not demonstrated that any substantial migration of UXO has occurred, and no off range occurrences of UXO as a result of entrainment in sediment flows have been reported (USMC 2008b).

The MCAS Yuma REVA (USMC 2008b) screening level analysis concluded that average annual concentrations of all MC indicators in runoff would exceed the REVA trigger value at Siphon 10, at the boundary of SWAT 4. Surface water runoff and groundwater infiltration that contain MCs could serve as a pathway for human and ecological receptors. However, because surface water in the washes draining from the CMAGR is not used as a potable water source, as an irrigation water source, or for any contact activity, either on range or off range, no human or ecological receptors were identified. Because no complete exposure pathway was identified, the REVA concluded that there was no potential risk to human health or the environment. In addition, the toxicity thresholds for humans and other biological receptors are several orders of magnitude above the estimated MC concentrations reaching the range boundary (USMC 2008b). The USMC REVA program continues to monitor potential MC migration.

3.6.3.4 Unauthorized Entry

The CMAGR is closed to the public. No public roadways traverse the range, and signs restricting access are posted around the perimeter of the range. In accordance with the MCAS Yuma Range Regulations, visual reconnaissance must precede ordnance delivery activities in the area to ensure that no unauthorized persons are present. If unauthorized persons are observed, live-fire exercises are terminated until such a time that the unauthorized personnel are removed from the range. MCAS Yuma has conducted public outreach programs to raise awareness of the military training mission and the associated dangers and risks. To protect the general public from entry onto the CMAGR, a series of signs warning unauthorized personnel are posted along the perimeter of the CMAGR.

Unauthorized personnel are not allowed on the CMAGR at any time, but there are occasions where trespassers or “scrappers” access the CMAGR despite these patrols, the public outreach and education, and the warning signs. Scrappers are individuals who enter the CMAGR without authorization for the purpose of removing salvageable materials such as aluminum, brass, and copper. Scrappers have been

known to be armed and sometimes present a danger to anyone who approaches them. In addition, undocumented immigrants that cross the nearby international border may trespass onto the CMAGR. Standard procedure is to immediately notify Range Control with a complete description of the trespassers and their location.

3.6.4 Environmental Consequences

3.6.4.1 Alternative 1

Construction

Public health and safety impacts related to construction are primarily associated with the potential to encounter potential UXO. To minimize the risk of encountering UXO during construction, the project area proposed for construction would be swept for UXO by EOD personnel. If during construction activities any potential UXO is discovered, work would cease immediately and MCAS Yuma EOD personnel would be contacted. The existing HHIA would be used last for borrow material, and only if needed. Before excavating for borrow material within the existing HHIA, a UXO survey and surface-level clearance would occur within those areas of the existing HHIA that have been identified as potential borrow sources.

The Material Safety Data Sheet for the dust palliative states the material is not a hazardous waste, does not contain any components that are subject to the U.S. Toxic Substance Control Act, and does not contain 0.1 percent or more of any chemical listed as a carcinogen (Soilworks 2015b).

Training

Aircraft activities and ground-based activities with a substantial vertical element would continue to be conducted in accordance with current FAA regulations governing the use of SUA. Under Alternative 1, the USMC and NSW would continue to implement safety protocols (see Section 3.6.2). All of these instructions prescribe standard operating procedures when using weapons to ensure safe and proper use of training areas and to avoid possible conflict with other military units, government agencies, non-participating aircraft, or civilians.

In accordance with MCO 3570.1C, *Range Safety*, the DoD standard for weapons danger zones would continue to be designed to achieve a 99.9999 percent containment of the projectiles, fragments, debris, and components resulting from munitions blasts, limiting risk to civilians, military personnel, and other bystanders. All SDZs associated with the proposed reconfigured RTAs would be wholly contained within the CMAGR.

Increased training activities would increase the amount of UXO. Should any UXO be discovered in the course of training, EOD personnel would be contacted. MCAS Yuma would continue to conduct EOD sweeps on a quarterly basis to clear UXO to the extent safe and practicable. The potential for transport of UXO through surface water runoff would remain; however, the risk remains low as no off-range UXO has been documented (USMC 2008b).

The USMC would continue to monitor the environmental condition of the ranges under the DoD Range Sustainability and REVA Program. Increases in training levels would result in the increased of MCs, but those increases are not likely to elevate public health and safety concerns associated with chemical residues and MCs because surface water draining from the CMAGR is not used as a potable water source, as an irrigation water source, or for any contact activity, either on range or off range.

Unauthorized persons would continue to accidentally or knowingly trespass beyond the marked boundary of the range and potentially be exposed to hazardous military training activities. As part of Alternative 1, 800 ft (243 m) of fencing would be constructed parallel to the proposed Explosive Range along the CMAGR boundary to reduce the potential for trespassing in this area, and gates and signs would be erected in high-visibility areas to reduce the trespassing potential.

The proposed LFAM targets would either (1) be constructed with non-valuable materials (e.g., wood) or (2) would be immediately set up and then removed at the conclusion of each training exercise. Spent brass would be collected at the end of training at each static range and all materials potentially attractive to scrappers would be secured. Thus, there would be no associated increase in attractive materials for "scrappers."

The relevant AMMMs identified in Section 2.9 would be implemented and maintained to reduce potential impacts to public health and safety. Therefore, implementation of Alternative 1 would not have a significant impact to public health and safety.

3.6.4.2 Alternative 2

Construction

Proposed construction impacts under Alternative 2 would be the same as presented for Alternative 1.

Training

Under Alternative 2, the relative risk to public health and safety from military training activities would be similar as presented under Alternative 1 as there would be no increase in ordnance use. The increase in geographic scope of training under Alternative 2 result in an increased potential for interactions with trespassers; however, such incidences would continue to be handled in accordance with current protocols. The relevant AMMMs identified in Section 2.9 would be implemented and maintained to reduce potential impacts to public health and safety. Therefore, implementation of Alternative 2 would not have a significant impact to public health and safety.

3.6.4.3 No-Action Alternative

Under the No-Action Alternative, the existing SDZs would continue to achieve a 99.9999 percent level of munitions containment within the CMAGR. Though standard procedures would continue to be implemented to limit unauthorized entry and the risk to public health and safety, trespassing by unauthorized persons would likely continue to occur. Training would halt upon discovery of unauthorized persons in the training area. Therefore, implementation of the No-Action Alternative would not have a significant impact to public health and safety.

3.7 AIR QUALITY

3.7.1 Definition of Resource

Existing air quality at a given location can be described by the concentrations of specific pollutants in the atmosphere. The pollutants analyzed herein are known as "criteria pollutants" and have been determined by the USEPA to be of concern to the health and welfare of the general public. Criteria pollutants have national and/or state ambient air quality standards. Greenhouse gases (GHGs) emissions and global climate change are discussed in Section 5.2.

3.7.1.1 Criteria Pollutants

Volatile Organic Compounds (VOC) and Ozone (O_3)

The majority of ground-level O_3 (commonly known as "smog") is formed from the complex photochemical reactions in the atmosphere between VOCs, oxides of nitrogen (NO_x), and oxygen. VOCs and NO_x are considered precursors to the formation of O_3, a highly reactive gas that can damage lung tissue and affect respiratory function (USEPA 2014a).

Nitrogen Dioxide (NO_2)

NO_2 is a brownish, highly reactive gas produced primarily from the burning of fossil fuels. NO_2 can also lead to the formation of O_3 in the lower atmosphere (USEPA 2014a).

Carbon Monoxide (CO)

CO is a colorless, odorless, poisonous gas produced by the incomplete combustion of fossil fuels. Elevated levels of CO can result in harmful health effects, and can contribute to global climate change (USEPA 2014a).

Sulfur Dioxide (SO_2)

SO_2 is emitted primarily from the combustion of coal and oil by steel mills, pulp and paper mills, and from non-ferrous smelters. High concentrations of SO_2 can aggravate existing respiratory and cardiovascular diseases, and contribute to acid rain, which can, in turn, lead to the acidification of lakes and streams (USEPA 2014a).

Particulate Matter

Particulate matter less than 10 microns in diameter but greater than 2.5 microns in diameter is termed PM_{10}, and particulate matter less than or equal to 2.5 microns in diameter is termed $PM_{2.5}$. $PM_{2.5}$ is referred to as "fine particles," which are believed to pose significant health risks as they can lodge deeply into the lungs. Studies have linked increased exposure to $PM_{2.5}$ to respiratory and cardiovascular disease. Sources of fine particles include all types of combustion activities, such as motor vehicle engines, power plants, and wood burning (USEPA 2014a).

PM_{10} is typically comprised of dust, ash, soot, smoke, or liquid droplets emitted into the air. Fires, dust from paved or unpaved roads, construction activities, and natural sources (wind and volcanic eruptions) can contribute to increased PM_{10} concentrations (USEPA 2014a).

Criteria pollutant emissions affecting air quality in a given region can be characterized as being from either stationary or mobile sources, and can be point or non-point. Stationary sources are typically point sources, as the emissions are released from a single source (e.g., smokestack, pipe) in a fixed location. Non-point sources do not come from a single source. Mobile sources of emissions include emissions from vehicles and aircraft.

Air quality for a region is a function of the type and concentration of pollutants in the atmosphere, the size and topography of the air basin, and local and regional meteorological influences. The significance of a pollutant concentration in a region or geographical area is determined by comparing the concentrations to federal and/or state ambient air quality standards.

The USEPA has established National Ambient Air Quality Standards (NAAQS) for these pollutants. Areas that violate a federal air quality standard are designated as non-attainment areas. State ambient air quality standards for criteria pollutants have been set as well.

As shown in Table 3.7-1, the USEPA establishes the NAAQS, while the California Air Resources Board (CARB) establishes the state standards, termed the California Ambient Air Quality Standards (CAAQS). The NAAQS represent maximum acceptable concentrations that generally may not be exceeded more than once per year, except the annual standards, which may never be exceeded. The CAAQS represent maximum acceptable pollutant concentrations that are not to be equaled or exceeded. The CARB is responsible for enforcing both the federal and state air pollution standards.

Table 3.7-1. California and National Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards	National Standards[a]	
			Primary[b, c]	Secondary[b, d]
O_3	1-hour	0.09 ppm (180 µg/m^3)	—	Same as primary
	8-hour	0.070 ppm (137 µg/m^3)	0.075 ppm (147 µg/m^3)	Same as primary
CO	1-hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	—
	8-hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	—
NO_2	1-hour	0.18 ppm (339 µg/m^3)	0.10 ppm (188 µg/m^3)	—
	Annual	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)	Same as primary
SO_2	1-hour	0.25 ppm (655 µg/m^3)	0.075 ppm (105 µg/m^3)	—
	3-hour	—	—	0.5 ppm (1,300 µg/m^3)
PM_{10}	24-hour	50 µg/m^3	150 µg/m^3	Same as primary
	Annual	20 µg/m^3	—	Same as primary
$PM_{2.5}$	24-hour	—	35 µg/m^3	Same as primary
	Annual	12 µg/m^3	12 µg/m^3	15 µg/m^3
Lead	30-day average	1.5 µg/m^3	—	—
	Rolling 3-month average	—	0.15 µg/m^3	Same as primary
	Calendar Quarter	—	1.5 µg/m^3	Same as primary
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m^3)	No National Standards	
Vinyl Chloride	24-hour	0.01 ppm (26 µg/m^3)	No National Standards	
Visibility Reducing Particles	8-hour	In sufficient amount to produce an extinction coefficient of 0.23/km when the relative humidity is less than 70 percent. Measurement in accordance with CARB Method V.	No National Standards	

Notes: (a) Standards other than the 1-hour O_3, 24-hour PM_{10}, 24-hour $PM_{2.5}$, and those based on annual averages are not to be exceeded more than once a year.
(b) Concentrations are expressed first in units in which they were promulgated. Equivalent units given in parenthesis.
(c) Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health. Each state must attain the primary standards no later than 3 years after that state's implementation plan is approved by the USEPA.
(d) Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
mg/m^3 = milligrams per cubic meter; µg/m^3 = micrograms per cubic meter; ppm = parts per million.
Source: CARB 2014a.

3.7.2 Regulatory Setting

3.7.2.1 Federal Requirements

The CAA and its subsequent amendments established air quality regulations and allowed the USEPA to set the NAAQS. Section 176(c) of the CAA, as articulated in the USEPA General Conformity Rule (40 CFR 51.850-7 860 and 40 CFR 93.150-160), states that a federal agency cannot issue a permit or support an activity unless the agency determines that the action would conform to the most recent USEPA-approved State Implementation Plan (SIP). This means that projects using federal funds or requiring federal approval in nonattainment or maintenance areas must not: (1) cause or contribute to any new violation of a NAAQS; (2) increase the frequency or severity of any existing violation; or (3) delay the timely attainment of any standard, interim emission reduction, or other milestone. Certain actions are exempt from conformity determinations if the projected emission rates would be less than specified emission rate thresholds, known as *de minimis* thresholds. Actions would conform to a SIP if their annual direct and indirect emissions remain less than the applicable *de minimis* thresholds. Formal conformity determinations are required for any actions that exceed these thresholds. The CAA also established a national goal of preventing degradation or impairment in federally designated Class I areas. Class I areas are defined as those areas where any appreciable degradation in air quality or associated visibility impairment is considered significant. As part of the Prevention of Significant Deterioration (PSD) Program, Congress assigned mandatory Class I status to all national parks, national wilderness areas (excluding wilderness study areas or wild and scenic rivers), and memorial parks greater than 5,000 acres (2,023 hectares). In Class I areas, visibility impairment is defined as atmospheric discoloration (such as from an industrial smokestack), and a reduction in regional visual range. Visibility impairment or haze results from smoke, dust, moisture, and vapor suspended in the air. Very small particles either are formed from gases (sulfates, nitrates) or are emitted directly into the atmosphere from sources like electric utilities, industrial processes, and vehicle emissions. Stationary sources are regulated under the PSD Program, and the PSD permitting process requires a review of impacts to all Class I areas within 62 miles of any proposed major stationary source. Mobile sources, including aircraft and associated operations such as those occurring at DoN installations, are not subject to the requirements of PSD.

3.7.2.1 State and Local Requirements

The CARB is the state agency that has been delegated authority to enforce air pollution regulations and set guidelines to attain and maintain the NAAQS. In addition, the CARB establishes the state standards, termed the CAAQS. California is divided into 15 air basins, and the proposed project is within the Salton Sea Air Basin (SSAB). The CARB has delegated authority to the Imperial County Air Pollution Control District (ICAPCD) to administer air quality in the Imperial County portion of the SSAB, and has delegated authority to the South Coast Air Quality Management District (SCAQMD) to administer air quality in the Riverside County portion of the SSAB.

3.7.3 Affected Environment

3.7.3.1 Regional Climate

The CMAGR is located within the SSAB, which includes all of Imperial County and the southwest third of Riverside County. CMAGR has a desert climate, with low humidity, high summer temperatures, and moderate winter temperatures. Data from the Western Regional Climate Center (WRCC) are available for

Niland, California, which is located to the west of the CMAGR near the Salton Sea. August is the hottest month with an average maximum temperature of 110.4 °F (43.6 °C). January is the month with the lowest average maximum temperature of 67.9°F (19.9°C). Average precipitation measured at the Niland meteorological station is 2.61 inches per year (WRCC 2014).

3.7.3.2 Existing Air Quality

Attainment Status

The USEPA designates all areas of the U.S. as having air quality better than or worse than the NAAQS, termed as attainment and nonattainment, respectively. An area generally is in nonattainment for a pollutant if its NAAQS has been exceeded more than once per year. Former nonattainment areas that have attained the NAAQS are designated as maintenance areas. The Imperial County portion of the SSAB is classified as a moderate nonattainment area for the 8-hour O_3 NAAQS, and is a moderate nonattainment area for $PM_{2.5}$. The western two-thirds of Imperial County is also classified as a serious nonattainment area for PM_{10} (USEPA 2014b). The SSAB portion of Riverside County is classified as a severe nonattainment area for the 8-hour O_3 NAAQS, a moderate nonattainment area for $PM_{2.5}$, and a serious nonattainment area for PM_{10}. The CMAGR attains all other NAAQS. With regard to CAAQS, the CMAGR is a nonattainment area for O_3 and PM_{10}, and attains all other CAAQS.

The main pollutants of concern considered in this air quality analysis are VOCs, O_3, CO, NO_x, PM_{10}, and $PM_{2.5}$. Although VOCs or NO_x (other than nitrogen dioxide) have no established ambient air quality standards, they are important as precursors to O_3 formation. Due to the nonattainment designations, the *de minimis* thresholds shown in Table 3.7-2 apply to the proposed project area. If net annual emissions from a proposed action remain below the *de minimis* thresholds, or, a project can demonstrate conformity with the SIP, CA conformity determination is not required.

Table 3.7-2. *De Minimis* Thresholds for the Project Area

Criteria Pollutant	De Minimis Threshold (tons/year)
Imperial County	
PM_{10}	70
$PM_{2.5}$	100
NO_x	100
VOC	100
Riverside County	
PM_{10}	70
$PM_{2.5}$	100
NO_x	25
VOC	25

Source: USEPA 2014c.

For the purposes of this air quality analysis, and for air pollutants designated as nonattainment or maintenance with the NAAQS (and therefore subject to general conformity requirements), if the estimated total of direct and indirect emissions caused by a proposed action exceeds a conformity *de minimis* threshold requiring a conformity determination in the SSAB project region, further analysis would be conducted to determine whether impacts were significant. In such cases, when emissions conform to the approved SIP, then proposed impacts would be determined to be less than significant. For those air pollutants in SSAB that are in attainment of the NAAQS, the general conformity requirements and thresholds do not apply.

Local Monitoring Data

Representative air quality data for the region, as collected at the Niland and Brawley monitoring stations in Imperial County for the period 2011-2013, are shown in Table 3-7.3. Only O_3, PM_{10}, and $PM_{2.5}$ are measured at these monitoring stations. CO, NO_2, and SO_2 concentrations are not anticipated to be elevated due to the undeveloped nature of the range.

Table 3.7-3. Representative Air Quality Data for theProject Area (2011-2013)

Air Quality Indicator[1]	2011	2012	2013
O_3 *(2)*			
Peak 8-hour value (ppm)	0.074	0.076	0.083
Days above federal standard (0.075 ppm)	0	1	3
PM_{10} *(2)*			
Peak 24-hour value (μg/m^3)	220.3	212.6	143.7
Days above federal standard (150 μg/m^3)	1	2	0
$PM_{2.5}$ *(3)*			
Peak 24-hour value (μg/m^3)	37.0	25.9	23.1
Days above federal/state standard (35 μg/m^3)	1	0	0

Notes: μg/m^3 = micrograms per cubic meter; ppm = parts per million.
[1] CO, NO_x and SO_x are not measured at either the Niland or Brawley Stations.
[2] Data from the Niland (English Road) Monitoring Station.
[3] Data from the Brawley (220 Main Street) Monitoring Station.
Source: CARB 2014b.

Existing Emissions

As of 2012, emission sources at the CMAGR range included military aircraft operations, diesel powered generators, ordnance used during aircraft and ground vehicle training exercises, vehicle travel on unpaved roads, range maintenance activities, and wind-generated dust from both disturbed and undisturbed portions of the range. Estimated baseline emissions from existing training within SWATs 4 and 5 is presented in Table 3.7-4.

Table 3.7-4. Total Existing Training Emissions by County

	Air Pollutant Emissions (tons/year)					
	VOCs	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$
Imperial County:						
Maximum Baseline Annual Emissions	0.16	1.34	2.09	0.05	39.28	0.05
Riverside County:						
Maximum Baseline Annual Emissions	0.09	0.72	1.13	0.03	21.15	0.03

There are few permanent structures on the CMAGR other than those at Camp Billy Machen, which is located within SWAT 4. Per ICAPCD Rule 800 the CMAGR is granted an exemption for military range training, range clearance, and target maintenance activities with regard to generation of particulate matter. Activities within Camp Billy Machen and any road maintenance must follow Rule 800 (DoN 2013).

3.7.4 Environmental Consequences

3.7.4.1 Methodology

Construction

Air quality impacts from construction activities would occur from combustive emissions due to the use of fossil fuel-powered equipment and fugitive dust emissions due to the operation of equipment on exposed soil. Construction emissions were estimated using the California Emissions Estimator Model (CalEEMod) to model the air emissions from grading and soil movement/transfer, using the Road Construction Model to calculate emissions from roadway construction, and using data from CARB's EMFAC model to calculate the emissions from the concrete batching process. All of the construction emissions would be generated within Imperial County. Appendix G contains detailed emissions estimates.

Training

Default and project-specific information (when available) was used within the CalEEMod to assess potential impacts to air quality associated with ground vehicle, air operations, and ordnance use during training events. For purposes of estimating emissions within each county (Riverside and Imperial counties), this analysis assumes that 65 percent of emissions would occur within Imperial County, and 35 percent would occur within Riverside County. These percentages reflect the approximate geographic distribution of current and future training activities. Appendix G contains detailed emissions estimates.

3.7.4.2 Evaluation Criteria

The total air emissions generated by proposed construction were based upon the construction specifics presented in Section 2.3. The construction emissions were not compared to the baseline emissions, as they would be in addition to the baseline. Therefore, the total construction emissions were evaluated for the purposes of demonstrating CAA conformity.

The projected emissions resulting from the training phase were compared with the no-action emissions (baseline emissions), and the net change was evaluated for the purposes of demonstrating CAA conformity. If the estimated total increase in direct and indirect emissions caused by a project alternative exceed a conformity *de minimis* threshold in the SSAB project region (see Table 3.7-2), further analysis and a conformity determination would be required to determine whether impacts were significant. In such cases, if the proponent can be demonstrated through consultation with the ICAPCD and South Coast Air Pollution Control that the proposed emissions would conform to the approved SIP, air quality impacts would be considered less than significant. For those air pollutants in SSAB which are in attainment of the NAAQS (CO, SO_2, and $PM_{2.5}$), the general conformity requirements and thresholds do not apply.

3.7.4.3 Alternative 1

Construction

Under Alternative 1, each of the three construction phases would last a total of 24 months and include grading activities. Construction material would be transported from on-site borrow areas to the construction sites. During construction, the major and minor access roads would be initially be treated with a dust palliative to reduce the amount of $PM_{2.5}$ and PM_{10} generated from ground vehicle traffic. A modest application would create a light surface crust that remains water permeable for air and water, yet ideal for controlling dust and suppressing particulate matter to reduce air quality and visibility impacts.

Table 3.7-5 summarizes the annual emissions that would occur from construction activities proposed under Alternative 1, for each of the two construction years. The data in Table 3.7-5 show that estimated total annual emissions from proposed construction activities would not exceed conformity *de minimis* thresholds.

Table 3.7-5. Estimated Total Annual Construction Emissions Resulting from Implementation of Alternative 1

Activity and Location	Air Pollutant Emissions (tons)					
	VOCs	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$
Imperial County:						
Construction Emissions	**2.09**	**11.89**	**18.23**	**0.01**	**58.71**	**40.57**
Conformity *de minimis* thresholds:	100	NA	100	NA	70	100
Exceeds Conformity *de minimis* threshold?	**No**	**NA**	**No**	**NA**	**No**	**No**

Note: NA = not applicable because the SSAB is currently in attainment of the NAAQS for these criteria pollutants.

Training

Table 3.7-6 presents an estimate of the annual training emissions from all activities that would occur with implementation of Alternative 1 within Imperial and Riverside counties. Under Alternative 1, the fugitive dust (PM_{10}) emissions estimated to be created from ground vehicles was based on the types and mileage of vehicles identified by the NSW and USMC for use during training activities. To calculate fugitive dust emissions from unpaved roads, an average silt content for the unpaved roads of 8.5 percent was used, and 50 percent of ground vehicle miles traveled were assumed to be on major access roads treated with the dust palliative; for modeling purposes the application of the dust palliative was assumed to have an estimated 70 percent control efficiency. Dust palliatives are not currently used. Although there would be an increase in training under Alternative 1, there would be a decrease in fugitive dust emissions compared to existing conditions due to the periodic application of a dust palliative, which would help control fugitive dust emissions from the major roads. The presented estimated fugitive dust emissions include estimated emissions from helicopter/tilt-rotor landings and takeoffs on a combination of paved and unpaved landing surfaces throughout the SWAT areas.

Table 3.7-6. Total Annual Training Emissions Resulting from Implementation of Alternative 1

Activity and Location	Air Pollutant Emissions (tons/year)					
	VOCs	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$
Imperial County:						
Baseline (No-Action Alternative) Emissions	0.16	1.34	2.09	0.05	39.28	0.05
Alternative 1 Annual Training Emissions	0.53	3.47	7.75	0.09	37.33	0.24
Net Change in Emissions	**0.37**	**2.13**	**5.66**	**0.04**	**-1.95**	**0.19**
Conformity *de minimis* thresholds:	100	NA	100	NA	70	100
Exceeds Conformity *de minimis* threshold?	**No**	**NA**	**No**	**NA**	**No**	**No**
Riverside County:						
Baseline (No-Action Alternative) Emissions	0.09	0.72	1.13	0.03	21.15	0.03
Alternative 1 Annual Training Emissions	0.29	1.87	4.17	0.05	20.10	0.13
Net Change in Emissions	**0.20**	**1.15**	**3.04**	**0.02**	**-1.05**	**0.10**
Conformity *de minimis* thresholds:	25	NA	25	NA	70	100
Exceeds Conformity *de minimis* threshold?	**No**	**NA**	**No**	**NA**	**No**	**No**

Notes: NA = not applicable because the SSAB is currently in attainment of the NAAQS for these criteria pollutants.
[1] Military training emissions are already accounted for in the SIP.

The data in Table 3.7-6 show that annual net increase in emissions from the proposed training activities would not exceed conformity *de minimis* thresholds. For the first two years of the project, construction and training emissions would occur simultaneously. The combined emissions from the construction and training phases are shown in Table 3.7-7.

Table 3.7-7. Total Annual Emissions Resulting from Implementation of Alternative 1 During Construction and Training (Years 1 and 2)

Activity and Location	Air Pollutant Emissions (tons/year)					
	VOCs	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$
Imperial County:						
Annual Construction Emissions	2.09	11.89	18.23	0.01	58.71	40.57
Annual Training Emissions (net change)	0.37	2.13	5.66	0.04	-1.95	0.19
Total	**2.46**	**14.02**	**23.89**	**0.05**	**56.76**	**40.76**
Conformity *de minimis* thresholds:	100	NA	100	NA	70	100
Exceeds Conformity *de minimis* threshold?	**No**	**NA**	**No**	**NA**	**No**	**No**
Riverside County:						
Annual Construction Emissions	0	0	0	0	0	0
Annual Training Emissions (net change)	0.20	1.15	3.04	0.02	-1.05	0.10
Total	**0.20**	**1.15**	**3.04**	**0.02**	**-1.05**	**0.10**
Conformity *de minimis* thresholds:	25	NA	25	NA	70	100
Exceeds Conformity *de minimis* threshold?	**No**	**NA**	**No**	**NA**	**No**	**No**

Notes: NA = not applicable because the SSAB is currently in attainment of the NAAQS for these criteria pollutants.

As shown in Table 3.7-7, the *de minimis* levels for either county would not be exceeded during the first two years of the proposed project, when construction and training activities are occurring simultaneously. With regard to PM_{10} specifically, the potential daily emissions in Imperial County during the first two years of Alternative 1 would be 0.24 tons per day, assuming 240 training days per year, and would decrease substantially after the construction is complete because training would at that point be the only source of emissions. The 2009 Imperial County SIP assumes 32 tons per day of PM_{10} generated from military lands within Imperial County (ICAPCD 2009), approximately two orders of magnitude greater than the potential emissions from the proposed project during both construction and training activities. Potential increases of attainment pollutants under Alternative 1 would also still be below PSD thresholds of 250 tons/year for criteria pollutants under the CAA. Therefore, for these reasons, implementation of Alternative 1 would not have a significant impact to air quality. A Record of Non-Applicability for CAA conformity has been prepared and is provided in Appendix H.

3.7.4.4 Alternative 2

Construction emissions for Alternative 2 would be the same as presented for Alternative 1 (see Table 3.7-5). The same number and types of tactical vehicles and training equipment proposed for use under Alternative 1 would also be used under Alternative 2. However, under Alternative 2, there would be more vehicle travel on unpaved roads; however the total number of miles traveled and vehicle types would be the same as Alternative 1. For these reasons, the construction and training emissions resulting from Alternative 2 within the project area would be similar to the emissions presented for Alternative 1, as shown in Table 3.7-8. Fugitive dust emissions (PM_{10}) under Alternative 2 would be greater than under Alternative 1 due to more off-road travel. The off-road travel areas would not receive the dust palliative treatments. However, implementation of Alternative 2 would still not exceed *de minimis* levels for either county.

Table 3.7-8. Total Annual Training Emissions Resulting from Implementation of Alternative 2

Activity and Location	Air Pollutant Emissions (tons/year)					
	VOCs	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$
Imperial County:						
Baseline (No-Action Alternative) Emissions	0.16	1.34	2.09	0.05	39.28	0.05
Alternative 2 Annual Training Emissions	0.53	3.47	7.75	0.09	42.13	0.24
Net Change in Emissions	0.37	2.13	5.66	0.04	2.85	0.19
Conformity *de minimis* thresholds:	100	NA	100	NA	70	100
Exceeds Conformity *de minimis* threshold?	**No**	**NA**	**No**	**NA**	**No**	**No**
Riverside County:						
Baseline (No-Action Alternative) Emissions	0.09	0.72	1.13	0.03	21.15	0.03
Alternative 2 Annual Training Emissions	0.29	1.87	4.17	0.05	22.69	0.13
Net Change in Emissions	0.2	1.15	3.04	0.02	1.54	0.1
Conformity *de minimis* thresholds:	25	NA	25	NA	70	100
Exceeds Conformity *de minimis* threshold?	**No**	**NA**	**No**	**NA**	**No**	**No**

Notes: NA = not applicable because the SSAB is currently in attainment of the NAAQS for these criteria pollutants.

For the first two years of the project, construction and training emissions would occur simultaneously. The combined emissions from the construction and training phases are shown in Table 3.7-9.

As shown in Table 3.7-9, the *de minimis* levels for either county would not be exceeded during the first two years of Alternative 2, when construction and training activities are occurring simultaneously. With regard to PM_{10} specifically, the potential daily emissions in Imperial County during the first two years of the proposed project would be 0.26 tons per day, assuming 240 training days per year, and would decrease substantially after the construction is complete because training would at that point be the only source of emissions. The 2009 Imperial County SIP assumes 32 tons per day of PM_{10} generated from military lands within Imperial County (ICAPCD 2009), approximately two orders of magnitude greater than the potential emissions from the proposed project during both construction and training activities.

Table 3.7-9. Total Annual Emissions Resulting from Implementation of Alternative 2 During Construction and Training (Years 1 and 2)

Activity and Location	Air Pollutant Emissions (tons/year)					
	VOCs	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$
Imperial County:						
Annual Construction Emissions	2.09	11.89	18.23	0.01	58.71	40.57
Annual Training Emissions (net change)	0.37	2.13	5.66	0.04	2.85	0.19
Total	**2.46**	**14.02**	**23.89**	**0.05**	**61.56**	**40.76**
Conformity *de minimis* thresholds:	100	NA	100	NA	70	100
Exceeds Conformity *de minimis* threshold?	**No**	**NA**	**No**	**NA**	**No**	**No**
Riverside County:						
Annual Construction Emissions	0	0	0	0	0	0
Annual Training Emissions (net change)	0.20	1.15	3.04	0.02	1.54	0.10
Total	**0.20**	**1.15**	**3.04**	**0.02**	**1.54**	**0.10**
Conformity *de minimis* thresholds:	25	NA	25	NA	70	100
Exceeds Conformity *de minimis* threshold?	**No**	**NA**	**No**	**NA**	**No**	**No**

Notes: NA = not applicable because the SSAB is currently in attainment of the NAAQS for these criteria pollutants.

Potential increases of attainment pollutants under Alternative 2 would also still be below PSD thresholds of 250 tons/year for criteria pollutants under the CAA. Therefore, implementation of Alternative 2 would not have a significant impact to air quality.

3.7.4.5 No-Action Alternative

Under the No-Action Alternative, training activities as described in Section 2.5 would continue to occur. On-going air and ground training activities would continue at existing levels and areas within SWATs 4 and 5. Air emissions that would continue to result from the No-Action Alternative (i.e., the existing conditions) have been estimated and are shown in Table 3.7-4. The daily allowance for fugitive dust on military lands in Imperial County (as described in Section 3.7.4.4) apply to the baseline conditions as described by the No-Action Alternative. Therefore, implementation of the No-Action Alternative would not have a significant impact to air quality.

3.8 NOISE

3.8.1 Definition of Resource

Noise is generally defined as loud, unpleasant, unexpected, or undesired sound that is typically associated with human activity and that interferes with or disrupts normal activities. Although prolonged exposure to high noise levels has been demonstrated to cause hearing loss, the principal human response to environmental noise is annoyance. The response of individuals to similar noise events is diverse and influenced by the type of noise, the perceived importance of the noise and its appropriateness in the setting, the time of day and the type of activity during which the noise occurs, and the sensitivity of the individual.

Sound is generally characterized by several variables, including frequency and intensity. Frequency describes the pitch of the sound measured in hertz (Hz), while intensity describes the sound's loudness measured in decibels (dB). Decibels are measured using a logarithmic scale[4]. A sound level of zero dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Generally, sound levels in the range of approximately 110 to 120 dB can be felt inside the human ear as discomfort, levels between 130 to 140 dB are felt as pain, and levels above this range risk ear tissue damage (Berglund and Lindvall 1995). Table 3.8-1 provides an example of the dB levels associated with various common outdoor and indoor activities to provide a frame of reference. The minimum change in the sound level of individual events that an average human ear can detect is about 1 to 2 dB. A 3- to 5-dB change is readily perceived. A change in sound level of about 10 dB is usually perceived by the average person as a doubling (or if decreasing by 10 dB, halving) of the loudness.

[4] A scale of measurement that displays the value of a quantity in terms of orders of magnitude.

Table 3.8-1. Noise Levels Associated with Common Outdoor and Indoor Activities

Noise Level (dB)	Common Outdoor Activities	Common Indoor Activities
110 - 100	Jet Fly-over at 1,000 ft (300 m)	Rock Band
100 - 90	Gas Lawn Mower at 3 ft (1 m)	-
90 - 80	Diesel Truck at 50 ft (1.5 m), moving at 50 miles/hour (80 km/hour)	Food Blender at 3 ft (1 m)
70	Commercial Area, Gas Lawn Mower at 100 ft (30 m)	Vacuum Cleaner at 10 ft (3 m)
60	Heavy Traffic at 300 ft (90 m)	Normal Speech at 3 ft (1 m)
50 - 40	Quiet Urban Daytime	Large Business Office
40 - 30	Quiet Urban/Suburban Nighttime	Theater, Large Conference Room (Background)
30 – 20	Quiet Rural Nighttime	Library, Bedroom at Night, Concert Call (Background)
20 – 10	-	Broadcast/Recording Studio
0	Lowest Threshold of Human Hearing	-

Source: Caltrans 2009.

Environmental noise measurements are usually characterized by an "A-weighted" scale that filters out very low and very high frequencies to replicate human sensitivity. An "A" is commonly added to the measurement unit to identify that the measurement has been made with this filtering process (dBA). A "C-weighted" scale is typically applied to impulsive sounds such as an ordnance detonation or a sonic boom, and is denoted by the unit "dBC."

In California, Community Noise Equivalent Levels (CNEL) are typically used for the evaluation of community noise effects (i.e., long-term annoyance and compatible land uses). CNEL is a composite metric that accounts for all noise events over a 24-hour period.

3.8.2 Regulatory Setting

Table 3.8-2 presents an overview of the 24-hour and single-event noise metrics, the models from which they are derived, and their scope of applicability in evaluating the potential for noise effects. The 24-hour metrics such as CNEL are used to evaluate land use compatibility while the single-event metrics provide supplemental information and a basis for analyzing aircraft noise comparisons and the potential for generating noise complaints.

The Noise Zones mentioned in Table 3.8-2 are from the DoN's Air Installation Compatible Use Zone (AICUZ) and Range AICUZ instructions and are primarily used for evaluating the noise exposure associated with a specific action. For airfields and airspace, Noise Zones have an upper bound of 64 dBA CNEL for Noise Zone I, incrementing 10 dBA for each zone up to Noise Zone III for CNEL greater than or equal to 75 dBA (DoN 2008a, 2008b).

The DoN Range AICUZ Instruction is expressed in terms of A-weighted noise levels. To compare blast noise in terms of C-weighted noise levels to A-weighted noise levels, the criterion level is adjusted on the principle of equal annoyance. The 62 and 70 dBC CNEL correspond to the 65 and 75 dBA CNEL criterion, respectively (DoN 2008b; Wyle 2003). Therefore, ordnance noise levels below 62, 62 to 70, and above 70 dBC CNEL correspond to Noise Zones I, II, and III, respectively. As shown in Table 1 of the AICUZ Program (DoN 2008a), residential land uses are considered compatible with Noise Zone I listed in Table 3.8-2 (i.e., below 65 dBA or 62 dBC).

Table 3.8-2. Summary of Applicable Noise Metrics

Noise Source	Applicable Noise Model	24-hour Noise Metrics			Single-Event Noise Metrics (decibel)		
		Noise (decibel)	Events	DoD Land Use Compatibility Guideline	Sound Exposure Level	Maximum Sound Level	PK 15 (met)
Aircraft (airspace)	Military Operating Area and Range Noise Model (MR_NMAP)	CNEL (A-weighted)	Average Daily Events during the Busiest Month	64 dBA = Noise Zone I 65 - 74 dBA = Noise Zone II 75+ dBA = Noise Zone III	A-weighted and Rise-time Corrected	A-weighted	NA
Blast/ Ordnance	Blast Noise Prediction (BNOISE2)	CNEL (C-weighted)	Annual Average Daily Events	61 dBC = Noise Zone I 62 - 69 dBC = Noise Zone II 70+ dBC = Noise Zone III	C-weighted	Unweighted (L_{pk})	
Noise Effect Applicability:		Land Use Compatibility			Comparing events from differing aircraft types (e.g., helicopter vs. fixed-wing)		Potential for Noise Complaints

Notes: Lpk = Peak Sound Pressure Level; PK 15 (met) = Peak Sound Pressure Level exceeded by 15 percent of ordnance/blast events based on variable meteorological conditions.
NA = not applicable.

3.8.3 Affected Environment

3.8.3.1 Baseline Noise Environment

The noise analysis presented in the F-35B West Coast Basing Final EIS (DoN 2010b) is the most current assessment of noise from military training and as such represents the baseline military noise contribution to the ambient noise environment within the project area (DoN 2013).

The affected environment for noise includes the project area and 19 existing noise-sensitive areas, which are located to the west of the project area (Figure 3.8-1). These include small clusters of residences adjacent to the western part of SWAT 4 and individual dwellings that are dispersed within agricultural areas lying to the west of SWAT 4. There is also a Health Spa located at the end of Hot Mineral Springs Road near one of the cluster of homes. These are the closest noise-sensitive areas to the project area at SWATs 4 and 5. Located 3.3 miles to the south of SWAT 4, Niland is the closest community to the range with an Elementary School and Houses of Worship. An Informal Community is located adjacent to the southern tip of SWAT 4. Joshua Tree National Park is the closest national park, but is located more than 15 miles north of the nearest extent of the CMAGR. Figure 3.8-1 also depicts the location of the noise contours of military training (i.e., aviation operations and ordnance delivery) relative to the noise-sensitive areas.

Modeled baseline aviation noise levels at noise-sensitive areas range from less than 35 dBA to a maximum of 49.9 dBA (NAVFAC SW 2014a). As shown in Table 3.8-1, these noise levels correlate to quiet urban/suburban nighttime noise levels (i.e., aircraft noise less than 35 dBA) and quiet urban daytime noise levels (49.9 dBA). Over the past 10 years, the USMC has received two noise complaints in the vicinity of CMAGR. One complaint came from Niland and the other from a community located northwest of Camp Billy Machen along the Bradshaw Trail (NAVFAC SW 2014b).

Ground-based training involving small arms, heavy weapons, and demolitions has been occurring in and around the project area since 1966. As shown in Table 2-8, exercises in SWAT 4 currently involve the annual expenditure of more than 38,000 pyrotechnics, 5 million small arms rounds (i.e., 5.56 mm, 7.62 mm, 9 mm, and .50 caliber), 26,000 heavy weapons rounds (launched grenades, mortars, recoilless rifles, and anti-armor rockets), and 55,000 demolitions (including 72, 50-pound demolition and shaped charges). Night training exercises comprise 42 percent of the annual training events at SWAT 4, and personnel use a variety of ground vehicles on existing roads either as part of the training exercise and/or to access RTAs.

As shown on Figure 3.8-1, the 62 dBC CNEL contours from ordnance use do not extend beyond CMAGR boundaries and hence do not expose off-range persons or housing units to noise levels greater than 62 dBC.

3.8.4 Environmental Consequences

Exterior noise levels up to 64 dBA CNEL are considered compatible with potentially noise sensitive receivers or land uses such as residences, transient lodging, classrooms, and medical facilities; therefore, this threshold serves as a guidance indicator of potential noise impacts.

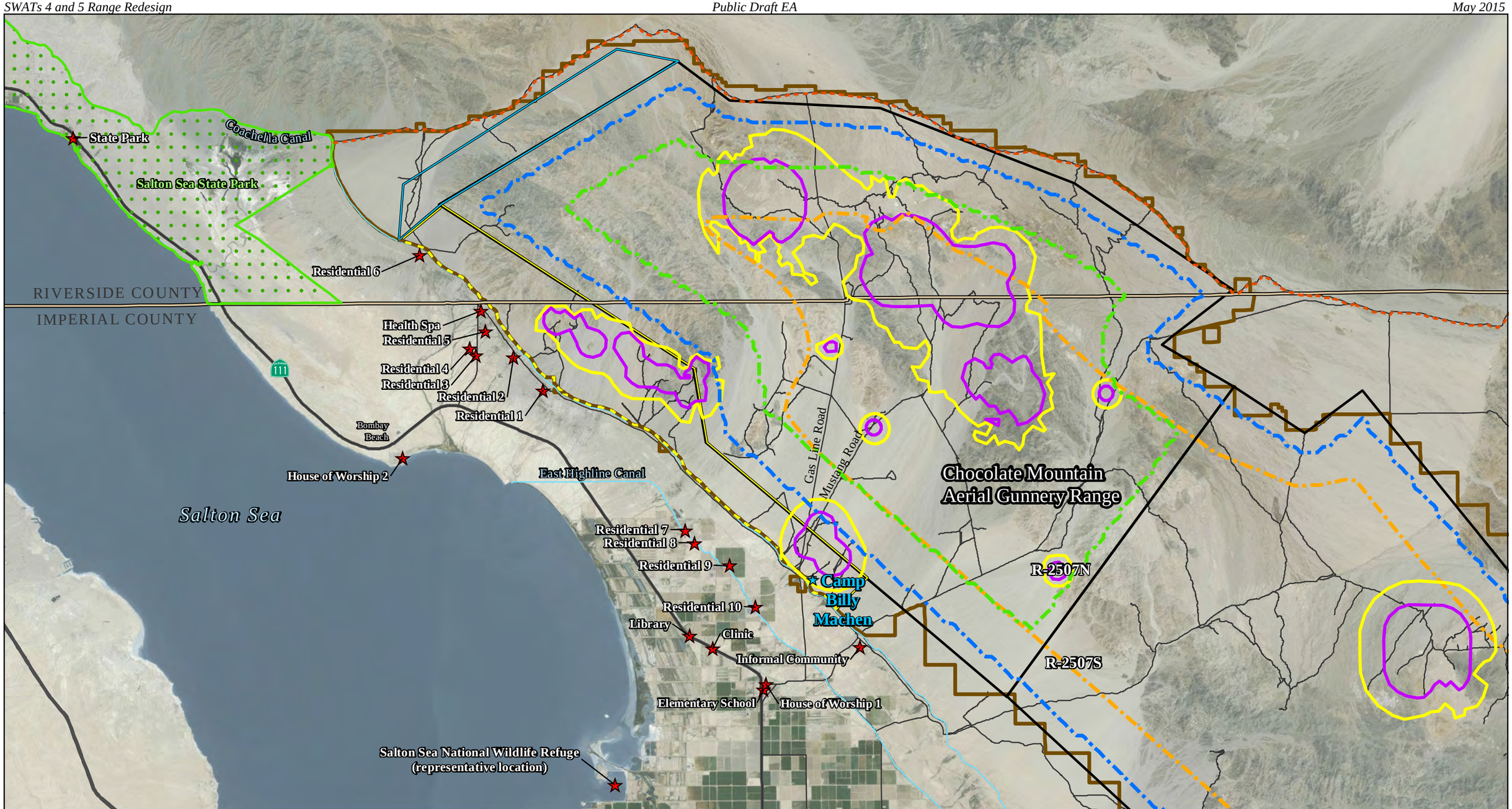
For the purpose of this EA, a significant noise impact would occur if noise levels associated with small arms and ordnance use would exceed the noise exposure level established for Noise Zone I, as defined in the AICUZ Program (DoN 2008a). This noise level would be incompatible with residential land uses. Potential ordnance noise impacts were evaluated qualitatively based on a review of previous modeling completed for other ranges that use similar weapons.

3.8.4.1 Alternative 1

<u>Construction</u>

The use of heavy equipment for range redesign and construction activities would occur entirely within the limits of SWAT 4. The nearest noise-sensitive area to any range construction activity is Residential 7, which is located approximately 9,700 ft (2,956 m) to the south and west of the proposed 600 meter known distance range. Based on maximum noise levels estimated for specific types of construction machinery by the Federal Highway Administration (2006), use of a bulldozer or excavator could result in a noise level of 85 dBA at a distance of 50 ft (15 m). Based on the noise attenuation with distance formula (i.e., sound decreases by 6 dBA with each doubling of distance) construction noise at Residential 7 would be approximately 39 dBA, which correlates to a quiet urban/suburban nighttime noise environment.

Soil and concrete haul trips would occur exclusively within the boundaries of SWAT 4. Construction worker trips would travel on existing roads as they approach the installation, and as a result would pass near noise-sensitive areas along their route. However, the number of construction worker trips is expected to be relatively minor, and therefore traffic noise levels are not expected to be substantial. Project construction would be short-term, localized and for the most part a substantial distance from noise-sensitive areas.



Legend

- Existing R-2507N/S
- SWAT 5
- SWAT 4
- CMAGR Boundary
- County Boundary
- Canal
- Highway
- Road
- Bradshaw Trail
- SWAT 4 and CMAGR Shared Boundary
- Salton Sea State Park
- Noise-Sensitive Area

Baseline Aviation Noise Contours
- 55 dBA
- 60 dBA
- 65 dBA

Baseline Ordnance Noise Contours
- 62 dBC
- 70 dBC

Figure 3.8-1
Baseline Aviation and Ordnance Noise Contours

0 2 4 Miles
0 2 4 Kilometers

Source: MCAS Yuma 2012, 2015; Navy 2013, 2014

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Training

Ordnance

Under Alternative 1, SWATs 4 and 5 ranges would be reconfigured and small arms and heavy weapons currently used on CMAGR would increase to levels described in Table 2-5. Small arms training would occur at various locations in the project area. The loudest weapon in the class of small arms is the .50 caliber machine gun, which would be used on the multi-purpose machine gun range. The nearest noise-sensitive area to the proposed machine gun range (i.e., Residential 7) is located on Wilkins Road near the East Highline Canal, 2.3 miles (3.7 km) southwest of the range. Machine gun fire would be audible at this receptor; however, incompatible noise from the range would extend approximately one mile (1.6 km) from the firing line (DoN 2010c). Therefore, because Residential 7 is located more than one mile (1.6 km) from the machine gun range, the estimated noise levels would be compatible with the existing land use at Residential 7. Other static ranges would use smaller caliber weapons and would be approximately the same distance away from noise-sensitive areas. Therefore, no noise-based land use incompatibilities would result.

The proposed LFAM Range S-4-20 would be closer to noise-sensitive areas than any of the other ranges (i.e., 2,000 ft (610 m) from Residential 2). Depending on the ultimate tempo, timing, and type of training in S-4-20, peak noise levels could exceed compatibility levels, which normally extend out 3,000 ft (910 m) for peak noise levels but only 1,500 ft (457 m) for A-weighted CNEL contours. However, the noise would be consistent with existing LFAM training in SWAT 4. All other small arms usage would be at other LFAM ranges that would be located further away from the noise-sensitive areas.

The Explosives Range is anticipated to be the loudest generator of C-weighted lower frequency noise. This range would be located approximately 2 miles (3.2 km) from the nearest residence located on Wilkins Road (i.e., Residential 9). Noise contours are expected to extend such that the residence would be exposed to Noise Zone I levels, which would be compatible with residential areas. A comparative net explosive weight of 40 pounds was used to make this conclusion and the additional 10 pounds proposed under the Proposed Action would result in a slightly louder demolition (DoN 2010c); however, noise levels are expected to remain within Noise Zone I levels. Because this is a low frequency explosive noise, no mitigation to reduce noise is possible. However, the potential impact would be minimized through the implementation of the AMMM presented in Section 2.9.

The firing lines for mortars, rockets, recoilless rifles, and missiles would be located on the eastern boundary of SWAT 4, with the target area located in the interior of the CMAGR. Given the location of the firing lines, the distance to the nearest noise-sensitive area would be sufficiently far to attenuate noise to compatible levels. Hand and rocket-propelled grenades typically create noise levels extending one mile from the source (DoN 2010c). These ranges would be located within the interior portion of SWAT 4, and are well over one mile from any noise-sensitive area.

Aircraft

Alternative 1 would result in an increase in flight hours for fixed-wing, rotary-wing, tilt-rotor, and UAS aircraft over SWATs 4 and 5. The noise impact caused by this increase was estimated using industry standard noise modeling software and methods, and the inputs, assumptions, and conclusions of the noise analysis are documented in a noise technical report, which was prepared for the EA for the Proposed Establishment of SUA Restricted Area R-2507W (the R-2507W EA) (NAVFAC SW 2014a).

As shown in Table 5-2 of the R-2507W EA (NAVFAC SW 2014a), Alternative 1 would increase noise levels by 1.5 dBA or more at four noise-sensitive areas (i.e., Health Spa [1.8 dBA], Residential 1 [2.1

dBA], Residential 2 [1.8 dBA], and Residential 6 [1.6 dBA]). However, the noise exposure level at noise-sensitive areas would be less than 50 dBA at all locations. Therefore, implementation of Alternative 1 would not have a significant impact to the noise environment.

3.8.4.2 Alternative 2

Construction

Proposed construction impacts under Alternative 2 would be the same as presented for Alternative 1.

Training

Aircraft

Proposed aircraft training impacts under Alternative 2 would be the same as presented for Alternative 1.

Small Arms and Ordnance

Noise levels under Alternative 2 would be similar to Alternative 1, except the mounted LFAM activities would be allowed throughout SWATs 4 and 5, instead of being contained within designated LFAM ranges. Overall, noise generating activities under Alternative 2 would involve the same number of rounds and the same number of vehicles as Alternative 1, but they would be spread out over a larger area. Therefore, the average noise levels these activities would not be confined to the defined LFAM areas and as such, could result in noise sources (vehicle noise and small arms firing) being closer to noise-sensitive areas. However, the increase in noise from training activities is not anticipated to exceed Noise Zone I levels due to the distance between noise-sensitive areas and training areas. The relevant AMMM identified in Section 2.9 would be implemented and maintained to reduce potential impacts from noise during training. Therefore, implementation of Alternative 2 would not have a significant impact to the noise environment.

3.8.4.3 No-Action Alternative

Under this alternative, existing training activities and locations would remain unchanged. Noise contours associated with training exercises (including aircraft, small arms fire, and ordnance use) would be as shown on Figure 3.8-1, and there would be no net increase in noise, as compared to baseline conditions. Therefore, implementation of the No-Action Alternative would not have a significant impact to the noise environment.

CHAPTER 4
CUMULATIVE IMPACTS

4.1 REGULATORY SETTING

Cumulative impacts are those that result from "the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions" (40 CFR § 1508.7 of the CEQ Regulations). Cumulative impacts can also result from individually minor but collectively significant actions taking place over a period of time.

Cumulative impacts may occur when there is a relationship between a Proposed Action and other actions expected to occur in a similar location. This relationship may or may not be obvious. Actions overlapping, or in close proximity to, a Proposed Action can have more potential for cumulative impacts on "shared resources" than actions that may be geographically separated. Similarly, actions that coincide temporally would tend to offer a higher potential for cumulative impacts.

4.2 AFFECTED ENVIRONMENT

Information on past, present, and reasonably foreseeable future projects and their associated anticipated impacts was gathered through a review of available environmental documentation (conducted in July 2014) and in coordination with the USMC and U.S. Navy.

4.2.1 Geographic Scope of the Cumulative Effects Analysis

For this analysis, a geographic scope, or ROI, was established for each resource area. The ROI is generally based on the natural boundaries of the resource affected, rather than jurisdictional boundaries. The geographic scope may be different for each resource area. The geographic scope of cumulative effects often extends beyond the scope of the direct effects, but not beyond the scope of the direct and indirect effects of the proposed project and alternatives. However, if the proposed project and alternatives are determined to have no direct or indirect effects on a resource, no further cumulative effects analysis is necessary. ROIs are defined in Section 4.3.2 for each resource listed below. Because ROIs vary for different resources, not all of the projects listed in Table 4-1 would be located within the ROIs defined for a particular resource.

4.2.2 Time Frame of the Cumulative Effects Analysis

A time frame for each issue related to cumulative effects has been determined. The time frame is defined as the long-term and short-term duration of the effects anticipated. Long-term can be as long as the longest lasting effect. Time frames, like geographic scope, can vary by resource. Each project in a region has its own implementation schedule, which may or may not coincide or overlap with the schedule for implementing the Proposed Action. This is a consideration for short-term impacts from the Proposed Action. However, to be conservative, the cumulative analysis assumes that all projects in the cumulative scenario are built and operating during the timeframe associated with the Proposed Action.

Past actions are projects that have been approved and/or permitted, and that have either very recently completed construction/implementation or have yet to complete construction/been implemented. Present

actions are actions that are ongoing at the time of the analysis. Reasonably foreseeable future actions are those for which there are existing decisions, funding, or formal proposals, or which are highly probable based on known opportunities or trends; however, these are limited to within the designated geographic scope and time frame. Reasonably foreseeable future actions are not limited to those that are approved or funded. However, this analysis does not speculate about future actions that are merely possible but not highly probable based on information available at the time of this analysis.

For this cumulative effects analysis, the time frame considered for cumulatively-considerable projects includes projects recently approved or completed that are not yet addressed as part of the existing conditions of the area, projects under construction, and projects that are in the environmental review or planning process and for which enough information is available to discern their potential impacts. Projects for which no or insufficient information is known, or for which substantial uncertainty exists regarding the project are considered speculative and are not evaluated as part of this analysis.

4.2.3 Past, Present, and Reasonably Foreseeable Projects

4.2.3.1 Projects

Cumulative project locations are described in Table 4-1 and depicted on Figure 4-1. Also provided in Table 4-1 is a summary of the potential impacts (by resource area) of relevance to the Proposed Action analyzed in this EA.

4.3 ENVIRONMENTAL CONSEQUENCES

This section addresses the potential cumulative impacts of the Proposed Action in conjunction with the aforementioned cumulative projects. If a project would not result in direct or indirect impacts on a resource, no further evaluation from a cumulative impact perspective is warranted. CEQ guidance states, "*A cumulative effects analysis should 'count what counts,' not produce superficial analyses or a long laundry list of issues that have little relevance to the effect of the proposed action or the eventual decisions*" (CEQ 1997). Therefore, the cumulative impact analysis focuses on: (1) those resource areas that may be significantly impacted by the project; and/or (2) those resource areas currently in poor or declining health or at risk even if project impacts would be relatively small. The resources that meet these criteria are: water resources (Section 3.3), biological resources (Section 3.4), cultural resources (Section 3.5), public health and safety (Section 3.6), air quality (Section 3.7), and noise (Section 3.8).

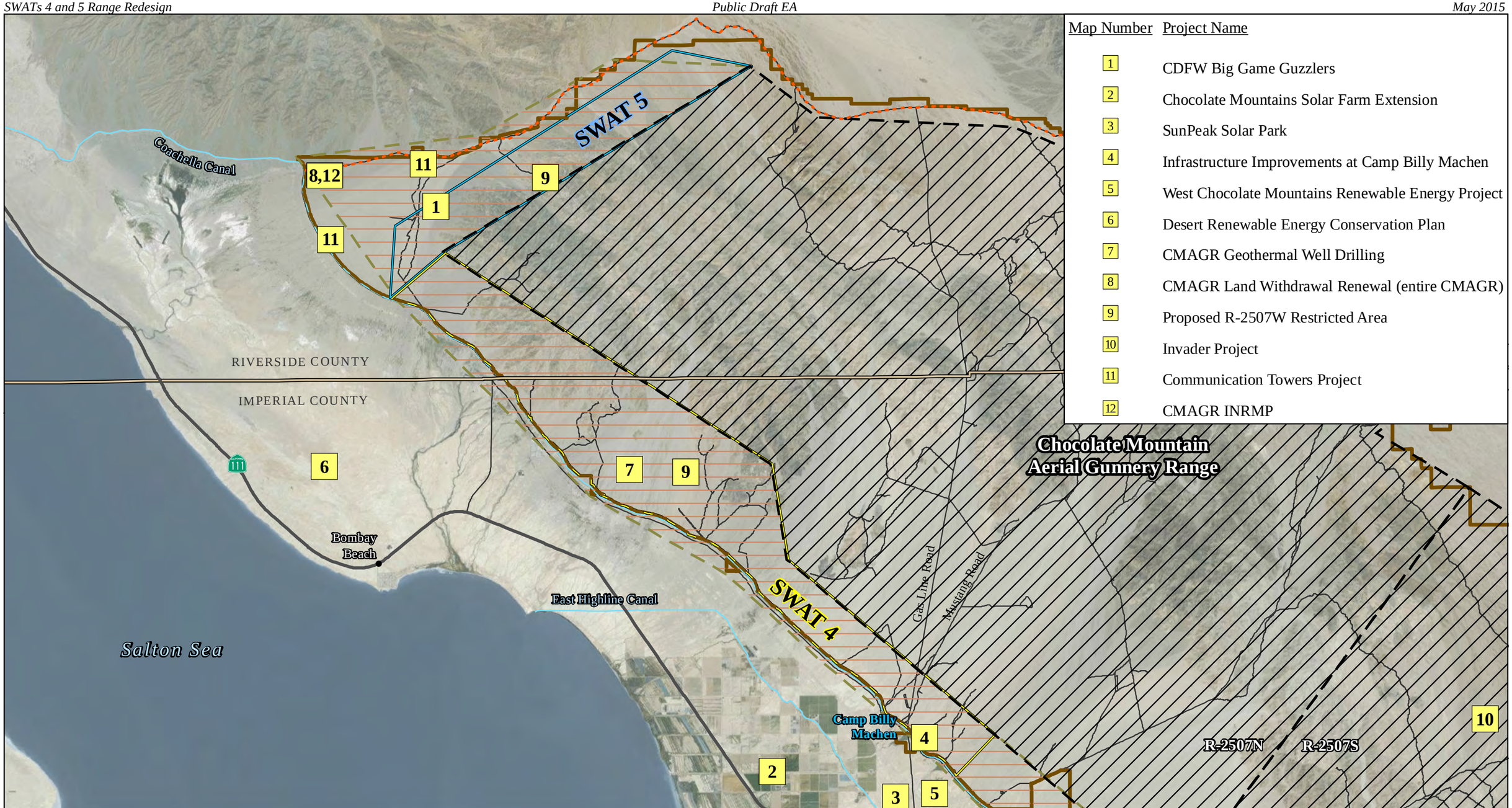
The resource area that does not meet these criteria is geology and soils (Section 3.2). Because the Proposed Action would include measures to limit erosion in an already naturally highly erosive environment and would not place inhabited structures within a fault zone, the Proposed Action would not cumulatively contribute to a decrease in geological or soil resources in the ROI. Therefore, the Proposed Action would not cumulatively contribute to impacts to this resource area, and potential cumulative impacts to geology and soils are not evaluated further in this section.

Table 4-1. Cumulative Projects and Associated Anticipated Impacts

Project Number[1] and Name	Project Location	Project Description	Current Project Status	Notable Potential Project Impacts[2]
(1) CDFW Big Game Guzzlers	CMAGR	Installation of eight wildlife guzzlers.	Implemented in 2009	• Beneficial impacts to big horn sheep and desert mule deer.
(2) Chocolate Mountain Solar Farm Extension	Northwest of Niland	Construction of a 49.9-megawatt photovoltaic solar power plant.	Conditional use permit obtained (2013)	• Impacts to air quality. • Beneficial socioeconomic impacts via increased local employment. • Beneficial impacts to GHG.
(3) SunPeak Solar Park	Northeast of Niland	Construction of a 23-megawatt fixed solar photovoltaic system and substation on a 123-acre (50-ha) property.	Construction complete (July 2012)	• Impacts to air quality. • Beneficial socioeconomic impacts via increased local employment. • Beneficial impacts to GHG.
(4) Infrastructure Improvements at Camp Billy Machen (P-771)	Near Niland	Utility upgrades, construction of instructional spaces, materials handling and material preparation facilities, and berthing.	FONSI signed in April 2012. A Supplemental EA for addition utility upgrades is in progress.	• Impacts to desert tortoise and air quality.
(5) West Chocolate Mountains Renewable Energy Evaluation	Near Niland	Evaluated the suitability of geothermal and solar energy development within the West Chocolate Mountains Renewable Energy Evaluation Area.	ROD signed (2012)	• Impacts to geological resources, recreation, air quality, and desert tortoise critical habitat. • Beneficial impacts to socioeconomics and GHGs.
(6) Desert Renewable Energy Conservation Plan	Mojave and Colorado deserts, CA	Provide binding, long-term endangered species permit assurances while facilitating review and approval of renewable energy projects.	The Draft Environmental Impact Report/EIS was released in September 2014.	• Impacts to desert tortoise critical habitat and cultural resources. • Beneficial impacts to socioeconomics and GHGs.

Project Number[1] and Name	Project Location	Project Description	Current Project Status	Notable Potential Project Impacts[2]
(7) CMAGR Geothermal Well Drilling	CMAGR, northwest of Camp Billy Machen	Drill geophysical test holes to investigate hydrothermal potential at three sites.	Project complete (2011)	• Impacts to desert tortoise, groundwater, and geology and soils.
(8) CMAGR Land Withdrawal Renewal (entire CMAGR)	CMAGR	BLM withdrawn lands within the CMAGR would continue to be withdrawn and reserved for continued military use, and CMAGR boundary would be realigned to exclude the Bradshaw Trail from the CMAGR.	Final Legislative EIS, published in January 2014. Legislation included in the FY 2014 National Defense Authorization Act.	• Military activities would continue to impact desert tortoise, water resources, air quality, and cultural resources. • Beneficial impacts to socioeconomics. • BLM-withdrawn land will be transferred to the DoN; the DoN will manage all CMAGR land per the Sikes Act.[3]
(9) Proposed R-2507W Restricted Area	Airspace overlying SWATs 4 & 5	Establishment of Restricted Area in support of aviation and ground training requirements.	FONSI signed June 2014	• Impacts to airspace, noise, and socioeconomics.
(10) Invader Project	R-2507S	New air-to-ground target complex.	Draft EA in progress	• Impacts to desert tortoise, water resources, and geology and soils.
(11) Communication Towers Project	West and North of SWAT 5 within the CMAGR	Establishment of two radio communication towers.	NEPA not yet started	• Given small project footprint and beneficial impact to training safety, negligible impacts anticipated to all resources.

Notes: [1] Project numbers correspond to project locations presented on Figure 4-1.
[2] See Section 4.3 for a discussion of which resource areas are analyzed at a cumulative level and why.
[3] The Sikes Act, as amended (16 USC §§ 670-670f), sets forth specific resource management policies and guidance for U.S. military installations and requires the preparation of INRMPs for installations with significant natural resources to provide for the conservation and rehabilitation of natural resources on military installations, which includes military test and training ranges and, where consistent with the military purposes of the installation and otherwise appropriate, the sustainable multipurpose use of those resources.



Legend

- # Cumulative Project
- SWAT 4
- SWAT 5
- CMAGR Boundary
- R-2507N/S
- Proposed R-2507W
- Bradshaw Trail
- Overlapping SWAT 4 and CMAGR Boundaries
- Overlapping SWAT 4 and R-2507N Boundaries
- Overlapping SWAT 5 and R-2507N Boundaries
- County Boundary
- Canal
- Highway
- Road

Note: Depicted project locations are approximate.

Figure 4-1
General Location of Cumulative Projects within the Vicinity of the Project Area

0 2 4 Miles
0 2 4 Kilometers

Sources: MCAS Yuma 2012, 2015; Navy 2013

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4.3.1 Cumulative Impacts

4.3.1.1 Water Resources

The ROI for the cumulative analysis of water resources is the Salton Sea Watershed, a subset of the Colorado River Basin. The area around the Salton Sea is one of the most productive agricultural regions in the U.S. One of the major functions of the Salton Sea is to serve as a sump for agricultural runoff. Approximately 75 percent of the freshwater inflow to the Salton Sea consists of agricultural runoff. The Salton Sea has no outlets, resulting in a closed system. Water quality is thus subject to the quality of the inflow, and evaporation rates. Inflow is mostly comprised of highly saline water containing agriculture-related chemicals and wastewater, which can contribute to algal blooms and high bacterial levels. The Salton Sea is 25 percent saltier than the ocean, with salinity increasing at one percent per year (Colorado River Basin RWQCB 2003).

As presented in Section 4.3.1, several projects have been identified in the ROI. Both the Desert Renewable Energy Conservation Plan (DRECP) and West Chocolate Mountains Renewable Energy EIS are planning efforts, and no specific development program or footprint has been established. As such, it is not feasible at this stage to identify any regional impact relative to water resources. However, the DRECP provides a broad scale analysis of all renewable energy desert projects potentially affecting water resources in California, and will be a useful tool in informing future cumulative impact assessments once renewable energy projects have been identified. Similarly, the West Chocolate Mountains Renewable Energy EIS serves to identify appropriate regions for renewable energy development, rather than authorizing developments. Thus, the EIS provides a narrowing of analysis for future projects, and any action proponents would be required to analyze and minimize impacts to environmental resources at the time they seek authorization to pursue their proposed projects.

The Draft DRECP Environmental Impact Report (EIR)/EIS was released in September 2014 (California Energy Commission 2014). Many of the renewable projects within the DRECP Plan Area would be located outside of the Salton Sea watershed and would have minimal, if any, impacts to water resources. In addition, during construction of renewable projects, proponents would complete a SWPPP with associated BMPs required by the Construction General Permit. Project proponents would be required to conduct hydrologic modeling to help design facilities to mitigate flood risk. Although no specific project are authorized from the West Chocolate Mountains Renewable Energy EIS and the DRECP EIR/EIS, no significant cumulative impacts are expected from future projects, as it is assumed that they would adhere to water quality laws and regulations.

The SunPeak Solar Park is implementing stormwater controls to ensure that all stormwater runoff is retained onsite (SunPeak Solar 2011). Furthermore, each of the identified cumulative projects would be required to comply with construction and operational BMPs. The land transfer process that was legislated as a result of the CMAGR Land Withdrawal Renewal EIS will consolidate natural resource management and care under a single agency (i.e., the USMC), likely improving the implementation of mitigation, monitoring, and accountability, resulting in beneficial impacts to water resources in the ROI. With implementation of proposed wastewater utility improvements under P-771, wastewater treatment process at Camp Billy Machen would improve, resulting in beneficial impacts to groundwater quality. Thus, the SunPeak Solar Park, the CMAGR legislated land transfer, and the P-771 projects would not affect water resources or contribute to cumulative impacts.

Given the low precipitation and high evaporation rates in the area, stormwater flows originating within the CMAGR rarely reach off-range receiving waters. The toxicity thresholds for humans and other

biological receptors are several magnitudes above the estimated MC concentrations reaching the range boundary (USMC 2008b); no impact to water quality is anticipated. The relevant AMMMs identified in Section 2.9 would be implemented and maintained to reduce potential impacts to water resources from implementation of the Proposed Action. Therefore, when added to the identified cumulative projects, the Proposed Action would not result in cumulative water resource impacts in the ROI.

4.3.1.2 Biological Resources

This cumulative analysis focuses on the desert tortoise, the only biological resource with any potential for significant cumulative effect. The ROI for the cumulative analysis of the desert tortoise is the Colorado Desert Recovery Unit of the Agassiz's desert tortoise (formerly known as the Mojave population of the desert tortoise).

The desert tortoise was federally listed as threatened in 1990 in response to habitat loss and degradation caused by human activities including urbanization, agricultural development, military training, recreational use, a modified fire regime caused by introduced plant species, changes in perennial vegetation communities, mining, livestock grazing, and a lack of regulatory mechanisms (USFWS 1990). The loss of individual desert tortoises to increased predation by common ravens, canids (i.e., coyotes, kit foxes [*Vulpes macrotis*] and dogs [*Canis familiaris*]), and golden eagles (*Aquila chrysaetos*); collection by humans for pets or consumption; fire; collisions with vehicles on paved and unpaved roads; and mortality resulting from disease (upper respiratory tract disease) also contributed to the listing of this species (USFWS 2011). Approximately 188,000 acres (76,081 ha) of critical habitat for the desert tortoise was designated in 1994 within the Chuckwalla Desert Wildlife Management Area (USFWS 1994a) (see Figure 3.5-3).

The BLM formalized the general Desert Wildlife Management Areas from the 1994 Recovery Plan through its planning process and currently administers them as Areas of Critical Environmental Concern (USFWS 1994a, 1994b, 2011). The USFWS prepared a revised recovery plan in 2011. The plan outlines a strategy for recovery of the desert tortoise and divides the plan area into five recovery units (USFWS 2011). The project area occurs near the Colorado Desert Recovery Unit.

The vast majority of threats to the desert tortoise or its habitat are associated with human land uses. Since the 1800s, portions of the desert southwest occupied by desert tortoises have been subject to a variety of impacts that cause habitat loss, fragmentation, and degradation, thereby threatening the long-term survival of the species. Some of the most apparent threats are those that result in mortality and permanent habitat loss across large areas, such as urbanization, and those that fragment and degrade habitats, such as proliferation of roads and highways, off-highway vehicle activity, poor grazing management, and habitat invasion by nonnative invasive species. Indirect impacts to desert tortoise populations and habitat are also known to occur in areas that interface with intense human activity.

Areas within the ROI that have not been developed have experienced a lesser degree of disturbance and contain a higher percentage of native habitat, and thus present a higher biological value to desert tortoises in terms of forage/protective cover and nesting habitat, as compared to developed areas. Based on the existing plant communities, observed animal species, and influential factors (e.g., availability of water), the overall biological condition is good, but is less than pre-development conditions. The area surrounding the project area is suitable desert tortoise habitat dominated by creosote scrub. Military training include instructions and procedures to protect sensitive and federally listed species, including the desert tortoise.

The DRECP and West Chocolate Mountains Renewable Energy EIS are planning, non-development projects. As such, neither project would contribute to a regional impact on special-status species. However, as discussed above, the DRECP would provide data on all desert projects potentially affecting biological resources. Similarly, the West Chocolate Mountains Renewable Energy EIS identifies potential sites that minimize or avoid potential impacts to biological resources (BLM 2012). Thus, the EIS will narrow analysis for future projects, while project proponents would be required to evaluate and mitigate for environmental impacts at the time they seek authorization to pursue electricity generation. The proposed Invader EA project would be subject to coordination with the USFWS, likely via a BO that would include AMMMs similar to those presented in Section 2.9 to reduce and/or mitigate the potential for any impacts to the desert tortoise. While solar power projects can be a point of concern for biological resources, the SunPeak Solar Park is located outside of designated critical habitat for the desert tortoise.

As a result of the legislation included in the FY 2014 National Defense Authorization Act for the CMAGR land transfer, the DoN will be responsible for managing natural and cultural resources and preparing an INRMP at the CMAGR. As of July 2014, the INRMP has been finalized. Management will be delegated to the Marine Corps, which will act locally through the Commanding Officer, MCAS Yuma. The CMAGR INRMP provides an integrated, comprehensive plan for managing the natural resources of the CMAGR and for managing sustainable public use of those resources to the extent that such management and use is consistent with the military purposes of the range. Natural resources and military use will be managed so that there is no net loss in the capability of the CMAGR to support its military purposes and in a manner that is consistent with ecosystem management principles. Further, management prescribed by the INRMP will benefit threatened and endangered species on the CMAGR consistent with federal and state recovery actions for these species under the ESA.

The Proposed Action could potentially contribute to cumulative impacts on special-status species. However, through the implementation of AMMMs listed in Section 2.9, the Proposed Action is not anticipated to contribute to a cumulative impact to the desert tortoise. Furthermore, the implementation of the revised desert tortoise recovery plan will resolve key uncertainties about threats and management, thereby improving recovery potential (USFWS 2011). In addition, through the implementation of the management actions that will be prescribed in the CMAGR INRMP, the desert tortoise as well as other natural resources would benefit. Therefore, the Proposed Action is not anticipated to contribute to a cumulative impact to biological resources.

4.3.1.3 Cultural Resources

The ROI for the cumulative analysis of cultural resources is SWATs 4 and 5, but as discussed within the greater context of the CMAGR. Prehistoric sites and historic-period built environment resources both individually and when evaluated together provide an important window into the past, particularly when these resources are found in the same setting and context in which they originated. These resources and their original settings also represent places of traditional importance to Indian Tribes. The CMAGR is a major land unit in a greater area east of the Coachella Canal that comprises the largest relatively undisturbed tract of the Sonoran Desert in California (DoN 2013).

Military training activities that directly affect the surface of SWATs 4 and 5 are clearly defined and localized to specific areas. After approximately 70 years of military use, the majority of SWATs 4 and 5 retain their original natural desert setting and exhibit ground surfaces that are largely undisturbed. Further, the need to protect public safety from hazards associated with live-fire training, UXO, and other military activities, and to prevent interruption of training schedules, has required that SWATs 4 and 5 be closed to public access. These conditions, which are incidental consequences of the range and range training, do not

guarantee protection of cultural resources; but, nevertheless, they benefit the preservation of prehistoric sites, historic-period built environment resources, and the context and settings in which they originated (DoN 2013).

All cumulative projects having a potential to impact cultural resources either have or would undergo Section 106 review by the SHPO and would be mitigated as required. Mitigation measures may include monitoring, excavation, or other measures designed to minimize impacts to cultural resources. While individual projects as well as day-to-day management of cultural resources by MCAS Yuma would continue to minimize the potential for impacts to cultural resources, the potential deterioration of cultural resources due to past and present and reasonably-foreseeable projects (on-going training, future undertakings, and/or public vandalism) would occur. However, the level of cumulative impact is not anticipated to be significant given the active management, dispersed nature of training and projects, and the relative isolation of the ROI. Therefore, the Proposed Action is not anticipated to contribute to a cumulative impact to cultural resources.

4.3.1.4 Public Health and Safety

The ROI for public health and safety includes those identified cumulative projects within the CMAGR. Military training within the ROI often involves activities that are inherently hazardous to non-participating personnel, vehicles, or aircraft. Military ranges, including the CMAGR, and restricted airspace are designed to protect the safety of the public and military personnel alike by restricting non-participants from training areas and airspace where hazardous activities are occurring and by conducting live-fire weapons use in accordance with DoD standards that there be a 99.9999 percent probability of containing all munitions or munitions fragments within the range and airspace boundaries (DoN 2013). SDZs would continue to be contained within the CMAGR under cumulative project conditions. The proposed R-2507W SUA Restricted Area would further de-conflict civilian air traffic and DoD airspace and training activities, and enhance public health and safety.

The Proposed Action in conjunction with the past, present, and reasonably foreseeable projects would increase ordnance and munitions use, collectively increasing the likelihood of UXO migration off the CMAGR; however, the risk would remain low, as no off-CMAGR UXO migration has been identified. MCAS Yuma would continue to conduct UXO sweeps on a quarterly basis to clear UXO to the extent safe and practicable. Cumulative increases in munitions/ordnance use would also result in the increased deposition of MCs and chemical residues throughout the CMAGR. However, those increases are not likely to elevate public health and safety concerns because pathways to human receptors have not been identified. While the MCAS Yuma REVA (USMC 2008b) has concluded that no MC-related risk is posed to persons or the environment, on-going sampling and analysis will continue through the REVA process, which is conducted every five years.

Past, present, and reasonably foreseeable future actions would not directly cause additive or interactive effects that would expose either non-participating or military personnel to increased risks associated with military activities. For example, establishment of the proposed R-2507W SUA (NAVFAC SW 2014a) would result in a beneficial impact to safety, as the potential for non-participating (i.e., civilian and commercial) aircraft to enter airspace above SWATs 4 and 5 during training would be reduced. In addition, none of the identified past, present, and reasonably foreseeable future actions would have an additive effect that would somehow increase the frequency of unauthorized entry to the CMAGR. Rather, the minor changes in the CMAGR boundary associated with the Legislative EIS (DoN 2013) would reduce the risk of unauthorized and unintentional trespass by establishing well defined and visually prominent boundary alignments, to reduce public misunderstanding as to the presence or location of the

CMAGR. Furthermore, the Proposed Action includes the placement of hundreds of notification signs and the construction of fencing to help reduce the amount of trespassing. Therefore, the Proposed Action is not anticipated to contribute to a cumulative impact to public health and safety.

4.3.1.5 Air Quality

The ROI for the cumulative analysis of air quality is the SSAB. The SSAB is comprised of a portion of the SCAQMD, which consists of the central portion of Riverside County (the Coachella Valley) and the ICAPCD, which consists of Imperial County. The SSAB is in moderate nonattainment of the federal and state O_3 standards, and is in serious nonattainment of the federal and state PM_{10} and $PM_{2.5}$ standards. The SSAB is in attainment of all other criteria pollutant standards.

Both the Coachella and Imperial valleys suffer from poor air quality, with very high concentrations of small particulate matter. Many practices and actions impair air quality in the Basin, including agriculture and the desert surroundings more generally. The poor air quality causes health problems, especially in children. Dust storms periodically swirl off of exposed areas of the Salton Sea lakebed, adding to the high volumes of dust already in the basin (Pacific Institute 2006). Being part of a larger contributing air basin (the SCAQMD), air quality within the ROI is also impacted by pollutant transport from upwind sources of emissions.

In November 2005, the ICAPCD adopted new rules and regulations, requiring actions to prevent, reduce, or mitigate PM_{10} emissions (among others). These rules and regulations include actions such as wetting roads, phasing work in shifts, covering loads, etc., as described for example in Rule 800, *General Requirements for Control of Fine Particulate Matter (PM_{10})*. While local emissions controls benefit the regional air quality, the area must also rely on emissions controls being implemented upwind to demonstrate improved air quality and attainment of the federal and state standards.

The Salton Sea is likely to continue to shrink, increasing the area of exposed lakebed. This drop in water levels is anticipated to result in more episodes of blowing dust. For example, the exposure of an additional 26 m^2 (67.4 km^2) of lakebed could generate an additional 17 tons of fine dust (PM_{10} and $PM_{2.5}$) per day, resulting in human health impairments within the ROI (Pacific Institute 2006). While the 2005 ICAPCD rules and regulations would continue to work towards improving air quality within the ROI, air quality within the ROI would continue to be largely impacted by the fate of the Salton Sea and controls on upwind sources of emissions.

The cumulative projects would be required to demonstrate compliance with CAA conformity applicability requirements at the time they seek authorization to pursue their proposed projects. Estimated emissions associated with the Proposed Action would be below the *de minimis* levels for CAA conformity (see Tables 3.7-5 through 3.7-9), or would comply with the SIP; therefore, a formal conformity determination would not be necessary and no significant impacts to air quality would occur. However, the Proposed Action could potentially contribute to cumulative impacts on air quality, particularly PM_{10} and $PM_{2.5}$ if the air quality within the Salton Sea Air Basin declines further.

4.3.1.6 Noise

The ROI for noise consists of SWATs 4 and 5 and adjacent communities. Several of the cumulatively considerable projects are located near noise-sensitive areas potentially affected by the Proposed Action (e.g., the Chocolate Mountains Solar Farm Extension, Utility Construction and Maintenance, and SunPeak Solar Park). However, these projects would not involve industrial or commercial activities or land uses that would introduce new stationary or mobile sources of operational noise. Although ambient noise levels at noise-sensitive areas may temporarily increase during the construction of these projects,

such impacts would be short-term and would likely be minimized through application of AMMMs (e.g., scheduling construction to avoid night or early morning hours) that would be identified in required environmental documentation (i.e., NEPA and/or the California Environmental Quality Act[5] analyses).

One project, the proposed establishment of R-2507W, would result in an increase in the aircraft-generated noise environment. The cumulative increase in sorties resulting from the establishment of R-2507W in conjunction with the Proposed Action would not result in a noticeable change to the noise environment at noise-sensitive areas. As demonstrated in Table 4-2, the combined noise level at all locations would be less than 65 dB CNEL. Therefore, the Proposed Action is not anticipated to significantly contribute to a cumulative noise impact.

Table 4-2. Baseline and Cumulative Predicted Noise Levels at Noise-Sensitive Areas

Noise Sensitive Area[1]	Predicted Community Noise Equivalent Levels (dB)		
	Baseline	Cumulative	Change From Baseline[2]
Clinic	41.8	42.2	0.4
Elementary School	41.9	42.3	0.4
Health Spa	48.7	50.5	1.8
House of Worship 1	42.3	42.7	0.4
House of Worship 2	36.9	37.7	0.8
Informal Community	49.5	50.3	0.8
Library	41.4	41.8	0.4
Residential 1	45.8	47.9	2.1
Residential 2	46.8	48.6	1.8
Residential 3	45.2	46.6	1.4
Residential 4	49.9	50.0	0.0
Residential 5	45.4	46.8	1.4
Residential 6	47.3	48.9	1.6
Salton Sea National Wildlife Refuge	41.4	41.8	0.4
Salton Sea State Park	< 35.0	< 35.0	0.0

Notes: [1] See Figure 3.8-1 for the locations of the noise-sensitive areas.
[2] Increase in dB, as compared to baseline.

[5] Codified at California Public Resources Code §§ 21000 et seq., the California Environmental Quality Act requires planning analyses to disclose and minimize environmental damage.

CHAPTER 5
OTHER CONSIDERATIONS REQUIRED BY NEPA

5.1 POSSIBLE CONFLICTS BETWEEN THE PROPOSED ACTION AND THE OBJECTIVES OF FEDERAL, STATE, LOCAL, AND REGIONAL LAND USE PLANS, POLICIES, AND CONTROLS

Implementation of the Proposed Action would comply with all applicable federal, state, and local statutes and regulations (refer to Section 1.6, *Regulatory Setting*), as well as all applicable federal, state, regional, and local policies and programs.

5.2 CLIMATE CHANGE

The *Revised Draft Guidance on the Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in NEPA Reviews* issued by the CEQ on December 18, 2014 recommends incorporating impacts associated with climate change as part of the standard cumulative impact analysis of all NEPA documents. The draft guidance encourages agencies to determine which climate change impacts warrant consideration in their analyses based on both the Proposed Action's potential impact to climate changes and the potential impact a changing climate may have on implementation of the Proposed Action.

The USEPA developed a "State of Knowledge" website following the 2007 Intergovernmental Panel on Climate Change report. The USEPA affirms that while the contribution is uncertain, human activities are substantially increasing GHG emissions, which, in turn, are contributing to a global warming trend (USEPA 2014d). The U.S. Global Change Research Program (USGCRP) is a working group coordinating the efforts of 13 different federal agencies, including the USDA, the Department of the Interior, the DoD, and the Department of Energy. The USGCRP releases regular reports presenting the most current scientific consensus of predicted changes associated with global climate change. The 2014 National Climate Assessment report is the most recent complete report. This report summarizes the science of climate change and the impacts of climate change on the U.S., now and in the future, and is recommended by the CEQ 2014 draft guidance as the primary source for framing climate change discussions.

5.2.1 Predicted Future Conditions

The USGCRP looks to two potential future conditions as part of its predictive modeling process. Under conditions of lower GHG emissions, the average temperature in southeastern California may increase as much as 2.5°F by 2050, 3.5°F by 2070, and 5.5°F by 2099. Under conditions of higher continuous GHG emissions, the potential increase is greater in the long-term, and may be as much as 7.5°F by 2099. Projected changes in long-term climate predict more frequent extreme events such as heat waves and droughts (USGCRP 2014).

Current simulations predict decreasing precipitation, snowpack, runoff, and soil moisture for the region into the future. Specifically, winter and spring precipitation may decrease between 0 and 30 percent from currently observed levels, with biggest reduction predicted under the higher emissions scenario. While total precipitation is projected to decrease, the frequency of extreme rain events with the high potential for flooding is projected to increase. At the same time, extreme heat events are also expected to increase in frequency and magnitude. The temperatures observed during extreme events are projected to increase by

3°F to 9°F, depending on the emissions scenario used for predictive modeling (USGCRP 2014). This change in precipitation and heat would likely alter agricultural and ecosystem conditions.

As temperatures increase in the current century, optimal zones for growing crops will shift. Pests that were historically unable to survive in cooler areas may spread northward. Milder winters and earlier springs also may encourage greater numbers of pest species. Rising carbon dioxide (CO_2) levels in the atmosphere may increase growth of both crop and weed species. In some areas, water scarcity may reduce or even eliminate certain types of agricultural production. Similarly, changes in temperature and precipitation affect the composition and diversity of native animals and plants through altering their breeding patterns, water and food supply, and habitat availability. In a changing climate, populations of some pests such as red fire ants and rodents, better adapted to a warmer climate, are projected to increase (USGCRP 2014).

5.2.2 Impact of the Proposed Action on Climate Change

GHGs are gases that trap heat in the atmosphere by absorbing infrared radiation. The most common GHGs emitted from natural processes and human activities include CO_2, methane (CH_4), and nitrous oxide (N_2O). Each GHG is assigned a global warming potential (GWP). The GWP is the ability of a gas or aerosol to trap heat in the atmosphere. The GWP rating system is standardized to CO_2, which has a value of one. For example, CH_4 has a GWP of 21, which means that CH_4 has a global warming effect 21 times greater than CO_2 on an equal-mass basis (Intergovernmental Panel on Climate Change 2007). To simplify GHG analyses, total GHG emissions from a source are often expressed as a CO_2 equivalent (CO_2e). The CO_2e is calculated by multiplying the emissions of each GHG by its GWP and adding the results together to produce a single, combined emission rate representing all GHGs. While CH_4 and N_2O have much higher GWPs than CO_2, because CO_2 is emitted in such higher quantities, CO_2 represents the overwhelming contributor to CO_2e from both natural processes and human activities.

With regard to GHGs, federal agencies on a national scale address emissions of GHGs by reporting and meeting reductions mandated in federal laws, EOs, and agency policies. The most recent of these is EO 13693 and the *USEPA Final Mandatory Reporting of Greenhouse Gases Rule*. Several states have promulgated laws as a means of reducing statewide levels of GHG emissions. In particular, the California Global Warming Solutions Act of 2006 (Assembly Bill 32) directs the State of California to reduce statewide GHG emissions to 1990 levels by the year 2020. Groups of states also have formed regionally based collectives (such as the Western Climate Initiative) to jointly address GHG pollutants.

This EA compares GHG emissions that would occur from implementation of Alternative 1 or Alternative 2 to the U.S. net GHG baseline inventory of 2012 (USEPA 2014d) to determine the relative increase in proposed GHG emissions that would result for the implementation of the Proposed Action. Table 5-1 summarizes the annual GHG emissions associated with the No-Action Alternative, which are equivalent to existing conditions.

Table 5-1. Estimated Greenhouse Gas Emissions from the No-Action Alternative

Scenario/Activity	Metric Tons per Year[a] CO_{2e}
No-Action Emissions	948
Draft NEPA Threshold[b]	25,000
U.S. 2012 Baseline Emissions[c]	$5{,}546.3 \times 10^6$
Proposed Emissions as a percent of U.S. Emissions	0.00002%

Notes: [a]$CO_2e = (CO_2 * 1) + (CH_4 * 21) + (N_2O * 310)$.
Sources: [b]CEQ 2014; [c]USEPA 2014d.

Table 5-2 summarizes the annual GHG emissions associated with Alternative 1 or Alternative 2 (GHG emissions would be the same for either alternative). Appendix G presents estimated GHG emissions generated by Alternative 1 or Alternative 2. These data show that the additional CO_2e emissions associated with either alternative (after subtracting the baseline emissions) would amount to approximately 0.00007 percent of the total CO_2e emissions generated from all sources in the U.S. in 2012 (the most recent data available) (USEPA 2014d). Emissions under either Alternative 1 or Alternative 2 would be below the 25,000 metric tons of CO_2e level proposed in the draft NEPA guidance by the CEQ as the threshold warranting a more substantial evaluation of—but not necessarily a determination of—significance of climate change impact (CEQ 2014). Thus, the implementation of either Alternative 1 or Alternative 2 would not contribute significantly to global climate change.

Table 5-2. Estimated Greenhouse Gas Emissions from Implementation of Alternatives 1 or 2

Scenario/Activity	Metric Tons per Year[a] CO_2e
Baseline (No-Action Alternative) Emissions	948
Alternative 1 or 2 Emissions	4,536
Net Increase in GHG Emissions	**3,588**
Draft NEPA Threshold[b]	25,000
U.S. 2012 Baseline Emissions[c]	$5{,}546.3 \times 10^6$
Proposed Emissions as a % of U.S. Emissions	0.00007

Notes: [a]$CO_2e = (CO_2 * 1) + (CH_4 * 21) + (N_2O * 310)$.
Sources: [b]CEQ 2014; [c]USEPA 2014d.

5.2.3 Impact of Climate Change on the Proposed Action

Climate change has the potential to impact the training as described under the Proposed Action. Increased frequency of extreme precipitation events could interrupt training due to localized flooding. The degree of the increase of extreme rainfall events is not currently predictable with a high level of certainty. However, any future proposed stormwater conveyance infrastructure should be designed anticipating this potential rather than relying on historical precipitation events. Likewise, more frequent, and hotter, heat waves may present greater health risks than are currently considered in training. However, these additional stresses are not predicted to be local to the project area, but would instead be global in nature. Thus, while these conditions may pose additional challenges to conducting training, integrating them into training will be necessary for combat readiness in the field in similar global climates.

5.3 ENERGY REQUIREMENTS AND CONSERVATION POTENTIAL OF ALTERNATIVES INCLUDING THE PROPOSED ACTION AND ALL MITIGATION MEASURES BEING CONSIDERED

As discussed in Section 2.7.1, the Proposed Action reflects the culmination of an iterative process that successively reduced impacts to resources without sacrificing operational training needs. The resulting design also reflects features that represent the minimum amount of materials and associated energy to construct. Furthermore, reducing the level of future maintenance (and thus energy needed) for the Proposed Action was factored into the project design. In addition, on-site borrow sources have been identified for use in lieu of having to bring in material from off-site. This reduces the amount of miles and time needed to bring material to the construction site, thus resulting in substantial energy, not to mention, resource area savings.

The resulting training infrastructure identified under the Proposed Action would have no direct energy requirements; all training infrastructure would be passive and/or powered by portable (i.e., generators) or renewable (i.e., solar powered) energy sources. As much as would be applicable for a training-related action such as this one, implementation of the Proposed Action would incorporate energy conservation measures. Specifically, proposed infrastructure improvements would follow Federal Energy Acts compliance criteria for design, development, and construction. The facilities would be designed to meet or exceed the useful service life specified in DoD Unified Facility Criteria. The facilities would incorporate features that provide the lowest practical life cycle cost solutions satisfying the facility requirements with the goal of maximizing energy efficiency.

Sustainable design principles would be included in the design and construction of the Proposed Action in accordance with EO 13693, *Planning for Federal Sustainability in the Next Decade*. The proposed facilities would meet Leadership in Energy & Environmental Design ratings and comply with the Energy Policy Act of 2005 and the Energy Independence and Security Act of 2007. Low Impact Development would be included in the design and construction of the Proposed Action as appropriate.

5.4 IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF NATURAL OR FINITE RESOURCES

Resources that are irreversibly or irretrievably committed to a project are those used on a long-term or permanent basis. This includes the use of non-renewable resources such as metal and fuel, and other natural or cultural resources. These resources are “irretrievable” when used for one project when another action could have used them for another purpose. Human labor is also 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.

Under the Proposed Action, construction activities associated with range redesign would require the use of limited amounts of materials typically associated with buildings and structures (e.g., concrete, steel, wood, plastic). The use of construction vehicles would result in the consumption of additional limited amounts of fuel, oil, and lubricants. Due to the anticipated limited use of these resources, their use would not constitute a significant irreversible or irretrievable commitment of resources.

5.5 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USE OF THE HUMAN ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM NATURAL RESOURCE 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 option reduces future flexibility in pursuing other options, or that designate a parcel of land or other resource to a certain use often eliminates the possibility of other uses at that site.

The Proposed Action would result in short-term effects primarily related to construction activities involving the use of vehicles and equipment used for other purposes. The Proposed Action would not result in any impacts that would reduce environmental productivity, permanently narrow the range of beneficial uses of the environment, or pose long-term risks to health, safety, or the welfare of the public.

5.6 MEANS TO MITIGATE AND/OR MONITOR ADVERSE ENVIRONMENTAL IMPACTS

The AMMMs presented in Section 2.9 would be incorporated into the project design and implementation.

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CHAPTER 6
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CHAPTER 8
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Appendix A contains relevant correspondence conducted as part of this EA. Agencies and personnel contacted in the course of preparing this EA are as follows:

State and Federal Agencies

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USFWS

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Indian Tribes

Aqua Caliente Band of Cahuilla Indians

Ak-Chin Indian Community

Augustine Band of Cahuilla Mission Indians

Barona Band of Mission Indians

Cabazon Band of Mission Indians

Cahuilla Band of Mission Indians

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Manzanita Band of Mission Indians

Mesa Grande Band of Mission Indians

Morongo Band of Mission Indians

Quechan Indian Tribe

Ramona Band of Cahuilla Mission Indians

Salt River Pima-Maricopa Indian Community

San Manuel Band of Mission Indians

San Pasqual Band of Mission Indians

Santa Rosa Band of Cahuilla Mission Indians

Santa Ysabel Band of Diegueno Indians

Sycuan Band of Mission Indians

Tohono O'Odham Nation

Torres-Martinez Desert Cahuilla Indians

Twenty Nine Palms Band of Mission Indians

Viejas Band of Mission Indians

CHAPTER 9
GLOSSARY

This section provides definitions of terms and phrases used in this EA, as well as a description of typical training activities analyzed in this EA.

Area Reconnaissance Patrol: a small element conducts a foot patrol of a large area, remaining undetected using cover and concealment and reports the size, activity, location, unit, times, and equipment of simulated enemy activity.

Ballistics: the science of mechanics that deals with the flight, behavior, and effects of projectiles.

Basic Weapons and Munitions: small arms (rifles and pistols), machine guns, 40 mm grenade launchers, hand grenades, anti-tank weapons, and demolitions (shaped target charges, anti-personnel mines, etc.).

Battalion: a Marine infantry battalion consists of three rifle companies, a weapons company, and a headquarters company totaling approximately 900 personnel.

Claymore Mine: a command-detonated directional anti-personnel mine.

Concealment Area: area that can hide personnel and/or equipment from the enemy.

Contingency: a possibility that must be prepared for; a future emergency.

Convoy: group of vehicles traveling together for mutual support and protection.

Convoy and Formation Training: training activity that focuses on the basic positions of each vehicle in a tactical patrol based on the terrain. Vehicles can travel in file, wedges, and staggered positions.

Crew Served Weapon: any weapon system that requires more than one individual to function at optimal efficiency due to its operational complexity, such as requiring one person to load while another fires. Examples of crew served weapons include medium machine guns, heavy machine guns, automatic grenade launchers, mortars, anti-aircraft guns, recoilless rifles, and shoulder-launched missiles.

Defilade Weapons: weapons that fire on a target that is shielded by natural or artificial obstacles. For example, a mortar that can fire up and over a hill, reaching a target on the other side of the hill that is not seen via direct line of sight.

Demolitions: use of explosives, especially when designed or used as weapons.

Direct Action: small-scale offensive actions conducted as a special operation in hostile, denied, or politically sensitive environments and which employ specialized military capabilities to seize, destroy, capture, exploit, recover, or damage designated targets.

Direct Fire: fire delivered on a target that is visible to the personnel training the weapon.

Direct Fire Anti-mechanized Weapons: weapons that are employed against tanks and other armored vehicles.

Dismounted: personnel move solely by foot; no tactical vehicles are used to transport personnel.

Dismounted Immediate Action Drills: repetitive iterations of various maneuvers and live-fire training for small elements on foot, upon contact from front, left, right, rear, or multiple directions.

Dismounted Maneuver Areas: training areas designated for foot movement only.

Dud Producing Ordnance: an ammunition type or explosive that is designed to detonate and therefore may result in the generation of unexploded ordnance if the round does not function as designed. For example, a mortar.

Element: one task of a training program.

Field Demolition Skills: expertise acquired for the use of explosives.

Fields of Fire: an area that can be reached by ammunition fired from a weapon or a group of weapons.

Field Training Exercise: a highly coordinated and well-planned exercise designed to test the warfighting skills of SQT trainees.

Helicopter Fast-Rope: similar to helicopter rappelling, personnel descend ropes while controlling their rate of descent.

Helicopter Insertion and Extraction: in the insertion phase, a helicopter would land and personnel would exit and unload the helicopter, establish a security perimeter, and exit the landing zone to commence patrolling. In the extraction phase, personnel would have the additional tasks of communicating with the helicopter, marking the landing zone, guiding in the helicopter, and loading. This training may also include simulated ambushes and coordinated responses during the insertion and extraction.

Helicopter Rappelling: in this training, helicopters hover at a very low altitude over the landing zone while personnel practice hooking up, rappelling down a set of ropes to the ground, and de-rigging.

Helicopter Rope Suspension Training/Special Purpose Insertion and Extraction Rigging: this training includes various types of tethered insertion and recovery systems, including fast-rope, rappel, special purpose insertion and extraction, and McGuire Rigs. In an example of special purpose insertion and extraction rigging, the helicopter deploys a special rope with rings to recover personnel from the ground and then lift them to another location.

Indirect Fire: fire delivered on a target that is not itself used as the point of aim for the weapons. Also known as defilade fire.

Infantry: personnel trained, armed, and equipped to fight on foot.

Integration Training: an exercise that brings air, ground, and logistics elements together in one all-encompassing drill.

Live-Fire Exercise: any exercise involving the use of live ammunition.

Mortar: a muzzle-loading, indirect fire weapon that fires explosive projectiles at low velocities with high-arcing ballistic trajectories.

Mounted: personnel move using motorized vehicles (e.g., GMVs or ATVs).

Mounted IADs: training that involves various maneuvers for a vehicle formation upon contact from front, left, right, rear or multiple directions. Also involves dismounted supporting small arms live-fire in the IAD maneuver polygons.

Mounted Maneuver Areas: training areas designated for motorized, mechanized, or armored vehicles.

Navigation Routes: training that focuses on tactical vehicle movement negotiating terrain to a specific spot. This training involves maneuvering both on and off roads within designated maneuver areas.

Nonparticipating Aircraft: an aircraft, civil or military, which is not part of the training activities being conducted.

Ordnance: military ammunition.

Point Reconnaissance Patrol: similar to the Area Reconnaissance Patrol, but the objective would be a specified target.

Pyrotechnics: materials capable of undergoing self-contained and self-sustained exothermic chemical reactions for the production of heat, light, gas, smoke and/or sound.

Quadrennial Defense Review: a study by the DoD every four years that analyzes strategic objectives and potential military threats. The Quadrennial Defense Review is the main public document describing the United States' military doctrine.

Raid Exercise: this training consists of a troop executing a night attack on a simulated enemy target using stealth, surprise, firepower, and swift action to destroy or neutralize the target.

Range Estimation: the determination of the distance from your location to a distant point.

Restricted Airspace: an area of airspace that the local controlling authorities have determined that air traffic must be restricted for safety or security concerns.

Rotary-Wing Aircraft: heavier-than-air flying machine that uses lift generated by rotating blades.

Selected Personnel Abduction/Recovery: training that consists of a troop entering the objective area, conducting reconnaissance and surveillance, locating the selected personnel, securing and recovering them, and then exiting the objective area to be extracted.

Shaped Charge: an explosive charge shaped to focus the effect of the explosive's energy in a certain direction.

Small Arms: weapons an individual may carry on their person, for example pistols, assault rifles, sniper rifles, squad automatic weapons, light machine guns, and hand grenades.

Small Unit Supporting Arms: in this training, a troop would identify a target, call in rotary-wing aircraft to neutralize simulated enemy targets, and then break enemy contact. May also involve evacuation and evasion maneuvers.

Sniper: this training involves a sniper pair practicing sniper skills, including range estimation, marksmanship, field effects (e.g., wind and thermal conditions), and the calculation of the ballistics of individual weapons.

Special Operations Forces: those forces designated by the Secretary of Defense and specifically organized, trained, and equipped to conduct and support operations requiring unique modes of employment, tactical techniques, equipment and training often conducted in hostile, denied, or politically sensitive environments and characterized by one or more of the following: time sensitive, clandestine, low visibility, conducted with and/or through indigenous forces, requiring regional expertise, and/or a high degree of risk (U.S. Joint Chiefs of Staff 2011).

Static Range: a discrete range with fixed firing points or lanes, where individual or crew served weapons can be fired at designated targets, which may be fixed or moving between known points. Static ranges are often constructed using earthwork as backstops and lateral safety barriers. Personnel movement within a static range is strictly controlled, in contrast to the unscripted cross-country movement associated with LFAM ranges.

Surface Danger Zone: an area associated with a training range that is designed to protect people during weapons training. The SDZ may overlie land, water, and airspace. When a range is in active use, the SDZ is mathematically defined, strictly controlled exclusion area to contain projectiles, fragments, or components from firing, launching, or detonating weapons and explosives, either by direct fire or ricochet.

Sustainment Training: the repetitive execution of essential, previously mastered tasks. This training maintains skills and task performance at the required level of proficiency.

Tactical Ambush: in this training, a troop clandestinely enters the objective area, selects an ambush site, conceals itself, conducts surveillance and communications, and neutralizes the targeted force with live small arms fire and ordnance demolitions.

Tactical Ground Mobility: training consisting of personnel using vehicles (such as GMVs, (HMMWV, MRAP, or a new Narrow Vehicle alternative), to conduct extractions and insertions, reconnaissance, attacks on target locations, and bivouac.

Target Assaults: this training involves vehicle elements assaulting a target and securing an area with and without dismounted small arms fire.

Throughput: the number of personnel trained within a given period of time at a given location.

Tilt-Rotor Aircraft: an aircraft that uses a two or more powered rotors (sometimes called *proprotors*) mounted on rotating shafts at the end of a fixed-wing for lift and propulsion, and combines the vertical lift capability of a helicopter with the speed and range of a conventional fixed-wing aircraft (e.g., an MV-22).

Training Cadre: a nucleus or core group of personnel able to assume control and to train others.

Troop: a military unit subordinate to a squadron and headed by the troop leader.

Unmanned Aerial System: an aircraft without a human pilot on board.

UAS Training: in this training, a small element launches and/or communicates with a UAS launched elsewhere to gather intelligence over a specific area in support of FTXs, or for training in UAS operations.

Vehicle Insertion and Extraction: in the insertion phase, the vehicle(s) stops and personnel exit and unload vehicle(s), establish a security perimeter, and leave the insertion area to commence patrolling. In the extraction phase, the personnel have the additional tasks of communicating with the vehicle(s), marking the extraction site, and loading. This training may also include simulated ambushes and coordinated responses during the insertion and extraction.

APPENDIX A
PUBLIC AND AGENCY CORRESPONDENCE

UNITED STATES MARINE CORPS
MARINE CORPS AIR STATION YUMA
BOX 99100
YUMA, ARIZONA 85369-9100

5090
YRMD
May 16, 2013

Mr. Edward Smith
Chairman
Chemehuevi Indian Tribe
P.O. Box 1976
Havasu Lake, California 92363

SUBJECT: Initiation of Consultation for:
(A) Range Reconfiguration Project within Special Warfare Training Area (SWAT) Ranges 4 and 5 at the Chocolate Mountain Aerial Gunnery Range, Imperial and Riverside Counties, California and
(B) Establishment of Restricted Airspace in Support of Ground Training at the Chocolate Mountain Aerial Gunnery Range, Imperial and Riverside Counties, California

Dear Chairman Smith:

Under the National Historic Preservation Act (NHPA) Section 106, as codified in Title 36, Code of Federal Regulations Part 800 (36 CFR 800) Marine Corps Air Station (MCAS) Yuma is initiating consultation for a proposed undertaking, proposed action (A), located on lands within the Chocolate Mountain Aerial Gunnery Range (CMAGR) in Imperial and Riverside Counties, California. Marine Corps Air Station (MCAS) Yuma serves as the Federal manager for the CMAGR. In addition, MCAS Yuma would like to inform you of another proposed project, proposed action (B), which is not a Section 106 undertaking but might be of interest to our neighbors.

Proposed action (A) would involve the reconfiguration of range areas within SWAT Ranges 4 and 5 and include earth movement and construction of new range structures as well as the relocation of some range access roads. The project area is approximately 17,900 acres and is located in Township (T)8S/Range (R)13E/Sections 3-8,18,19, 28-34; T8S/R12E/Sections 1, 2, 9-16, 21-28, 34-36; T7S/R12E/Section 36; T7S/R13E/Sections 13,14, 21-29, 31-36; T7S/R14E/Sections 19, 30 of Riverside County and T9S/R12E/Sections 1,2,12; T9S/R13E/Sections 1-18, 20-27, 35, 36; T9S/R14E/Sections 7, 17-20, 28-34; T10S/R13E/Section 1; T10S/R14E/Sections 1-6, 8-16, 22-24, 25, 26; T10S/R15E/Sections 18,19 of Imperial County (Enclosures 1 and 2). The project lies entirely within the CMAGR.

Pursuant to 36 CFR § 800.4(b)(1), MCAS Yuma is in the process of making a reasonable and good faith effort to carry out appropriate identification efforts for historic properties in the vicinity of the proposed undertaking that may be affected by the proposed reconfiguration of existing ranges in SWAT Ranges 4 and 5 at CMAGR (Enclosures 1 and 2). The United States Marine Corps (USMC) requests your assistance in identifying places and/or practices that have traditional, religious, or cultural importance that you think could be affected by the proposed projects. We appreciate your input on this important matter and if you wish, arrangements can be made to visit the project area. As depicted in Enclosures 1 and 2, portions of the area of potential effect (APE) have been previously surveyed. Those areas of the APE that have not been surveyed within the last ten years, are within slopes less than 30 percent, and are located outside critical habitat for desert tortoise have been subjected to a recent 100 percent cultural resources survey. The results

of the survey may be mailed to your office when completed, upon your request. We anticipate this to be approximately mid-June, 2013.

Proposed action (B) would involve the establishment of Restricted Airspace above the western and northwestern portions of the CMAGR to support USMC and Naval Aviation and ground training requirements. The Federal Aviation Administration (FAA) is a Cooperating Agency on this proposal. The proposed Restricted Airspace, called R-2507W, would be located adjacent to the existing R-2507N and R-2507S, and would extend from the surface to 40,000 feet above ground level. R-2507W would encompass the majority of the existing Niland and Bombay Controlled Firing Areas (CFAs) (see Enclosure 3). Restricted Airspace is essentially an identified area in which the flight of aircraft, while not wholly prohibited, is subject to restrictions. No physical improvements, surface vehicle movement, or other ground-disturbing activity is proposed. If approved, the FAA would publish the Restricted Airspace area in the Federal Register and depict it on aeronautical charts.

As presented in Enclosure 3, the restricted airspace would cover approximately 48,000 acres in Township (T)7S/Range (R)12E/Sections 31-36; T7S/R13E/Sections 21-35; T7S/R14E/Section 19; T8S/R12E/Sections 1-6, 8-17, 21-27, 35-36; T8S/R13E/Sections 4-8, 19, 29-34; T9S/R12E/Sections 1-2, 12; T9S/R13E/Sections 2-18, 20-27, 35-36; T9S/R14E/Sections 18-19, 30-32; T10S/R14E/Sections 3-6, 8-11, 13-16, 22-26, 36; T10S/R15E/Sections 18-20; 28-34; T11S/R15E/Sections 2-5, 9-11 of Imperial and Riverside Counties.

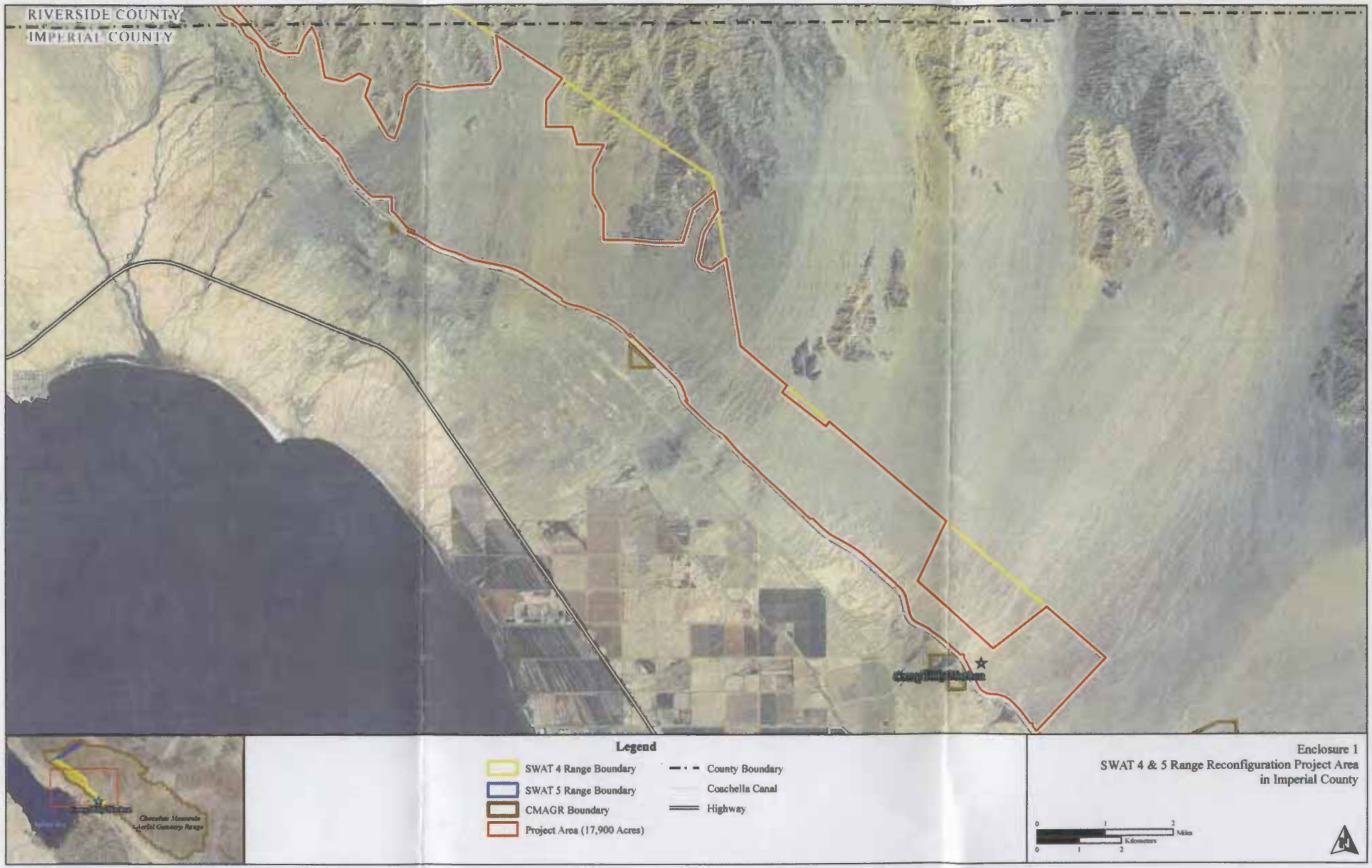
The USMC will be preparing Environmental Assessments for each proposed action, pursuant to the National Environmental Policy Act (NEPA), to assess the potential environmental effects of each project. The EA schedules have yet to be finalized; however, a draft EA for Proposed action (A) is anticipated to be available this fall. Meetings for discussing the alternatives and potential impacts for the Environmental Assessment will also be scheduled. Once the dates have been firmed up, an invitation will be sent to your office indicating the times and locations selected should you choose to participate in NEPA consultation. All comments received, and any specific issues expressed to the USMC, will be taken into consideration while planning for this undertaking.

The USMC respectfully requests your participation in the Section 106 and NEPA consultation for these proposed actions. Karla James, MCAS Yuma Archaeologist, will call you to follow up, answer any questions, and inquire if you would like a copy of the report. If you have any comments concerning properties of traditional, religious, and cultural significance in the vicinity of the APE or questions regarding consultation on this proposed project prior to her call, please contact Karla James, Archaeologist for MCAS Yuma, at (928) 269-2288; karla.james@usmc.mil.

Respectfully,

R. L. PEARCE
MCAS Yuma Range Management Director
By direction of the Commanding Officer

Enclosures: 1. SWAT 4 & 5 Range Reconfiguration Project Area in Imperial County
2. SWAT 4 & 5 Range Reconfiguration Project Area in Riverside County
3. Proposed Restricted Airspace



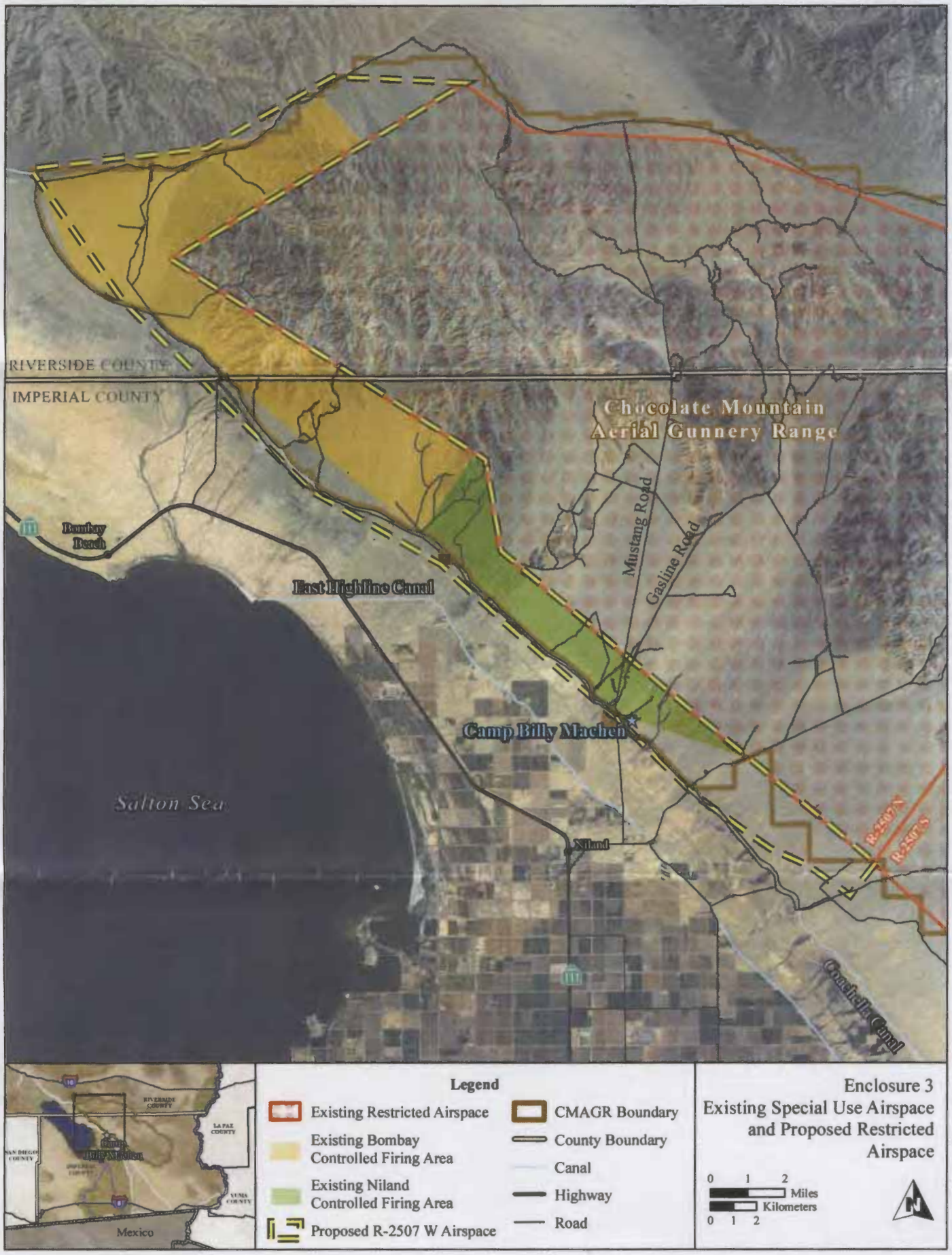
Enclosure 1
SWAT 4 & 5 Range Reconfiguration Project Area
in Imperial County

Legend

- SWAT 4 Range Boundary
- SWAT 5 Range Boundary
- CMAGR Boundary
- Project Area (17,900 Acres)
- County Boundary
- Coachella Canal
- Highway

Enclosure 2
SWAT 4 & 5 Range Reconfiguration Project Area
in Riverside County

0 1 2 Miles
0 1 2 Kilometers



Enclosure 3
Existing Special Use Airspace
and Proposed Restricted
Airspace

Title	First Name	Last Name	Suffix	Salutation	Job Title	Company	Address1	City	State	Postal Code
Mr.	Edward	Smith		Chairman	Chairman	Chemehuevi Indian Tribe	P.O. Box 1976	Havasu Lake	Californi	92363
Mr.	Ronald	Escobar		Mr.	Secretary Treasurer	Chemehuevi Indian Tribe	P.O. Box 1976	Havasu Lake	Californi	92363
Mr.	Wayne	Patch		Chairman	Chairman	Colorado River Indian Tribes	26600 Mohave Road	Parker	Arizona	85344
Ms.	Wilene	Fisher-Holt		Ms.	Director, Colorado River Indian Tribes	Colorado River Indian Tribes	26600 Mohave Road	Parker	Arizona	85344
Mr.	Darrell	Mike		Chairman	Chairman	Twenty Nine Palms Band of Mission Indians	46-200 Harrison Place	Coachella	California	92236
Mr.	William J.	Contreras		Mr.	Cultural Resources Coordinator	Torres-Martinez Desert Cahuilla Indians	P.O. Box 1160	Thermal	California	92274
Mr.	Richard	Milanovich		Chairman	Chairman	Agua Caliente Band of Cahuilla Indians	5401 Dinah Shore Drive	Palm Springs	California	92264
Mr.	Richard	Begay		Mr.	THPO	Agua Caliente Band of Cahuilla Indians	5401 Dinah Shore Drive	Palm Springs	California	92264
Mr.	Anthony	Madrigal		Chairman	Interim Chairman	Cahuilla Band of Mission Indians	P.O. Box 391760	Anza	California	92539
Ms.	Maryann	Martin		Chairwoman	Chairwoman	Augustine Band of Cahuilla Mission Indians	P.O. Box 846	Coachella	California	92236
Ms.	Karen	Kupcha		Ms.	Tribal Administrator	Augustine Band of Cahuilla Mission Indians	P.O. Box 846	Coachella	California	92236
Mr.	John	James		Chairman	Chairman	Cabazon Band of Mission Indians	84-245 Indio Springs Parkway	Indio	California	92203
Ms.	Judy	Stapp		Ms.	Director of Cultural Affairs	Cabazon Band of Mission Indians	84-245 Indio Springs Parkway	Indio	California	92203
Mr.	Robert	Martin		Chairman	Chairman	Morongo Band of Mission Indians	11581 Potrero Road	Banning	California	92220
Mr.	Joseph	Hamilton		Mr.	Representative	Ramona Band of Cahuilla Mission Indians	P.O. Box 39137	Anza	California	92539
Mr.	Anthony	Largo		Chairman	Chairman	Santa Rosa Band of Cahuilla Mission Indians	325 N. Western Avenue	Hemet	California	92543
Mr.	Paul	Cuero	, Jr.	Mr.	Vice-Chairman	Campo Kumeyaay Nation	36190 Church Road, Suite 5	Campo	California	91906
Mr.	Ron	Christman		Mr.		Kumeyaay Cultural Historic Committee	56 Viejas Grande Road	Alpine	California	92001
Ms.	Rhonda	Welch-Scalso		Chairwoman	Chairwoman	Barona Band of Mission Indians	1095 Barona Road	Lakeside	California	92040
Mr.	Harlan	Pinto	, Sr.	Chairman	Chairman	Ewiiaapaayp Tribal Office	P.O. Box 2250	Alpine	California	91903
Ms.	Rebecca	Osuna		Ms.	Spokesperson	Inaja Band of Mission Indians	309 S. Maple Street	Escondido	California	92025
Mr.	Leon	Acevedo		Chairman	Chairman	Jamul Band of Mission Indians	P.O. Box 612	Jamul	California	91935
Ms.	Carmen	Lucas		Ms.		Kwaaymii Laguna Band of Mission Indians	P.O. Box 775	Pine Valley	California	91962
Ms.	Gwendolyn	Parada		Chairwoman	Chairwoman	La Posta Band of Mission Indians	P.O. Box 1120	Boulevard	California	91905
Ms.	Catherine Siva	Saubel		Chairperson	Chairperson	Los Coyotes Band of Cahuilla and Cupeño Indians	P.O. Box 100	Warner Springs	California	92086
Mr.	Leroy J.	Elliott		Chairman	Chairman	Manzanita Band of Mission Indians	P.O. Box 1302	Boulevard	California	91905
Mr.	Mike	Linton		Chairman	Chairman	Mesa Grande Band of Mission Indians	P.O. Box 270	Santa Ysabel	California	92070
Mr.	Allen E.	Lawson		Chairman	Chairman	San Pasqual Band of Mission Indians	P.O. Box 365	Valley Center	California	92080
Mr.	Anthony R.	Pico		Chairperson	Chairperson	Viejas Band of Mission Indians	P.O. Box 908	Alpine	California	91903
Mr.	Johnny	Hernandez		Mr.	Spokesman	Santa Ysabel Band of Diegueno Indians	P.O. Box 130	Santa Ysabel	California	92070
Mr.	Danny	Tucker		Chairman	Chairman	Sycuan Band of Mission Indians	5459 Dehesa Road	El Cajon	California	92021
Mr.	Timothy	Williams		Chairman	Chairman	Fort Mojave Indian Tribe	500 Merriman Avenue	Needles	California	92363
Ms.	Linda	Otero		Ms.	Director, AhaMaKav Cultural Society	Fort Mojave Indian Tribe	P.O. Box 5990	Mohave Valley	Arizona	86440
Mr.	Keeny	Escalanti	, Sr.	President	President	Quechan Indian Tribe	P.O. Box 1899	Yuma	Arizona	85366
Ms.	Arlene	Kingery		Ms.	Historic Preservation Officer	Quechan Indian Tribe	P.O. Box 1899	Yuma	Arizona	85366
Ms.	Sherry	Cordova		Chairwoman	Chairwoman	Cocopah Indian Tribe	14515 S Veterans Dr.	Somerton	Arizona	85350
Ms.	Jill	McCormick		Ms.	Cultural Resources Manager	Cocopah Indian Tribe	14515 S Veterans Dr.	Somerton	Arizona	85350
Mr.	Deron	Marquez		Chairman	Chairman	San Manuel Band of Mission Indians	26569 Community Center Drive	Highland	California	92346
Mr.	Ned	Norris	, Jr.	Chairman	Chairman	Tohono O'Odham Nation	P.O. Box 837	Sells	Arizona	85634
Mr.	Peter	Steere		Mr.	Tribal Historic Preservation Officer	Tohono O'Odham Nation	P.O. Box 837	Sells	Arizona	85634
Mr.	Louis J.	Manuel	, Jr.	Chairman	Chairman	Ak-Chin Indian Community	42507 W. Peters and Nall Road	Maricopa	Arizona	85138
Ms.	Caroline	Antone		Ms.	Cultural Resources Manager	Ak-Chin Indian Community	42507 W. Peters and Nall Road	Maricopa	Arizona	85138
Mr.	Gregory	Mendoza		Governor	Governor	Gila River Indian Community	P.O. Box 97	Sacaton	Arizona	85247
Mr.	Barnaby V.	Lewis		Mr.	Tribal Historic Preservation Officer	Gila River Indian Community	P.O. Box 2140	Sacaton	Arizona	85247
Ms.	Diane	Enos		Chairwoman	Chairwoman	Salt River Pima-Maricopa Indian Community	10005 East Osborn Road	Scottsdale	Arizona	85256
Mr.	Kelly	Washington		Mr.	Cultural Resources Department Director	Salt River Pima-Maricopa Indian Community	10005 East Osborn Road	Scottsdale	Arizona	85256

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
1725 23rd Street, Suite 100
SACRAMENTO, CA 95816-7100
(916) 445-7000 Fax: (916) 445-7053
calshpo@parks.ca.gov
www.ohp.parks.ca.gov

April 03, 2014 In reply refer to: USMC_2014_0226_001

R.L. Pearce
United States Marine Corps
Marine Corps Station Yuma
Box 99100
Yuma, AZ 85369-9100

Re: Section 106 Eligibility Determination for Archaeological Sites recorded for the Range Reconfiguration Project within Special Warfare Training Area (SWAT) Ranges 4 and 5 at the Chocolate Mountain Aerial Gunnery Range, Imperial and Riverside Counties, California.

Dear Mr. Pearce:

Thank you for your letter dated February 18, 2014 requesting my review and comment with regard to the proposed undertaking of Range Reconfiguration at the Special Warfare Training Area (SWAT) Ranges 4 and 5 at the Chocolate Mountain Aerial Gunnery Range. The U.S. Marine Corps (USMC) Air Station Yuma is consulting with me Pursuant to 36 CFR Part 800 (as amended 8-05-04) regulations implementing Section 106 of the National Historic Preservation Act. Along with your consultation letter, you also provided the following report:

- *Cultural Resource Survey Special Warfare Training Areas 4 and 5 Chocolate Mountain Aerial Gunnery Range, Imperial and Riverside Counties, California.* (Cardno Tec 2013).

The USMC Air Station Yuma proposes to reconfigure the majority of range areas within SWAT 4 and 5 in order to maximize training benefits now and into the future. Though the preferred alternative has not yet been developed, the entire Area of Potential Effects for both ranges was subjected to a records search and a pedestrian survey for cultural resources by Cardno Tec for an area totaling approximately 22,400 acres. Approximately 8,000 acres with slopes greater than 30 percent were not surveyed for safety reasons and 1,500 acres were not surveyed due to their location within a critical habitat for the desert tortoise that is not slated for inclusion in the proposed undertaking at this time.

The survey resulted in the recordation of 17 newly identified sites and 21 isolates. Additionally, 18 previously recorded sites were revisited and rerecorded. One previously recorded site (P-13-011467) was not able to be relocated during the survey, and based on the site record it does not appear to meet the California State definition of an archaeological site. A number of previously recorded trails were determined to be naturally formed by migrating wildlife and are no longer considered cultural resources. The recorded sites are predominately prehistoric and consist of seven rock and cleared circles or rings, 10 trails, three small lithic scatters, one rock alignment, two rock art complexes, and isolated artifacts (pottery and obsidian). Eleven historic sites were recorded, including portions of a railroad, water control features associated with a canal, three roads, four can scatters, two quarries and one rock art site. Isolated occurrences of tobacco and tin cans are scattered throughout the project area. Site density was recorded as very low, about one site per 390 acres. Based on the evaluations performed by Cardno Tec, the USMC has made eligibility determination on 29 of the 53 sites within the APE, finding 2 eligible and 27 not eligible for listing on the National Register of Historic Places (NRHP). The other 24 sites will be assumed eligible and treated accordingly, unless project changes create a need to evaluate these resources. The two sites that have been determined eligible include a petroglyph site (P-13-04395) and a rock art site including a trail, cremated bone, cleared areas, rock cairns, and a fire ring (P-33-02640). The sites that have been determined ineligible for listing on NRHP include roads that were determined to be of modern military creation and use, historic can and trash scatters or dumps that do not retain sufficient integrity due to environmental or military disturbances and do not provide sufficient

information on history in the area, and a historic road complex that lacks integrity due to the destruction and alterations of the majority of the roads caused by outwash and military activities.

The USMC initiated consultation with the Native American Heritage Commission (NAHC) and the list of tribal contacts provided by the NAHC in May, 2013. All tribes that expressed interest were sent PDF or paper copies of the survey and evaluation report prepared by Cardno Tec. and a site visit was conducted at the request of the Kwaaymii Laguna Band of Mission Indians (KLBMI) on January 21, 2014. The site visit included a visit to CA-RIV-2640/ P-33-02640. Ms. Carmen Lucas from the KLBMI had previously visited this site about ten years ago and expressed that it has been impacted by pedestrian and military traffic since that visit. She requested that the site be protected, and at the very least a cyclone fence should be erected around the site to reduce human impacts.

The USMC Air Station Yuma is requesting my concurrence with their eligibility determinations for archaeological sites within the APE for the proposed undertaking. Once the proposed range reconfiguration layout is finalized, they will begin consultation with the tribes and my office concerning the potential effects to historic properties based on these determinations of eligibility. After reviewing the documentation submitted to this office, I offer the following comments:

- Pursuant to 36 CFR 800.4(c), I concur with your determination that P-13-04395 and P-33-02640 are eligible for listing on the National Register of Historic Places under Criterion D, however, I would recommend that the USMC reconsider their evaluation of both sites under the other three criteria for eligibility, especially under Criterion A and Criterion C.
- Pursuant to 36 CFR 800.4(c) I concur with your determination that the following sites are not eligible for listing on the National Register of Historic Places under any of the criteria:
    - Historic roads P-13-012585, P-13-013561
    - Historic artifact scatters CA-IMP-12188, CA-IMP-12196, CA-RIV-11578, and CA-RIV-11579.
    - Historic road complex P-13-014651/CA-RIV-11686.
    - Historic Rock Quarry CA-RIV-9402
- Pursuant to 36 CFR 800.4(c) I concur with your determination that the following trails are not eligible for listing on the National Register of Historic Places under any of the criteria:
    - CA-IMP-10385, CA-IMP11067, CA-IMP-11072, CA-IMP-11073, CA-IMP-11074, CA-IMP-11075, CA-IMP-11076, CA-IMP-11092, CA-IMP-11093, CA-IMP-9401.

I look forward to continuing this consultation once the USMC has determined the range reconfiguration layout. Thank you for seeking my comments and considering historic properties as part of your project planning. If you have any questions, please contact Jessica Tudor of my staff at (916) 445-7016 or jessica.tudor@parks.ca.gov.or Ed Carroll of my staff at (916) 445-7006 or Ed.Carroll@parks.ca.gov.

Sincerely,

Carol Roland-Nawi, Ph.D.

Carol Roland-Nawi, PhD
State Historic Preservation Officer

Preserving America's Heritage

April 17, 2015

Mr. William R. Sellers
Director, Range Management
Marine Corps Air Station Yuma
Box 99100
Yuma, AZ 85369-9100

Ref: Proposed Range Reconfiguration within Special Warfare Training Area Ranges 4 and 5 Marine Corps Air Station Yuma, California

Dear Mr. Sellers:

The Advisory Council on Historic Preservation (ACHP) recently received the additional information in support of your notification of adverse effects of the referenced undertaking on properties listed on and eligible for listing in the National Register of Historic Places. Based upon the information you provided, we have concluded that Appendix A, *Criteria for Council Involvement in Reviewing Individual Section 106 Cases,* of our regulations, "Protection of Historic Properties" (36 CFR Part 800) does not apply to this undertaking. Accordingly, we do not believe that our participation in the consultation to resolve adverse effects is needed. However, if we receive a request for participation from the State Historic Preservation Officer, Tribal Historic Preservation Officer, or another party, we may reconsider this decision. Additionally, should circumstances change, and you determine that our participation is needed to conclude the consultation process, please notify us.

Pursuant to 36 CFR 800.6(b)(1)(iv), you will need to file the final Programmatic Agreement (PA), developed in consultation with the California State Historic Preservation Officer (SHPO) and any other consulting parties, and related documentation with the ACHP at the conclusion of the consultation process. The filing of the Agreement and supporting documentation with the ACHP is required in order to complete the requirements of Section 106 of the National Historic Preservation Act.

Thank you for providing us with your notification of adverse effect. If you have any questions or require further assistance, please contact Katharine Kerr at 202-517-0216, or via email at kkerr@achp.gov.

Sincerely,

Raymond V. Wallace

Raymond V. Wallace
Historic Preservation Technician
Office of Federal Agency Programs

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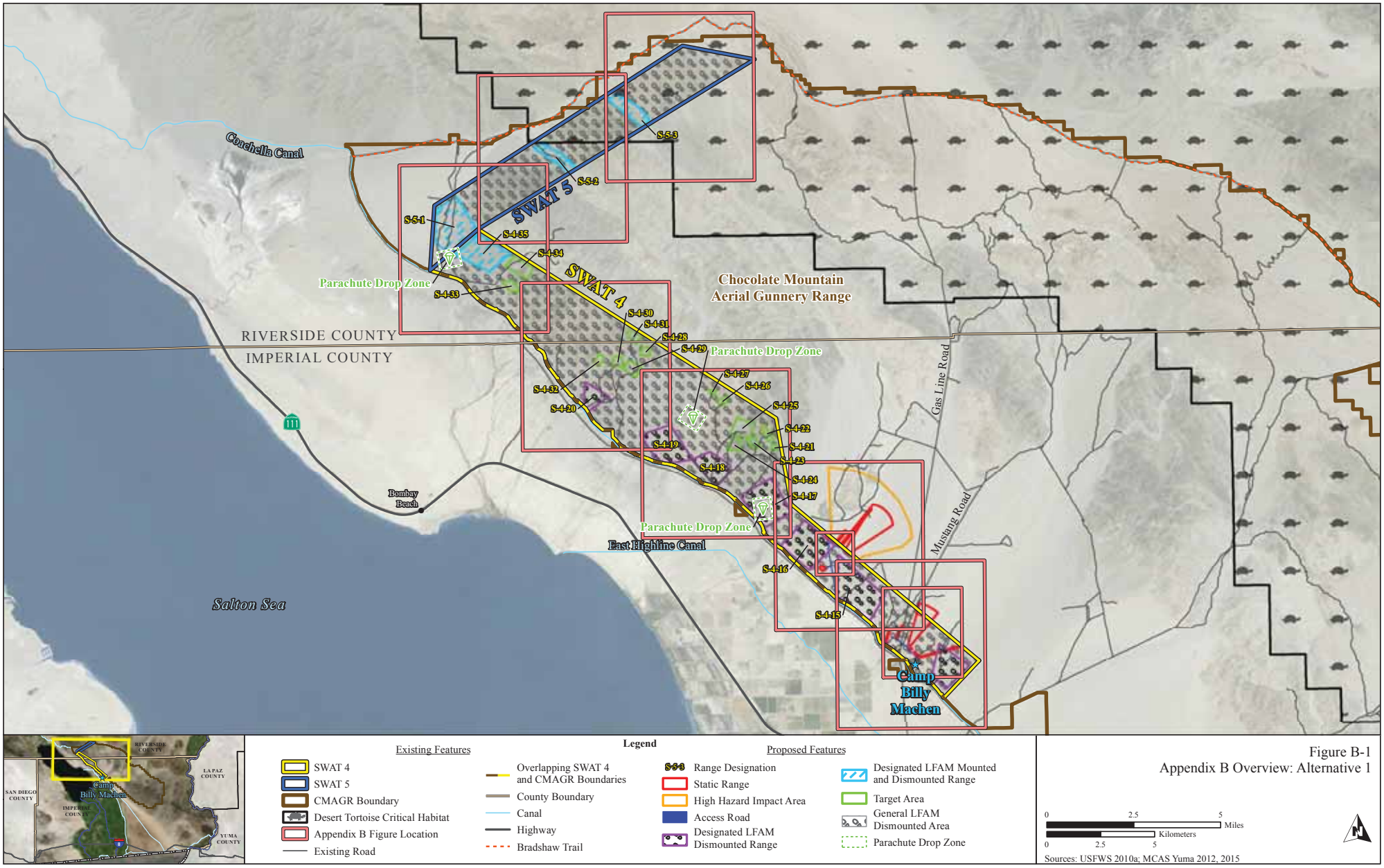
APPENDIX B
DETAILED MAPS OF ALTERNATIVE 1



Legend

Existing Features

- SWAT 4
- SWAT 5
- CMAGR Boundary
- Desert Tortoise Critical Habitat
- Appendix B Figure Location
- Existing Road
- Overlapping SWAT 4 and CMAGR Boundaries
- County Boundary
- Canal
- Highway
- Bradshaw Trail

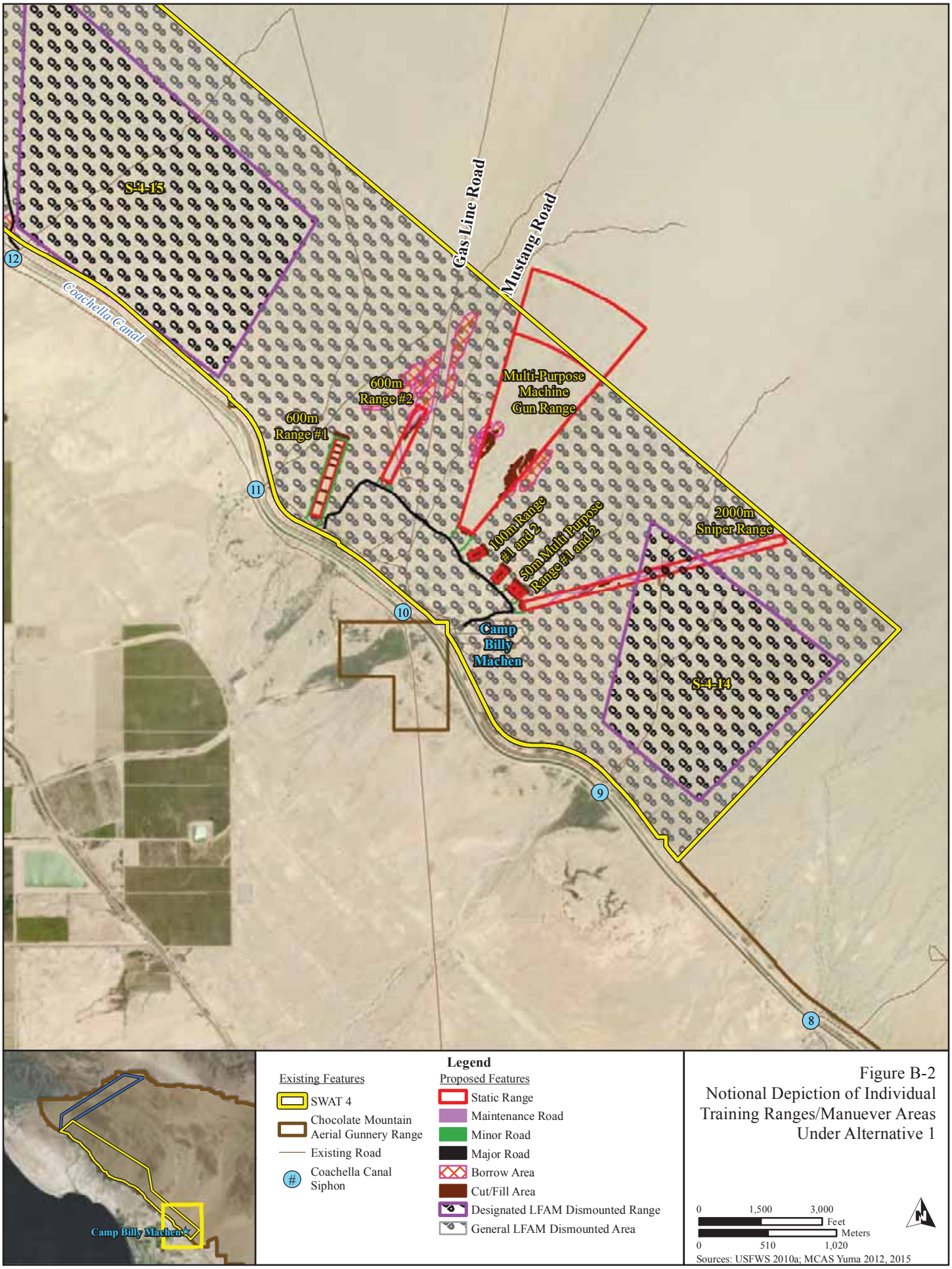
Proposed Features

- S-3-8 Range Designation
- Static Range
- High Hazard Impact Area
- Access Road
- Designated LFAM Dismounted Range
- Designated LFAM Mounted and Dismounted Range
- Target Area
- General LFAM Dismounted Area
- Parachute Drop Zone

Figure B-1
Appendix B Overview: Alternative 1

0 2.5 5 Miles
0 2.5 5 Kilometers

Sources: USFWS 2010a; MCAS Yuma 2012, 2015



Sources: USFWS 2010a; MCAS Yuma 2012, 2015

Figure B-2
Notional Depiction of Individual Training Ranges/Manuever Areas Under Alternative 1

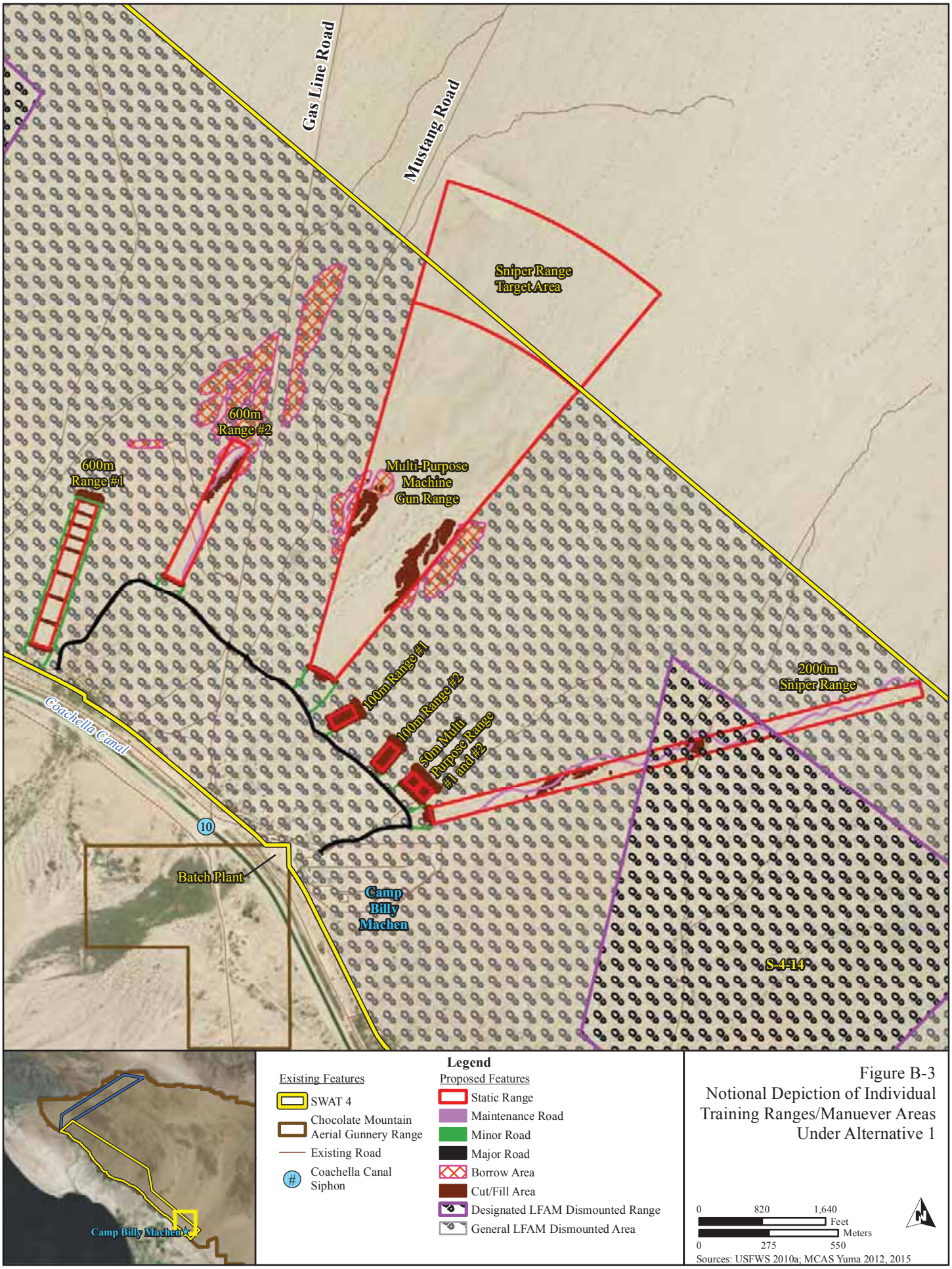


Figure B-3
Notional Depiction of Individual Training Ranges/Manuever Areas Under Alternative 1

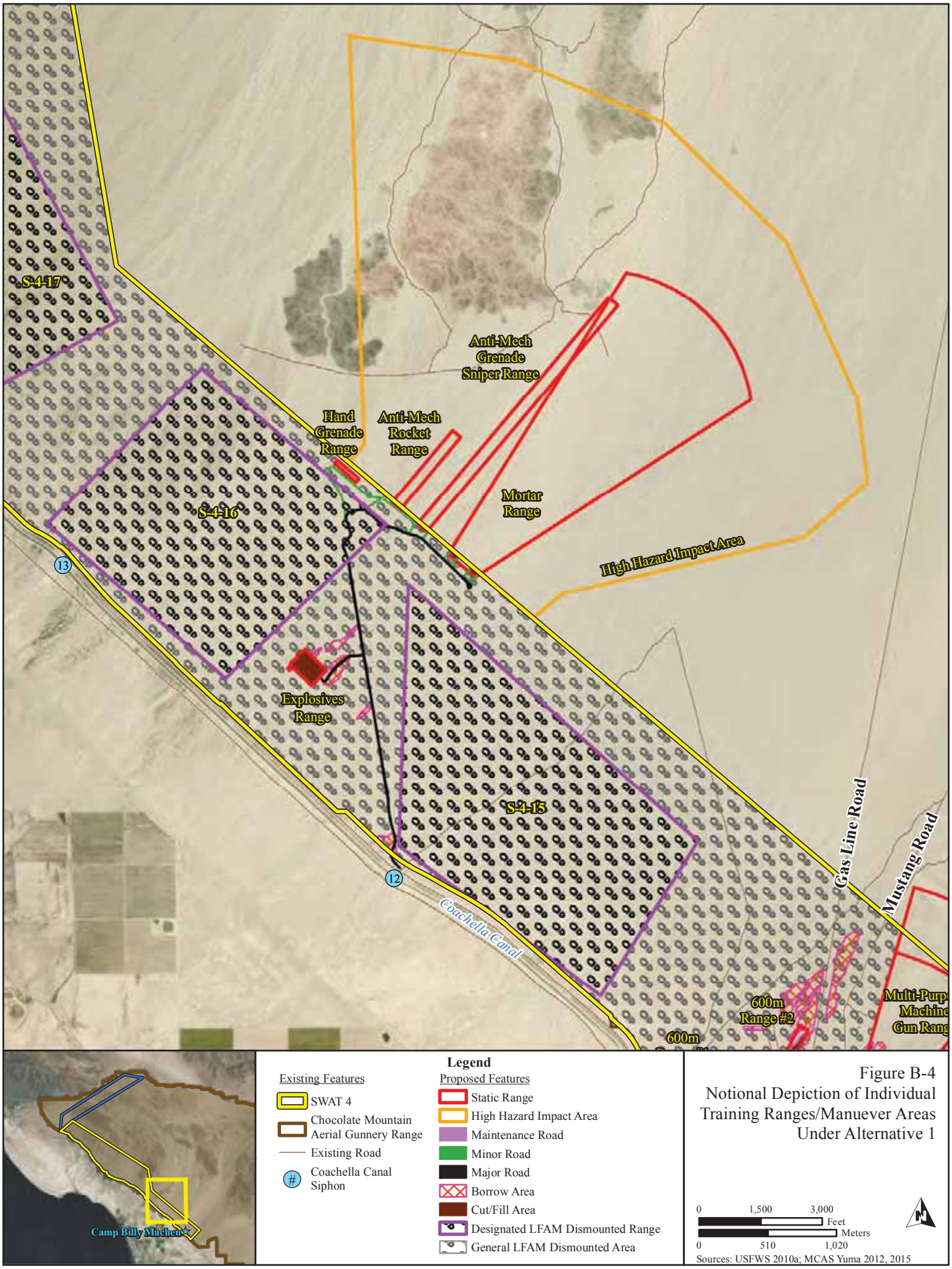
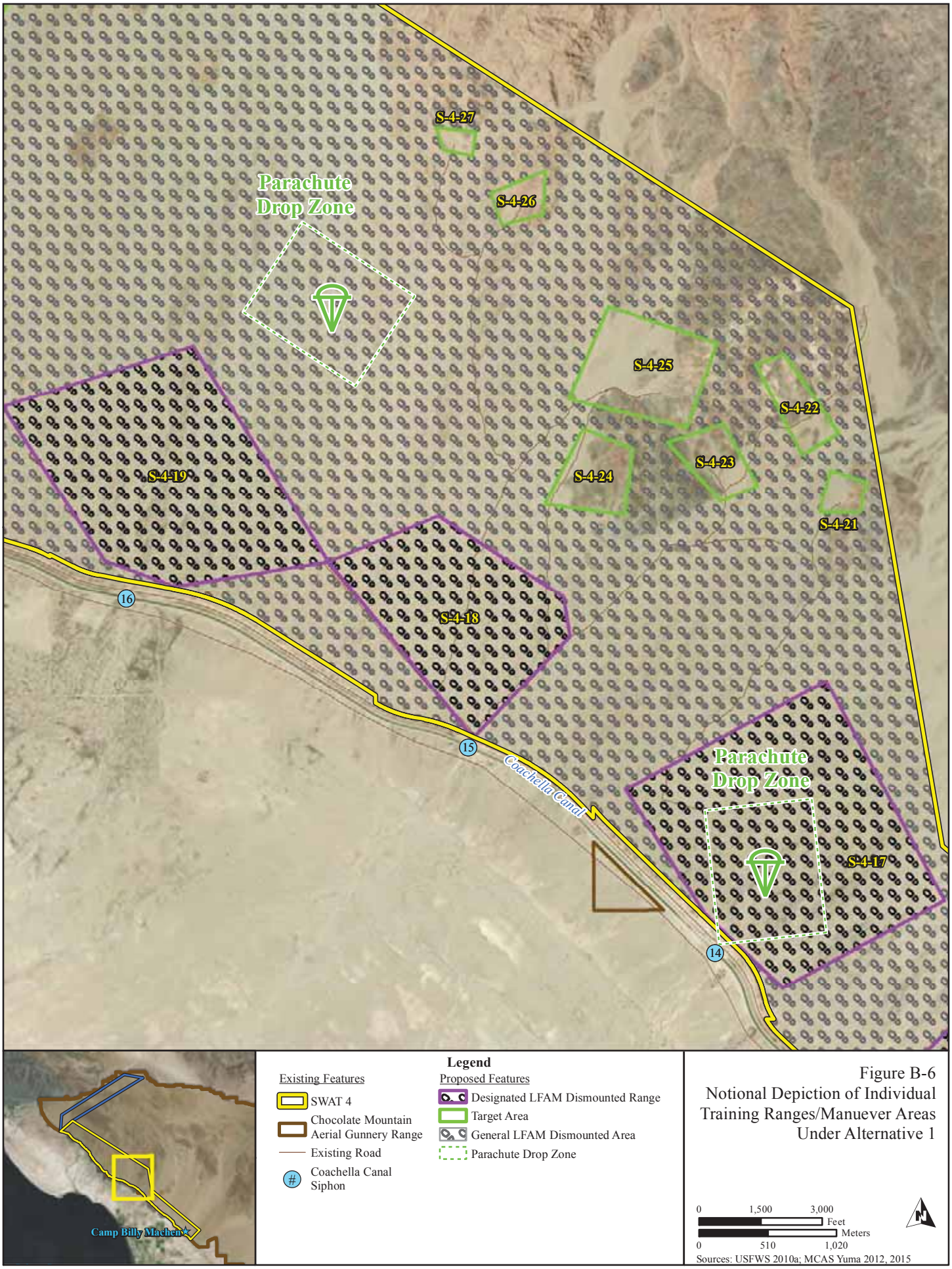


Figure B-4
Notional Depiction of Individual Training Ranges/Manuever Areas Under Alternative 1

Figure B-5
Notional Depiction of Individual Training Ranges/Manuever Areas Under Alternative 1

Sources: USFWS 2010a; MCAS Yuma 2012, 2015



Sources: USFWS 2010a; MCAS Yuma 2012, 2015

Figure B-6
Notional Depiction of Individual Training Ranges/Manuever Areas Under Alternative 1

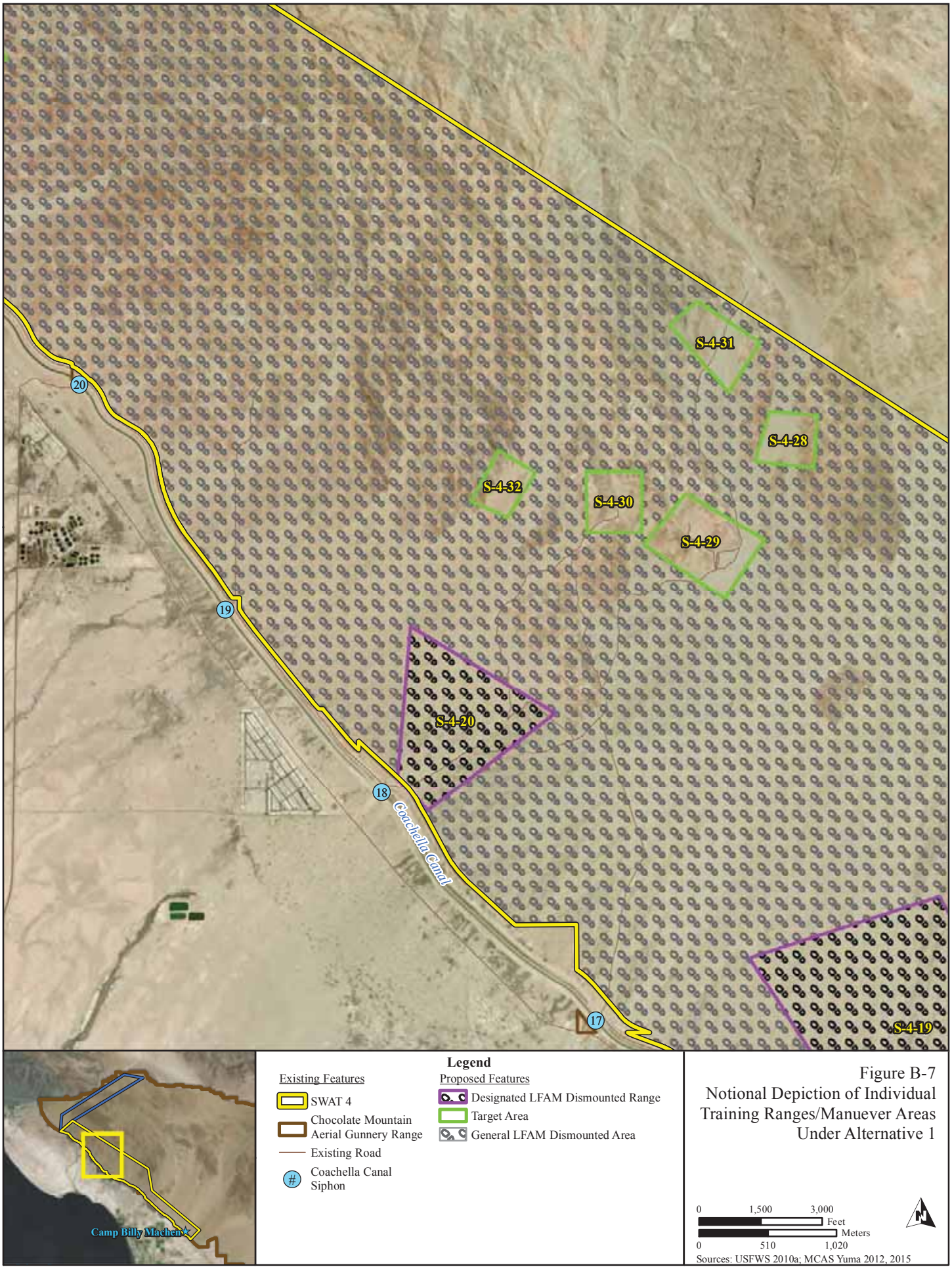


Figure B-7
Notional Depiction of Individual Training Ranges/Manuever Areas Under Alternative 1

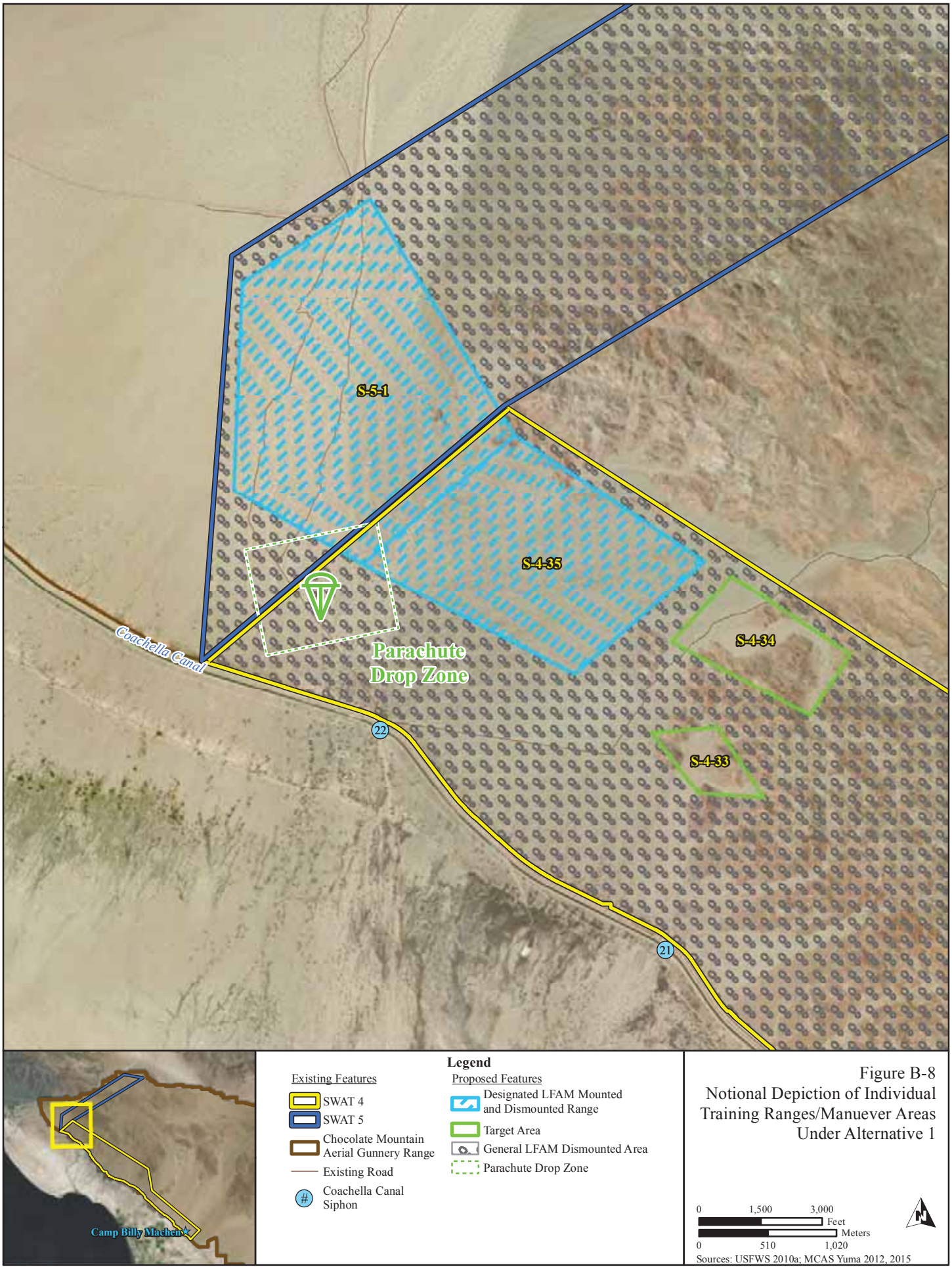


Figure B-8
Notional Depiction of Individual Training Ranges/Manuever Areas Under Alternative 1

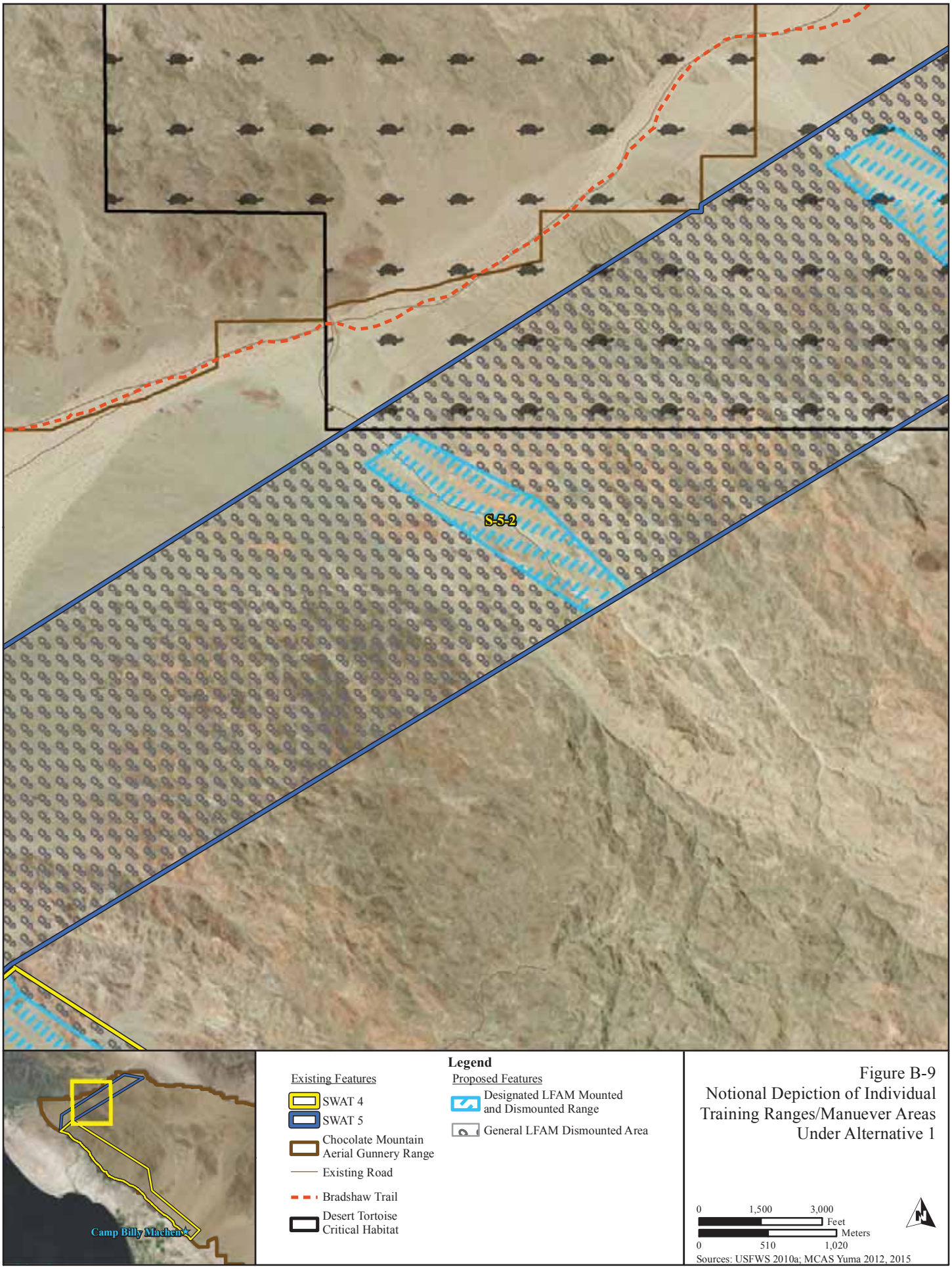


Figure B-9
Notional Depiction of Individual Training Ranges/Manuever Areas Under Alternative 1

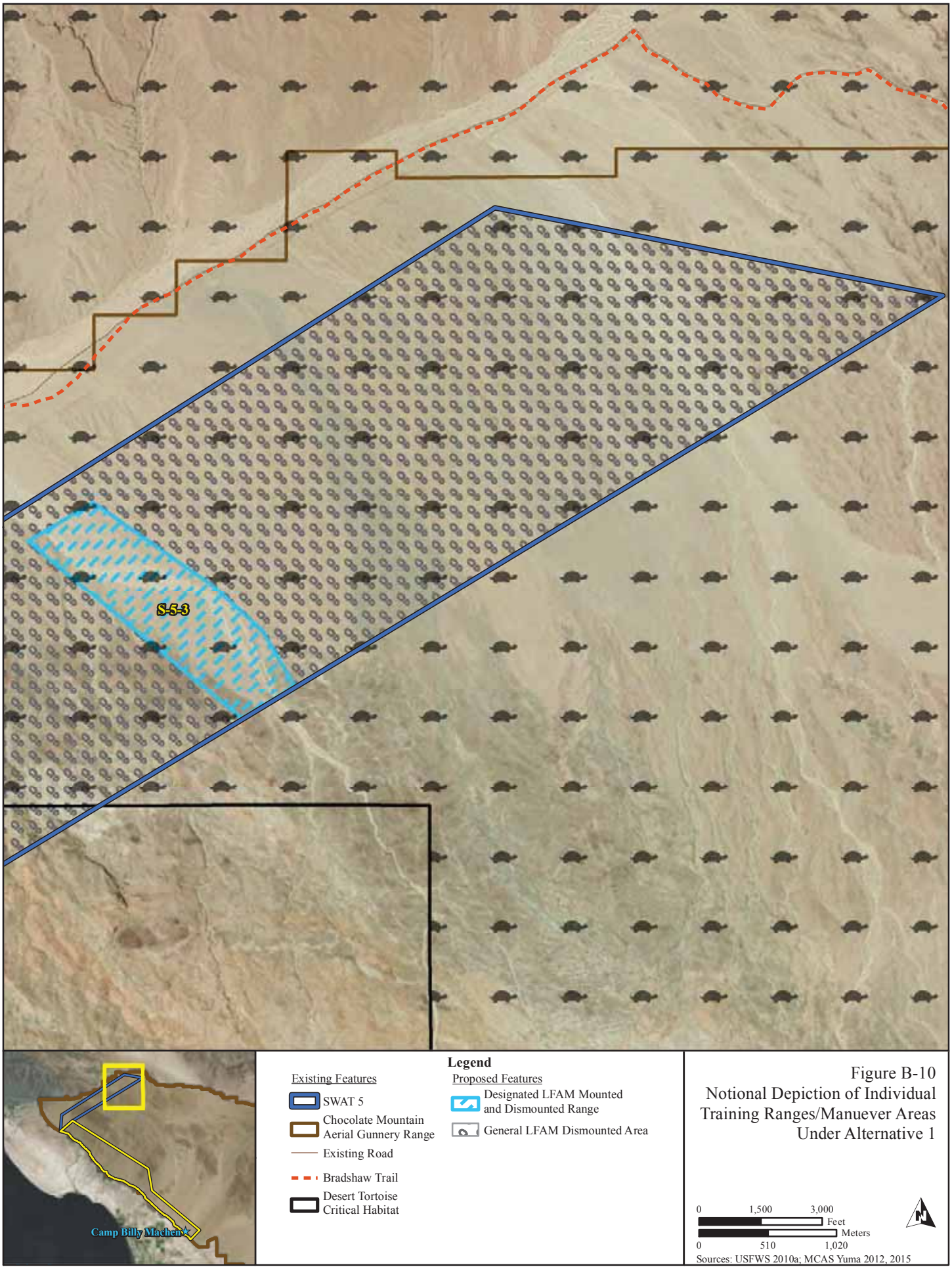


Figure B-10
Notional Depiction of Individual Training Ranges/Manuever Areas Under Alternative 1

Sources: USFWS 2010a; MCAS Yuma 2012, 2015

APPENDIX C
PRELIMINARY DESIGN DRAWINGS OF PROPOSED RANGE INFRASTRUCTURE (*COMMON TO ALTERNATIVES 1 AND 2*)

GMHA, 201309

REVISION 12-08-14

TRAINING RANGE PROJECT
SPECIAL WAREFARE AREA OF TRAINING (SWAT) #4 AND #5

CHOCOLATE MOUNTAIN AERIAL GUNNER RANGE, CALIFORNIA

SUBMITTAL INFORMATION

35% CONCEPT DRAWINGS

N62473-11-D-0003

DRAWINGS SHEET INDEX

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C-100.1	GRADING PLAN INDEX SHEET
C-100.2	GRADING PLAN INDEX SHEET
C-101	HAND GRENADE RANGE, GRADING PLAN
C-102	ANTI-MECH ROCKET RANGE GRADING PLAN
C-103	ANTI-MECH GRENADE / UNKNOWN DISTANCE SNIPER RANGE, GRADING PLAN
C-104	MORTAR RANGE, GRADING PLAN
C-105.1	EXPLOSIVES RANGE, GRADING PLAN
C-105.2	EXPLOSIVES RANGE, CROSS SECTION
C-106	600M KNOWN DISTANCE RANGE, GRADING PLAN
C-107	600M KNOWN DISTANCE RANGE, GRADING PLAN
C-108	600M UNKNOWN DISTANCE RANGE, GRADING PLAN
C-109	600M UNKNOWN DISTANCE RANGE, GRADING PLAN
C-110	MULTI-PURPOSE MACHINE GUN RANGE, GRADING PLAN
C-111.1	50M SAR 1 & 2 RANGE, GRADING PLAN
C-111.2	50M SAR 1 & 2 RANGE, CROSS SECTION
C-112	100M SAR 1 RANGE, GRADING PLAN
C-113.1	100M SAR 2 RANGE, GRADING PLAN
C-113.2	100M SAR 2 RANGE, CROSS SECTION
C-114	2000M KNOWN DISTANCE SNIPER RANGE, GRADING PLAN
C-115	CROSS & OVER CROSSING OF THE BOR BERM
A-100.1	ARCHITECTURAL SITE PLAN
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A-101	SNIPER TOWER FLOOR PLANS, ELEVATIONS & SECTION
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A-103	600M KNOWN AND UNKNOWN DISTANCE RANGES
A-104	MULTI-PURPOSE MACHINE GUN AND 50M SAR #1 & #2 RANGES
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A-106	TARGET / STORAGE SHED AND EXPLOSIVE RANGE
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SYM	DESCRIPTION	DATE	APPR
1	X	00/00/00	X

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NAVAL SPECIAL WAREFARE COMMAND CORONADO, CA
NAVAL AMPHIBIOUS BASE NILAND, CA
SPECIAL WARFARE AREA TRAINING 4 & 5
TRAINING RANGE PROJECT
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE
DRAWINGS SHEET INDEX

SCALE: AS NOTED

EFPROJECT NO.: X

CONSTR. CONTR. NO. X

NAVFAC DRAWING NO.

SHEET X OF X

T-1

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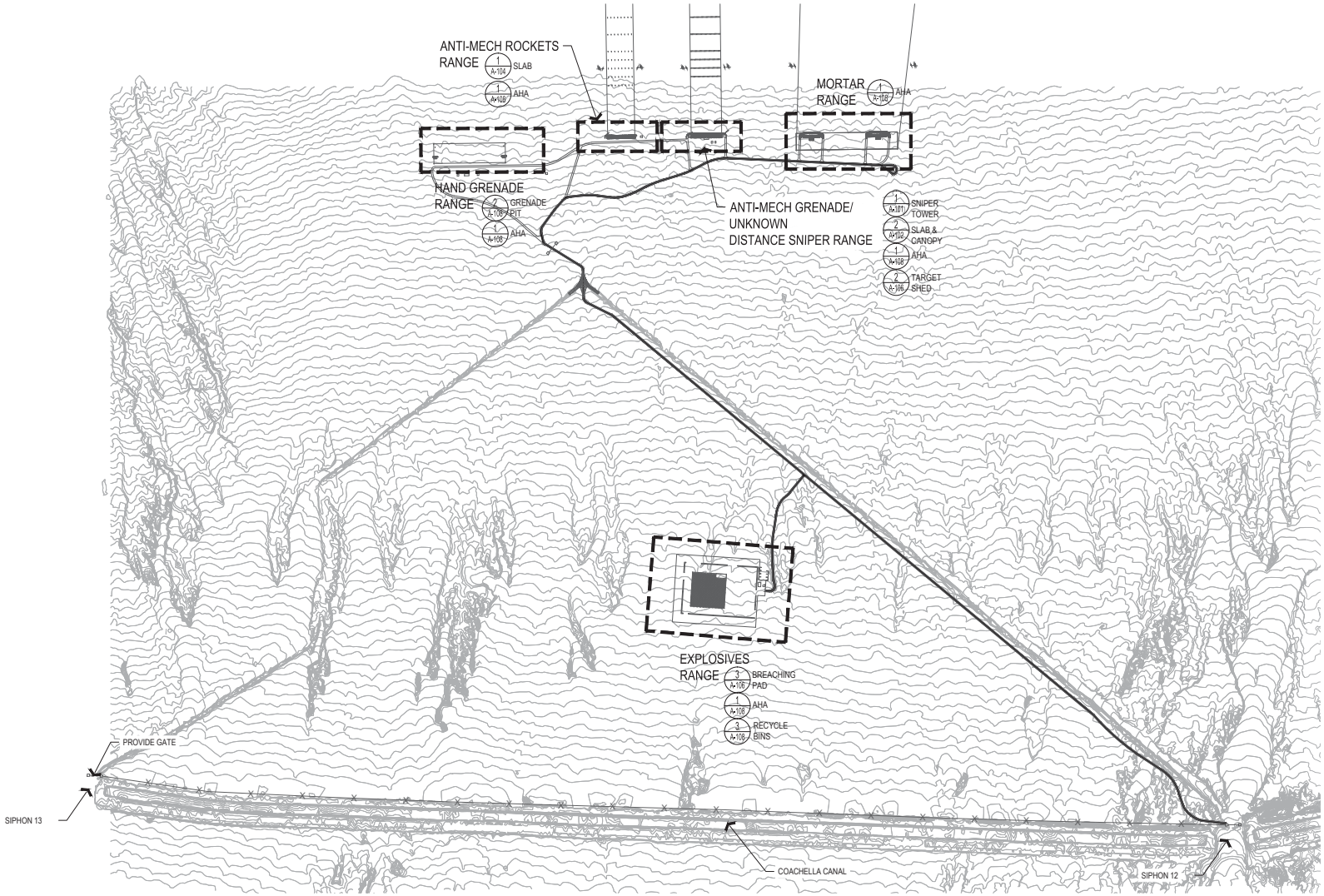

1 ARCHITECTURAL SITE PLAN

SCALE: 1" = 500'

500 250 0 500 1000 1500

SCALE: 1"=500'

NOTES

1 FOR BUILDING FOOTPRINT AND SITE CONDITIONS, SEE CIVIL DRAWINGS C-100.1 AND C-100.2

SCALE: 1"=500'

SYM	DESCRIPTION	DATE	APPR
1	X	00/00/00	X

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DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
NAVAL AMPHIBIOUS BASE CORONADO, CA
SPECIAL WARFARE AREA TRAINING 4 & 5 NILAND, CA
NAVAL SPECIAL WAREFARE COMMAND

TRAINING RANGE PROJECT
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE

ARCHITECTURAL SITE PLAN

SCALE: AS NOTED

EPROJECT NO.: X

CONSTR. CONTR. NO. X

NAVFAC DRAWING NO.

SHEET X OF X

A-100.1

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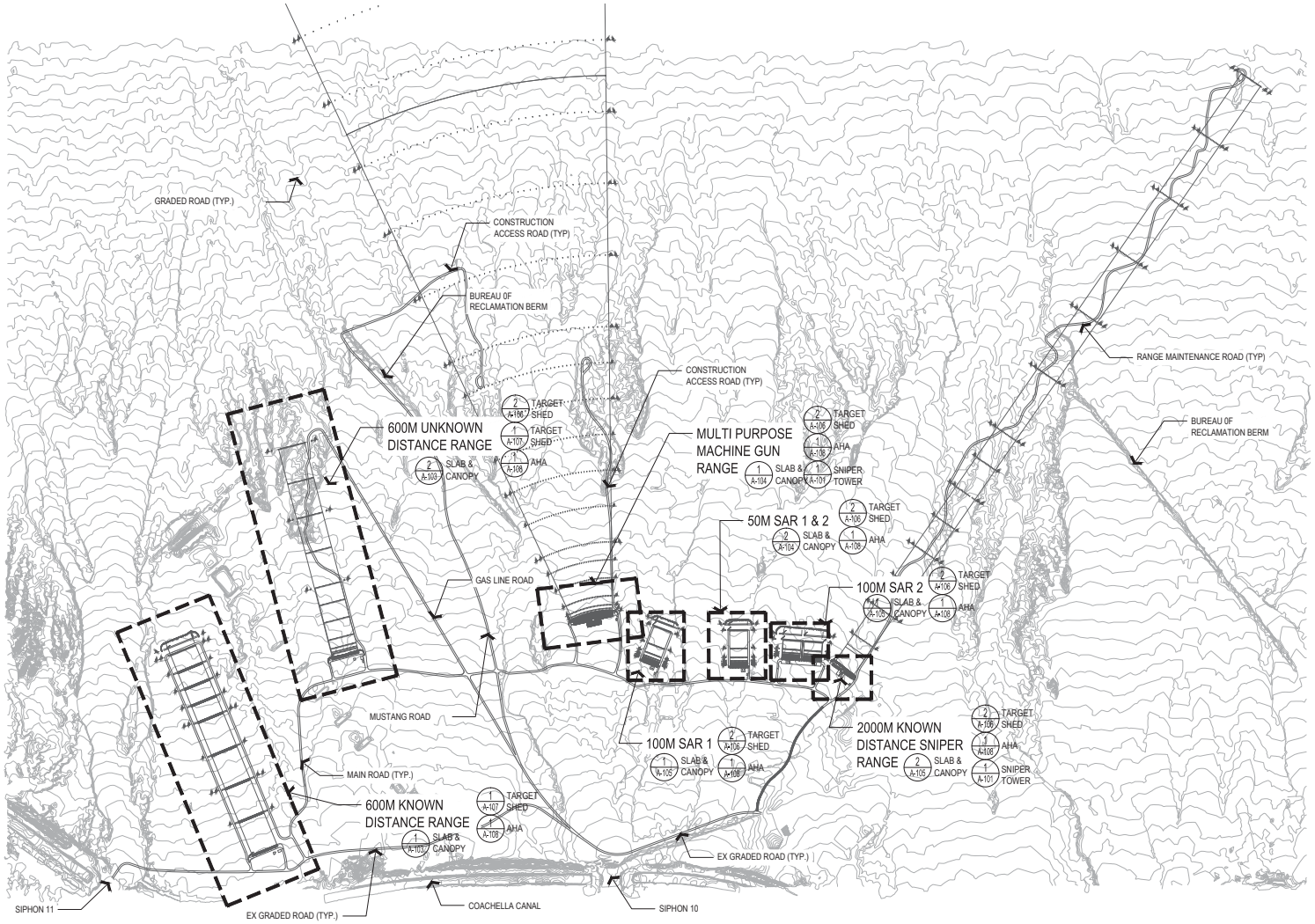

1 ARCHITECTURAL SITE PLAN

SCALE: 1" = 500'

500 250 0 500 1000 1500

SCALE: 1"=500'

NOTES

1 FOR BUILDING FOOTPRINT AND SITE CONDITIONS, SEE CIVIL DRAWINGS C-100.1 AND C-100.2

SCALE: 1"=500'

SYM	DESCRIPTION	DATE	APPR
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GOV PPE XX

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CORONADO, CA
NAVAL AMPHIBIOUS BASE
SPECIAL WARFARE AREA TRAINING 4 & 5
NILAND, CA

TRAINING RANGE PROJECT
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE

ARCHITECTURAL SITE PLAN

SCALE: AS NOTED

EPROJECT NO.: X

CONSTR. CONTR. NO. X

NAVFAC DRAWING NO.

SHEET X OF X

A-100.2

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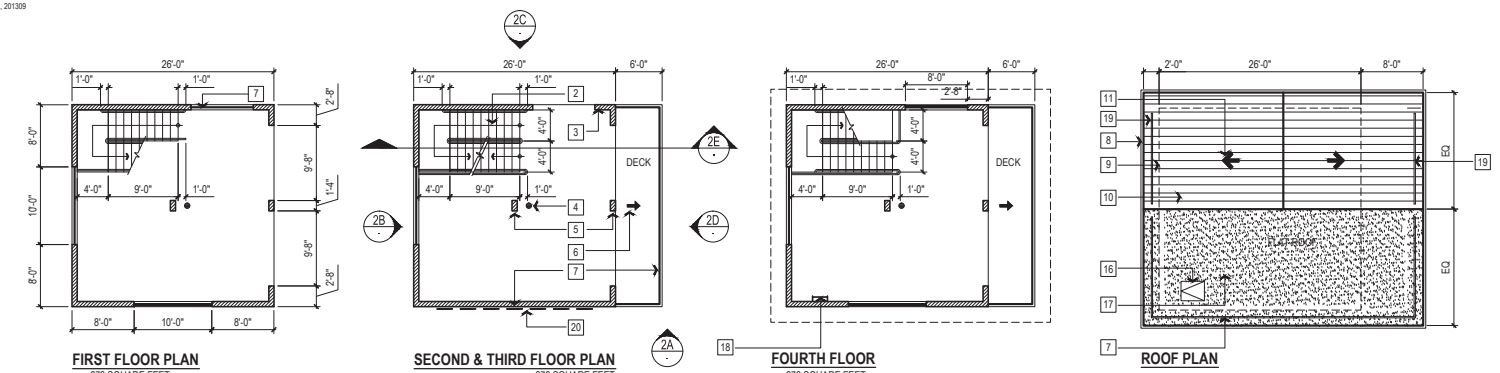


FIRST FLOOR PLAN
676 SQUARE FEET

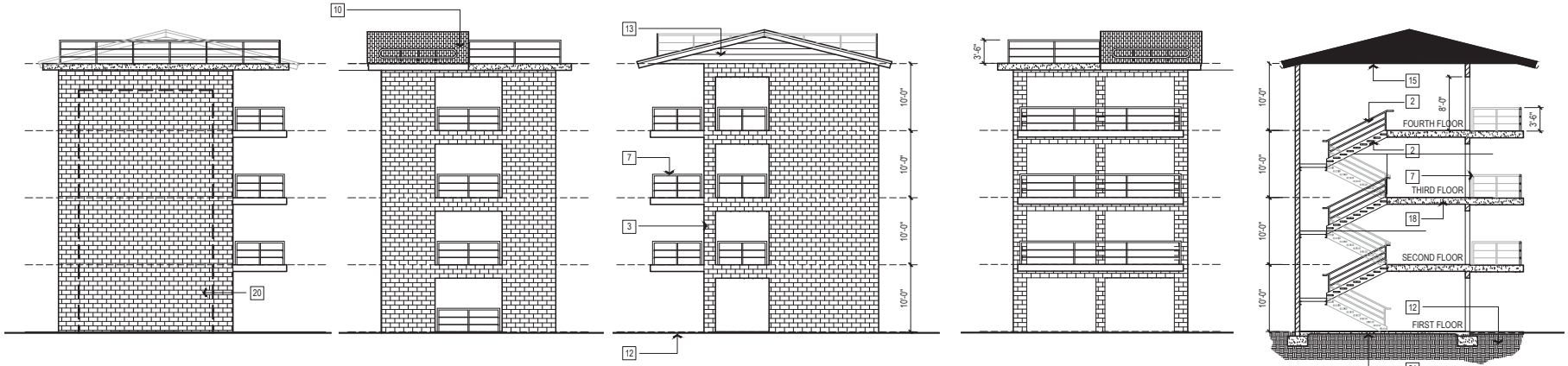
SECOND & THIRD FLOOR PLAN
676 SQUARE FEET
156 SQUARE FEET (DECK)

FOURTH FLOOR
676 SQUARE FEET
156 SQUARE FEET (DECK)

ROOF PLAN

1 SNIPER TOWER FLOOR PLANS AND ROOF PLAN

1/8 "=1'-0" 0 4' 8' 12'



A ELEVATION

B ELEVATION

C ELEVATION

D ELEVATION

E SECTION

2 SNIPER TOWER EXTERIOR ELEVATIONS AND SECTION

1/8 "=1'-0" 0 4' 8' 12'

KEYNOTES X

KEYNOTES ARE CONSIDERED "TYPICAL" UON AND IS TO BE APPLIED TO EVERY SIMILAR CONDITION WHETHER OR NOT THE REFERENCE KEYNOTE IS REPEATED

1 FLUSH HOLLOW EXTRA HEAVY DUTY METAL DOOR AND 16 GA FRAME, GROUTED. HARDWARE: 1-1/2 BUTTS, THRESHOLD, WEATHER STRIPPING, AUTO-CLOSURE, LOCKSET, SHOE WITH RAIN DRIP AND OVERHEAD RAIN DRIP

2 PREFABRICATED GALVANIZED STEEL STAIR SYSTEM INCLUDING LANDING AND RAILING.

3 REINFORCED GROUTED CONCRETE MASONRY WALL

4 AREA FLOOR DRAIN

5 INTERIOR REINFORCED GROUTED CONCRETE MASONRY INTERMEDIATE SUPPORT

6 SLOPE DECK MIN. 1/4":12"

7 REMOVABLE 42" HIGH RAILING WITH TUB STEEL SUPPORTS AND TOP RAIL WITH 1/4" STAINLESS STEEL CABLE RAILING SYSTEM

8 EAVE GUTTER

9 PERIMETER CMU WALL BELOW

10 ASPHALT SHINGLES OVER 2" OF RIGID INSULATION

11 ROOF SLOPE 3":12"

12 SITE GRADE

13 PRE=FINISHED METAL SIDING

14 OUTLINE OF BELOW GRADE STRUCTURE

15 PRE-FINISHED METAL SOFFIT

16 36" X 30" SINGLE LEAF GALVANIZED ROOF HATCH WITH UPRIGHT SAFETY BAR

17 BUILT-UP ROOF SYSTEM WITH MINERAL SURFACE CAP SHEET ON 2" OF RIGID INSULATION

18 24" WIDE ROOF ACCESS LADDER ATTACHED TO CMU WALL

19 REMOVABLE STEEL ROOF RAILING 24" HIGH

20 AREA DEDICATED FOR ROCK CLIMBING WALL

21 REINFORCED SLAB ON GRADE

SYM	DESCRIPTION	DATE	APPR
1	X	00/00/00	X

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DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL SPECIAL WAREFARE COMMAND
CORONADO, CA
NAVAL AMPHIBIOUS BASE
SPECIAL WARFARE AREA TRAINING 4 & 5
NILAND, CA

TRAINING RANGE PROJECT
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE

SNIPER TOWER FLOOR PLANS, ELEVATIONS & SECTION

SCALE: AS NOTED

EPROJECT NO.: X

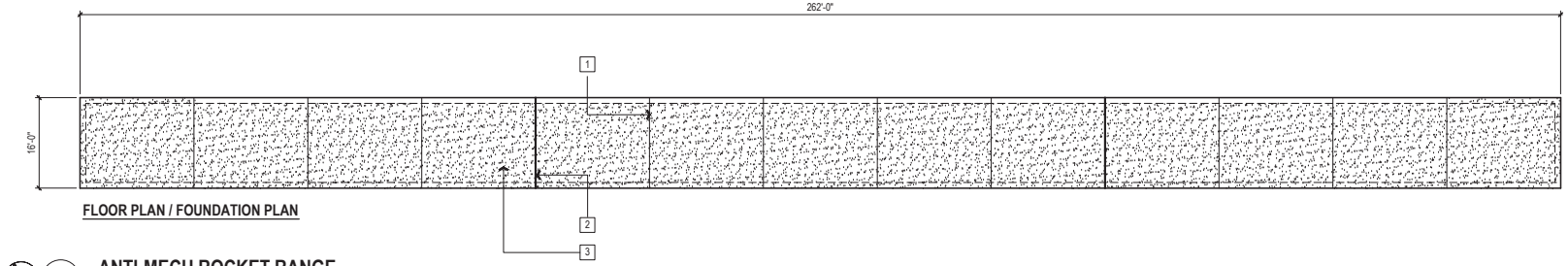
CONSTR. CONTR. NO. X

NAVFAC DRAWING NO.

SHEET X OF X

A-101

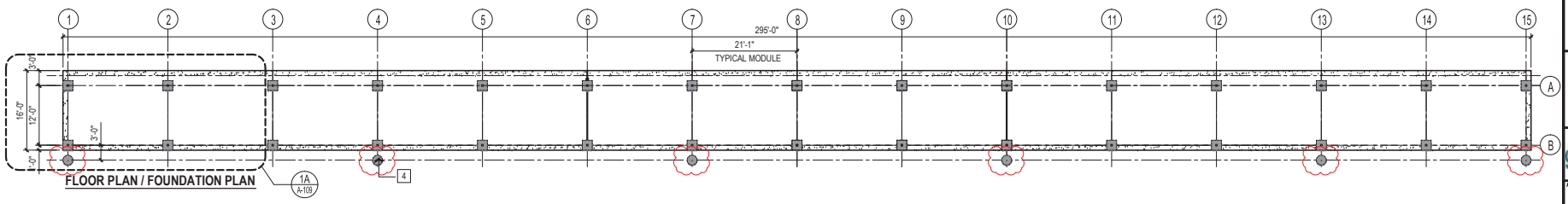
GMHA, 201309



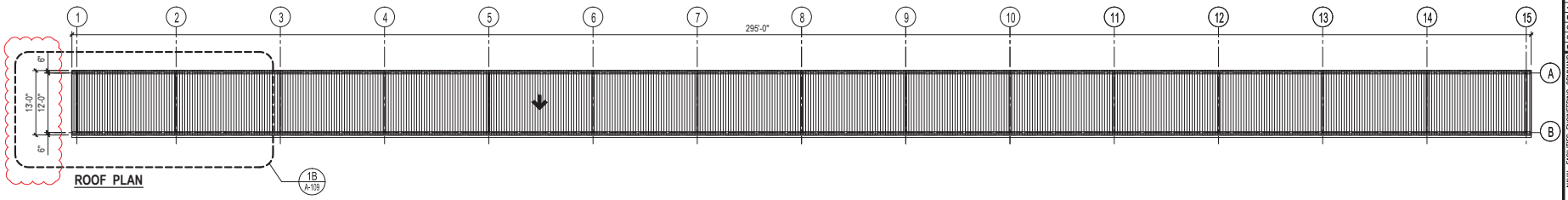
FLOOR PLAN / FOUNDATION PLAN

1 ANTI-MECH ROCKET RANGE

3/32 "=1'-0" 0 4' 8' 12'



FLOOR PLAN / FOUNDATION PLAN



ROOF PLAN

2 ANTI-MECH GRENADE / UNKNOWN DISTANCE SNIPER RANGE

3/32 "=1'-0" 0 4' 8' 12'

KEYNOTES X

KEYNOTES ARE CONSIDERED "TYPICAL" UON AND IS TO BE APPLIED TO EVERY SIMILAR CONDITION WHETHER OR NOT THE REFERENCE KEYNOTE IS REPEATED

1 CONCRETE SLAB CONTRACTION JOINT, 1" DEEP

2 CONCRETE SLAB CONSTRUCTION JOINT

3 REINFORCED CONCRETE SLAB WITH PERIMETER WIDENED FOOTING

4 PROTECTION POST (BOLLARD) IN FRONT OF CANOPY SUPPORT POST

SYM	DESCRIPTION	DATE	APPR
1	X	00/00/00	X

APPROVED

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SATISFACTORY TO DATE DD/MM/YY

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BRANCH MANAGER XX

CHIEF ENG/ARCH XX

GOV FPE XX

REVIEWER XX

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL SPECIAL WAREFARE COMMAND
NAVAL AMPHIBIOUS BASE CORONADO, CA
SPECIAL WARFARE AREA TRAINING 4 & 5 NILAND, CA

TRAINING RANGE PROJECT
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE
ANTI-MECH ROCKET AND ANTI-MECH GRENADE / UNKNOWN DISTANCE SNIPER RANGE

SCALE: AS NOTED

EPROJECT NO.: X

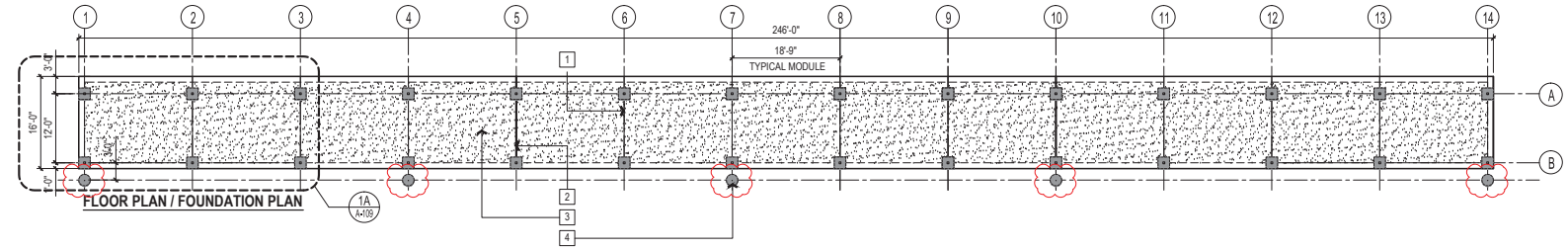
CONSTR. CONTR. NO. X

NAVFAC DRAWING NO.

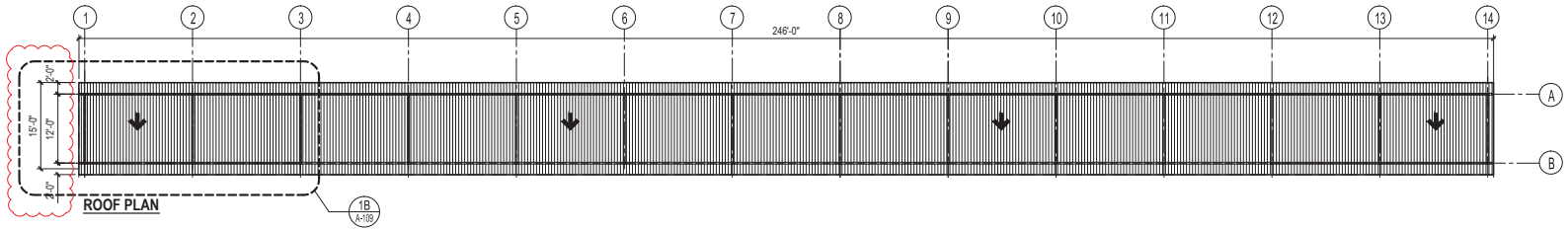
SHEET X OF X

A-102

GMHA, 201309



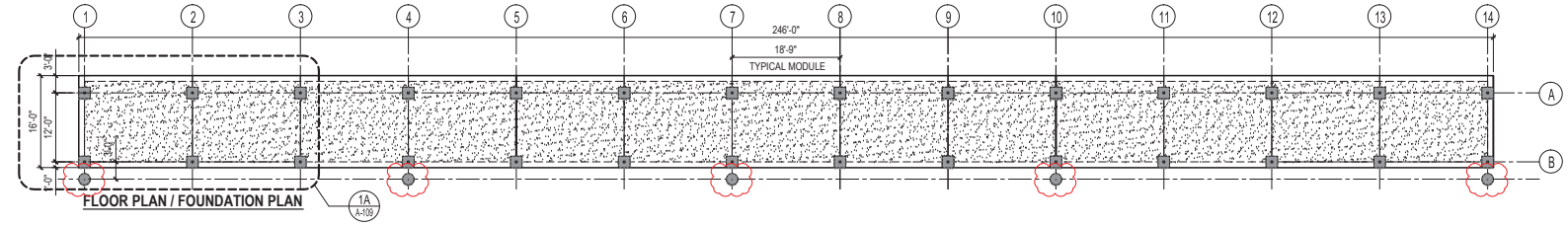
FLOOR PLAN / FOUNDATION PLAN



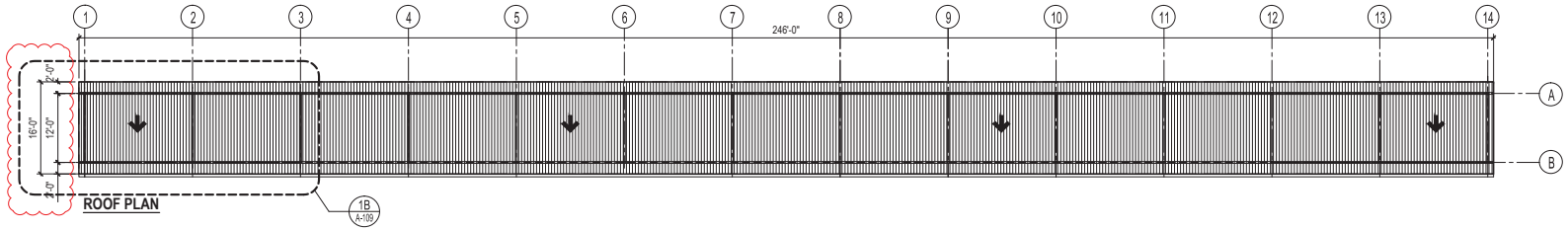
ROOF PLAN

1 600M KNOWN DISTANCE RANGE

3/32 "=1'-0" 0 4' 8' 12'



FLOOR PLAN / FOUNDATION PLAN



ROOF PLAN

2 600M UNKNOWN DISTANCE RANGE

3/32 "=1'-0" 0 4' 8' 12'

KEYNOTES X

KEYNOTES ARE CONSIDERED "TYPICAL" UON AND IS TO BE APPLIED TO EVERY SIMILAR CONDITION WHETHER OR NOT THE REFERENCE KEYNOTE IS REPEATED

1 CONCRETE SLAB CONTRACTION JOINT, 1" DEEP

2 CONCRETE SLAB CONSTRUCTION JOINT

3 REINFORCED CONCRETE SLAB WITH PERIMETER WIDENED FOOTING

4 PROTECTION POST (BOLLARD) IN FRONT OF CANOPY SUPPORT POST

SYM	DESCRIPTION	DATE	APPR
X	X	00/00/00	X

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SATISFACTORY TO DATE DD/MM/YY

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CHIEF ENG/ARCH XX

GOV PPE XX

REVIEWER XX

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NAVAL FACILITIES ENGINEERING COMMAND
CORONADO, CA
NAVAL AMPHIBIOUS BASE
NILAND, CA
SPECIAL WARFARE AREA TRAINING 4 & 5
TRAINING RANGE PROJECT
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE
600M KNOWN AND UNKNOWN DISTANCE RANGES

SCALE: AS NOTED

EPROJECT NO.: X

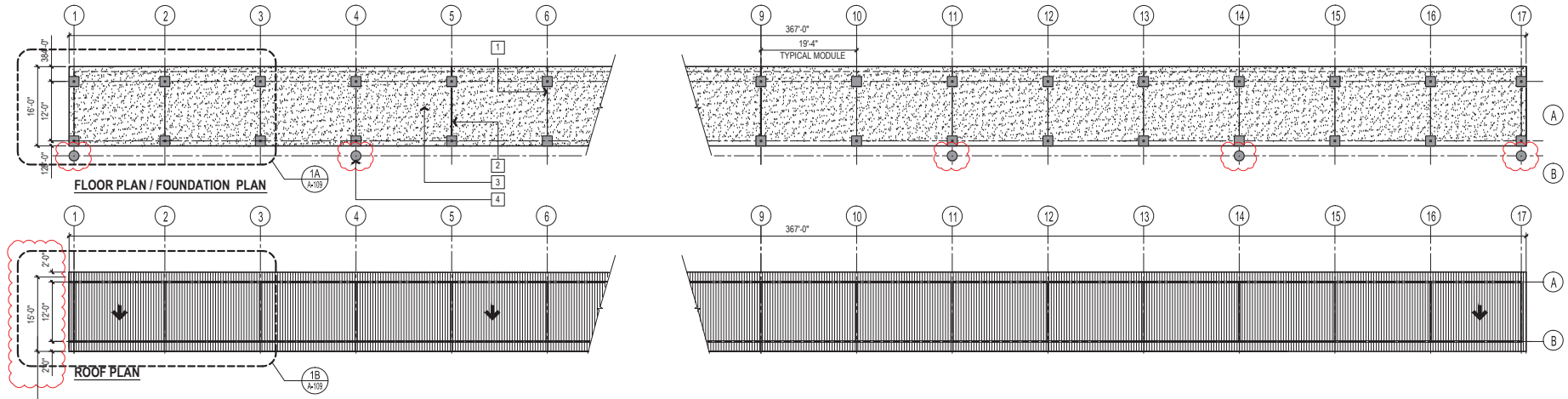
CONSTR. CONTR. NO. X

NAVFAC DRAWING NO.

SHEET X OF X

A-103

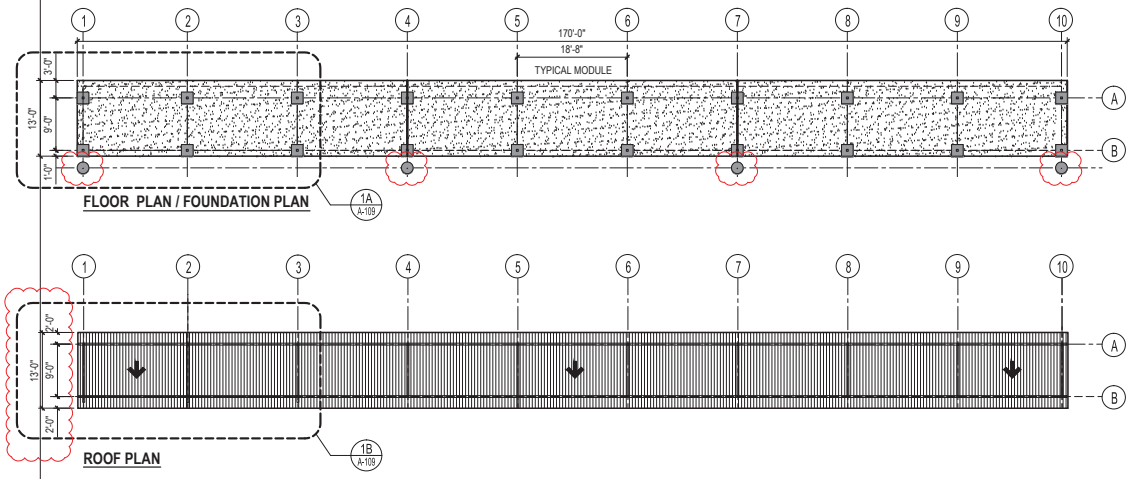
GMHA, 201309



1 MULTI-PURPOSE MACHINE GUN RANGE

3/32"=1'-0" 0 4' 8' 12'

NOTE:
RANGE SLAB AND CANOPY TO BE CONSTRUCTED TO FOLLOW SITE PAD RADIUS CONFIGURATION



2 50M SAR # 1 & 2 RANGES

3/32"=1'-0" 0 4' 8' 12'

KEYNOTES X

KEYNOTES ARE CONSIDERED "TYPICAL" UON AND IS TO BE APPLIED TO EVERY SIMILAR CONDITION WHETHER OR NOT THE REFERENCE KEYNOTE IS REPEATED

1 CONCRETE SLAB CONTRACTION JOINT, 1" DEEP

2 CONCRETE SLAB CONSTRUCTION JOINT

3 REINFORCED CONCRETE SLAB WITH PERIMETER WIDENED FOOTING

4 PROTECTION POST (BOLLARD) IN FRONT OF CANOPY SUPPORT POST

SYM	DESCRIPTION	DATE	APPR
X		00/00/00	X

APPROVED

FOR COMMANDER NAVFAC

ACTIVITY

SATISFACTORY TO DATE DD/MM/YY

DES XX DRW XX CHK XXX

<<PM/DM>> XX

BRANCH MANAGER XX

CHIEF ENG/ARCH XX

GOV FPE XX

REVIEWER XX

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
CORONADO, CA
NAVAL SPECIAL WAREFARE COMMAND
NAVAL AMPHIBIOUS BASE
SPECIAL WARFARE AREA TRAINING 4 & 5
NILAND, CA
TRAINING RANGE PROJECT
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE
MULTI-PURPOSE MACHINE GUN, 50M SAR #1 & #2 RANGES

SCALE: AS NOTED

EPROJECT NO.: X

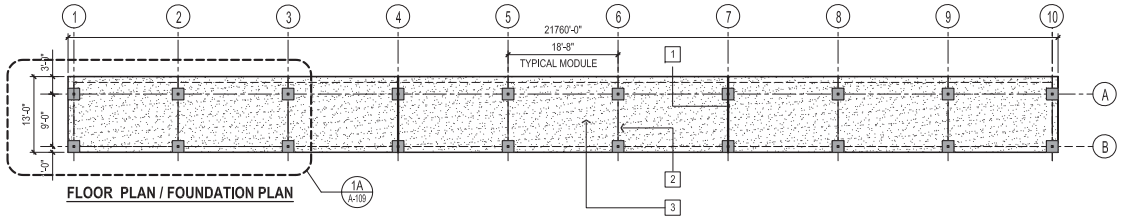
CONSTR. CONTR. NO. X

NAVFAC DRAWING NO.

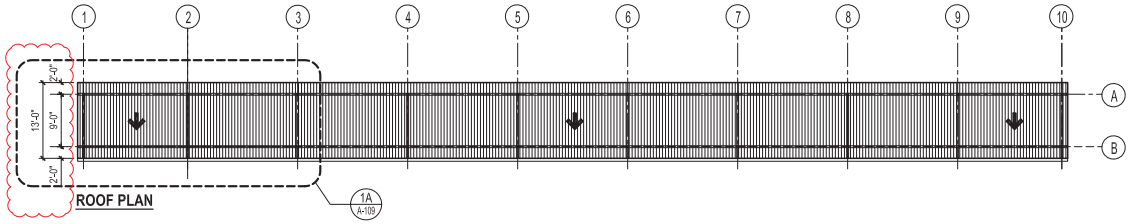
SHEET X OF X

A-104

GMHA, 201309



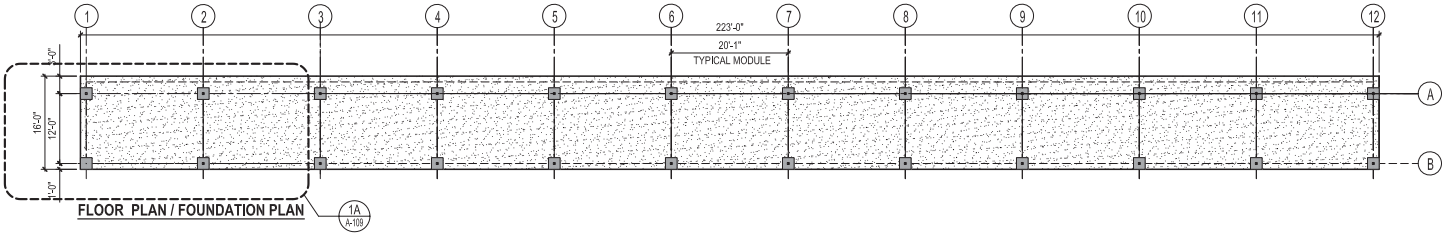
FLOOR PLAN / FOUNDATION PLAN



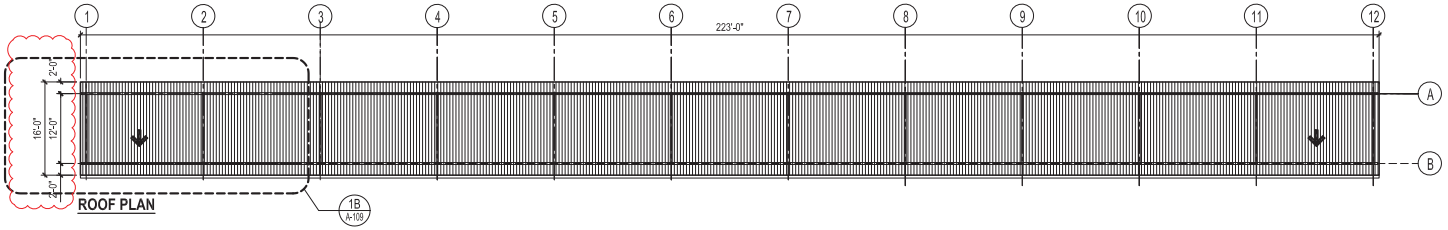
ROOF PLAN

1 100M SAR # 1 & 2 RANGE

3/32 "=1'-0" 0 4' 8' 12'



FLOOR PLAN / FOUNDATION PLAN



ROOF PLAN

2 2000 KNOWN DISTANCE SNIPER RANGE

3/32 "=1'-0" 0 4' 8' 12'

KEYNOTES X

KEYNOTES ARE CONSIDERED "TYPICAL" UON AND IS TO BE APPLIED TO EVERY SIMILAR CONDITION WHETHER OR NOT THE REFERENCE KEYNOTE IS REPEATED

1 CONCRETE SLAB CONTRACTION JOINT, 1" DEEP

2 CONCRETE SLAB CONSTRUCTION JOINT

3 REINFORCED CONCRETE SLAB WITH PERIMETER WIDENED FOOTING

SYM	DESCRIPTION	DATE	APPR
X	X	00/00/00	X

APPROVED

FOR COMMANDER NAVFAC

ACTIVITY —

SATISFACTORY TO DATE DD/MM/YY

DES XX DFW XX CHK XXX

<<PM/DM>> XX

BRANCH MANAGER XX

CHIEF ENG/ARCH XX

GOV FPE XX

REVIEWER XX

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL SPECIAL WAREFARE COMMAND
NAVAL AMPHIBIOUS BASE CORONADO, CA
SPECIAL WARFARE AREA TRAINING 4 & 5 NILAND, CA
TRAINING RANGE PROJECT
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE
100M SAR #1 & #2, 2000M KNOWN DISTANCE SNIPER RANGE

SCALE: AS NOTED

EPROJECT NO.: X

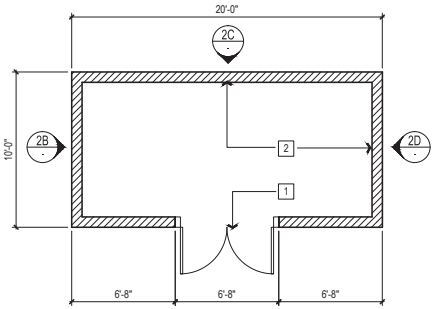
CONSTR. CONTR. NO. X

NAVFAC DRAWING NO.

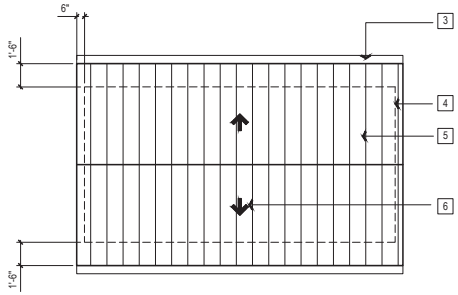
SHEET X OF X

A-105

GMHA, 201309



PLAN

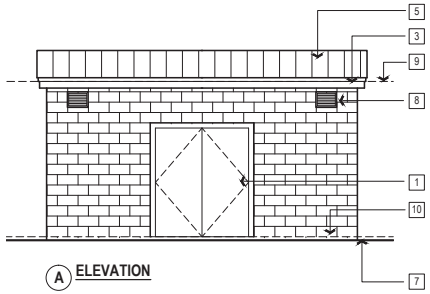


ROOF PLAN

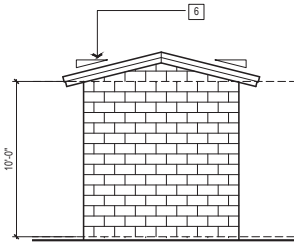
KEYNOTES X

KEYNOTES ARE CONSIDERED "TYPICAL" UON AND IS TO BE APPLIED TO EVERY SIMILAR CONDITION WHETHER OR NOT THE REFERENCE KEYNOTE IS REPEATED

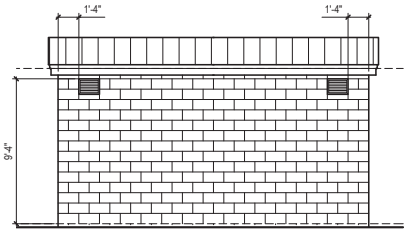
1. PAIR OF 3'-0"x7'-0" FLUSH HOLLOW EXTRA HEAVY DUTY METAL DOOR AND FRAME
2. REINFORCED GROUTED CONCRETE MASONRY WALL
3. EAVE GUTTER
4. PERIMETER CONCRETE WALL BELOW
5. PRE-FINISHED 2" INSULATED METAL ROOF PANELS
6. ROOF SLOPE 3":12"
7. SITE GRADE
8. VENTILATION LOUVERS WITH INSECT SCREEN
9. INDICATES TOP OF CONCRETE MASONRY WALL
10. INDICATES FINISH FLOOR LINE
11. 8" SLAB ON GRADE REINFORCED WITH #5 REBAR @ 16" O.C. EACH WAY
12. 12"x12" WIDEN FOOTING AT PERIMETER OF SLAB
13. STEEL WALL SUPPORT
14. STEEL SUPPORT FOOTING
15. WALL FOOTING
16. INDICATES WALL CONSTRUCTION (MASONRY OF CONCRETE BLOCK)
17. WALL BREACHING FRAME AND PANEL, SEE 3A
18. DOOR BREACHING FRAME, SEE 3C 3D 3E 3F 3G
19. REINFORCED FOUNDATION SYSTEM
20. STEEL PLATE
21. BOLT HOLE
22. 8"x 8" WIDE FLANGE COLUMN WELDED TO STEEL PLATE
23. EMBEDDED STEEL PLATE WITH 12" LONG ANCHOR BOLTS WELDED TO PLATE
24. THREADED BOLT HOLD
25. COLUMN AND PLATE (SEE DETAIL 3C) PLACED ON EMBEDDED PLATE WITH BOLT HOLES ALIGNED. ADJUST AS REQUIRED TO ACCOMMODATE DOOR FRAME SIZE
26. 2x WOOD FRAMING SHIMS BOLTED TO COLUMN
27. 3/4 " GAP BETWEEN CONCRETE AND PLATE
28. STEEL CHANNEL CONNECTING FRAME
29. 8"x 8" WIDE FLANGE COLUMN EMBEDDED IN CONCRETE
30. 8" OR 12" STEEL CHANNEL FRAME
31. 1/2 "x 3" THRU SLOT
32. PANEL FRAME, SEE 3B
33. PLATE STEEL GUSSET
34. 3/16 " x 2"x 2" TUBE STEEL
35. PROPOSED CONCRETE BLOCK WALL



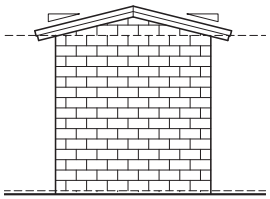
A ELEVATION



B ELEVATION



C ELEVATION

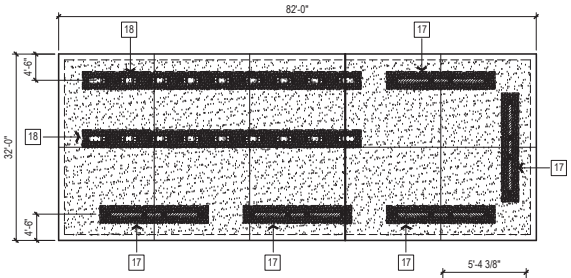


D ELEVATION

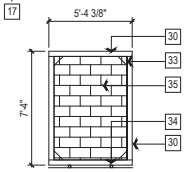
2 TARGET / STORAGE SHED

200 SQUARE FEET LOCATED IN RANGES

1/4 "=1'-0"



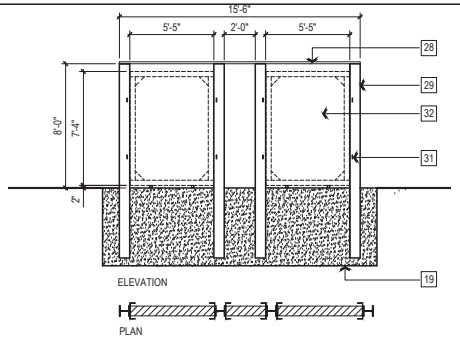
FLOOR PLAN / FOUNDATION PLAN



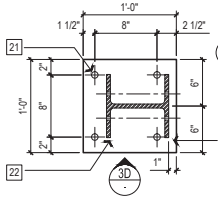
B WALL PANEL FRAME
1/4 "=1'-0"

3 EXPLOSIVES RANGE

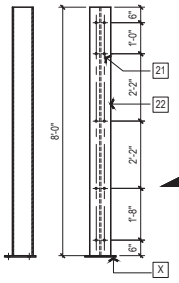
3/32 "=1'-0"



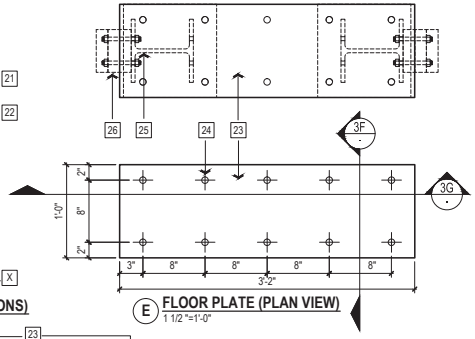
A TWO BAY WALL BREACH FRAME
1/4 "=1'-0"



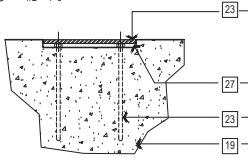
C SUPPORT BEAM (PLAN VIEW)
1 1/2 "=1'-0"



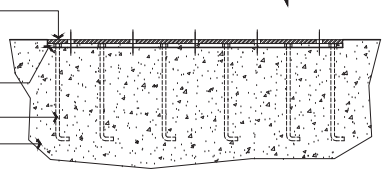
D SUPPORT BEAM, (ELEVATIONS)
1/2 "=1'-0"



E FLOOR PLATE (PLAN VIEW)
1 1/2 "=1'-0"



F FLOOR PLATE (SECTION)
1 1/2 "=1'-0"



G FLOOR PLATE (SECTION
1 1/2 "=1'-0"

SYM	DESCRIPTION	DATE	APPR
I	X	X	00/00/00	X

APPROVED

FOR COMMANDER NAVFAC

ACTIVITY

SATISFACTORY TO DATE DD/MM/YY

DES XX DRW XX CHK XXX

<<PM/IND>> XX

BRANCH MANAGER XX

CHIEF ENG/ARCH XX

GOV FPE XX

REVIEWER XX

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
CORONADO, CA
NAVAL AMPHIBIOUS BASE
SPECIAL WARFARE AREA TRAINING 4 & 5
NILAND, CA

NAVAL SPECIAL WAREFARE COMMAND

TRAINING RANGE PROJECT
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE

TARGET / STORAGE SHED AND EXPLOSIVE RANGE

SCALE: AS NOTED

EPROJECT NO.: X

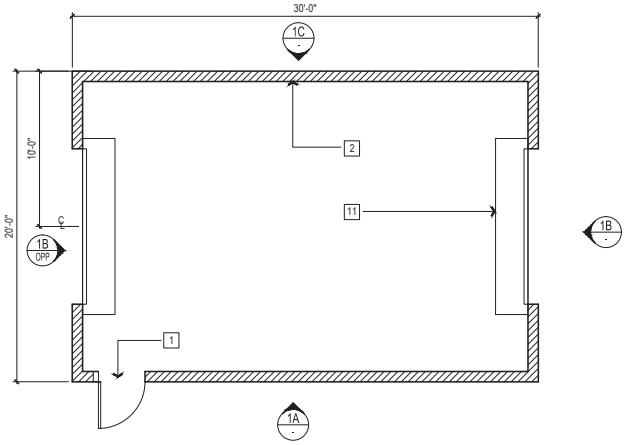
CONSTR. CONTR. NO. X

NAVFAC DRAWING NO.

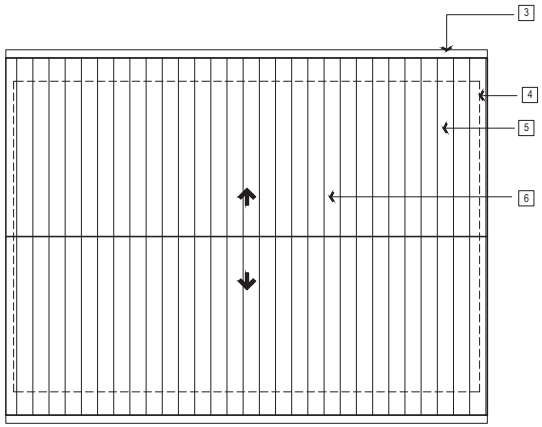
SHEET X OF X

A-106

GMHA, 201309



PLAN



ROOF PLAN

KEYNOTES X

KEYNOTES ARE CONSIDERED "TYPICAL" UON AND IS TO BE APPLIED TO EVERY SIMILAR CONDITION WHETHER OR NOT THE REFERENCE KEYNOTE IS REPEATED

1 DOOR 3'-0"x7'-0" FLUSH HOLLOW EXTRA HEAVY DUTY METAL DOOR AND FRAME

2 REINFORCED GROUTED CONCRETE MASONRY WALL

3 EAVE GUTTER

4 PERIMETER CONCRETE WALL BELOW

5 PRE-FINISHED 2" INSULATED METAL ROOF PANELS

6 ROOF SLOPE 3":12"

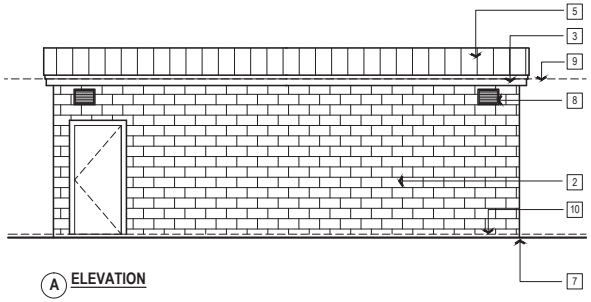
7 SITE GRADE

8 VENTILATION LOUVERS WITH INSECT SCREEN

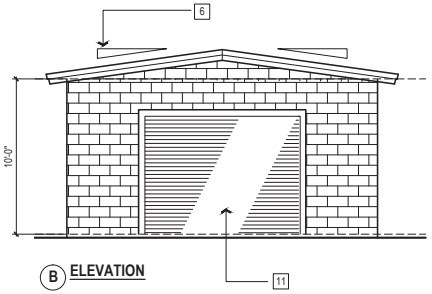
9 INDICATES TOP OF CONCRETE MASONRY WALL

10 INDICATES FINISH FLOOR LINE

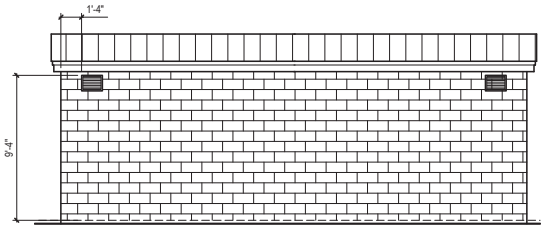
11 10'-0" X 8'-0" SERVICE DOOR



A ELEVATION



B ELEVATION



C ELEVATION

1 TARGET / STORAGE SHED

600 SQUARE FEET

1/4 "=1'-0" 0 2' 4' 6'

SYM	DESCRIPTION	DATE	APPR
I	X	00/00/00	X

APPROVED

FOR COMMANDER NAVFAC

ACTIVITY

SATISFACTORY TO DATE DD/MM/YY

DES XX DRW XX CHK XXX

<<PM/TM/>> XX

BRANCH MANAGER XX

CHIEF ENG/ARCH XX

GOV FPE XX

REVIEWER XX

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL SPECIAL WAREFARE COMMAND
CORONADO, CA
NAVAL AMPHIBIOUS BASE
SPECIAL WARFARE AREA TRAINING 4 & 5
NILAND, CA

TRAINING RANGE PROJECT
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE

TARGET / STORAGE SHED

SCALE: AS NOTED

EPROJECT NO.: X

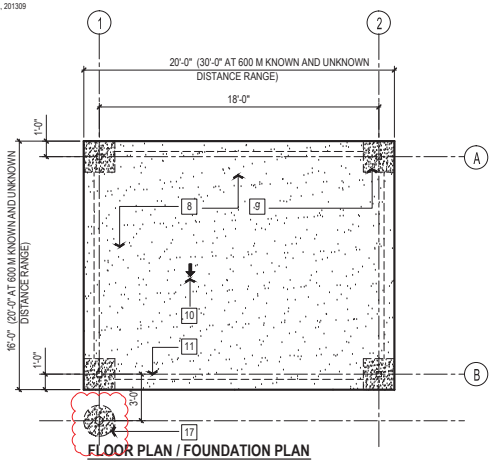
CONSTR. CONTR. NO. X

NAVFAC DRAWING NO.

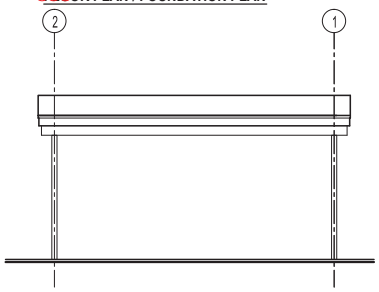
SHEET X OF X

A-107

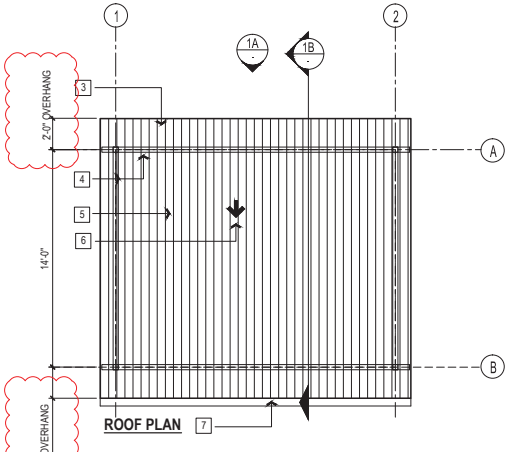
GMHA, 201309



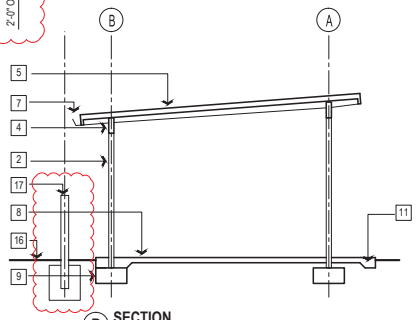
FLOOR PLAN / FOUNDATION PLAN



A ELEVATION



ROOF PLAN



B SECTION

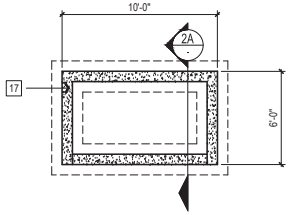
1 AMMO HANDLING AREA

0 2' 4' 6'
SCALE 1/4"=1'-0"

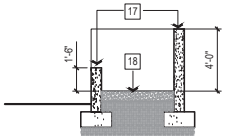
KEYNOTES X

KEYNOTES ARE CONSIDERED "TYPICAL" UON AND IS TO BE APPLIED TO EVERY SIMILAR CONDITION WHETHER OR NOT THE REFERENCE KEYNOTE IS REPEATED

1 INDICATES OUTLINE OF ROOF EDGE ABOVE
2 METAL CANOPY SUPPORT COLUMN
3 RAKE ROOF LINE
4 METAL SUPPORT BEAMS
5 PREFINISHED 2" INSULATED METAL ROOF PANELS
6 ROOF PITCH 1":12"
7 ROOF EAVE LINE WITH GUTTER
8 4" CONCRETE SLAB ON GRADE REINFORCED WITH #4 REBAR @ 24" O.C. EACH WAY
9 METAL COLUMN SUPPORT ISOLATED FOOTING
10 SLOPE SLAB 1/4":12"
11 8" x8" WIDEN FOOTING AT PERIMETER OF SLAB
12 2" x4" CEDAR DECKING
13 METAL WORKBENCH SUPPORT POST
14 WORKBENCH SUPPORT POST FOOTING
15 METAL WORKBENCH BEAM SUPPORT SYSTEM
16 GRADE
17 PROTECTION POST (BOLLARD) IN FRONT OF CANOPY SUPPORT POST WHERE APPLICABLE
17 REINFORCE CONCRETE WALL AND FOUNDATION SYSTEM
18 SAND FILLED PIT



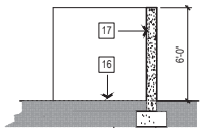
FLOOR PLAN / FOUNDATION PLAN



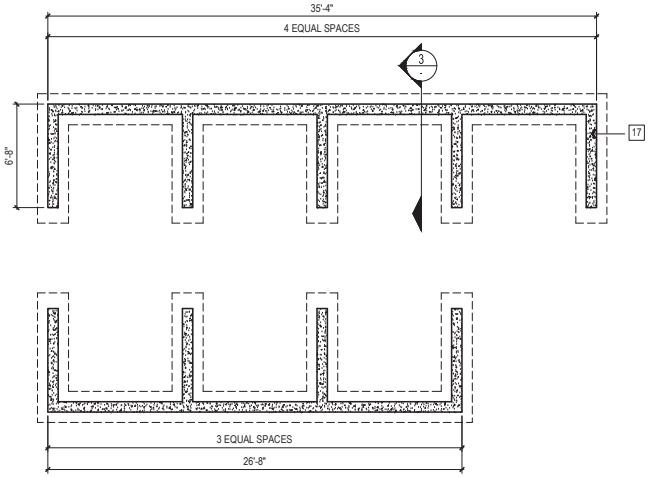
A SECTION

2 HAND GRANADE PIT

0 2' 4' 6'
SCALE 1/4"=1'-0"



A SECTION



FLOOR PLAN / FOUNDATION PLAN

3 RECYCLING BINS

0 2' 4' 6'
SCALE 1/4"=1'-0"

SYM	DESCRIPTION	DATE	APPR
I	X	00/00/00	X

APPROVED

FOR COMMANDER NAVFAC

ACTIVITY —

SATISFACTORY TO DATE DD/MM/YY

DES XX DRW XX CHK XXX

<<PM/ENG>> XX

BRANCH MANAGER XX

CHIEF ENG/ARCH XX

GOV FPE XX

REVIEWER XX

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
CORONADO, CA
NAVAL AMPHIBIOUS BASE NILAND, CA
SPECIAL WARFARE AREA TRAINING 4 & 5
TRAINING RANGE PROJECT
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE
AMMO HANDLING AREA, HAND GRENADE PIT AND RECYCLING BINS

SCALE: AS NOTED

EPROJECT NO.: X

CONSTR. CONTR. NO. X

NAVFAC DRAWING NO.

SHEET X OF X

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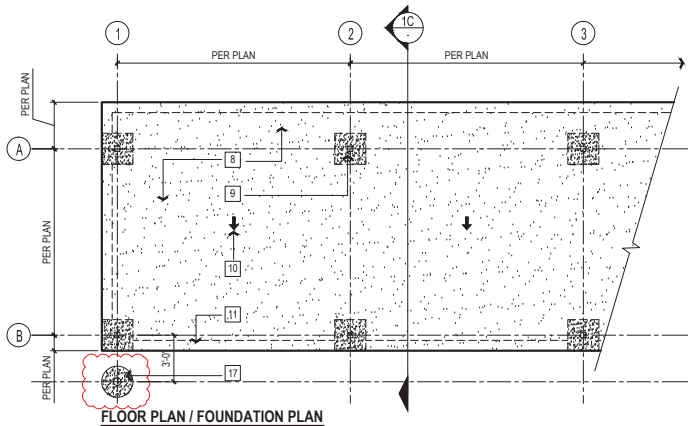
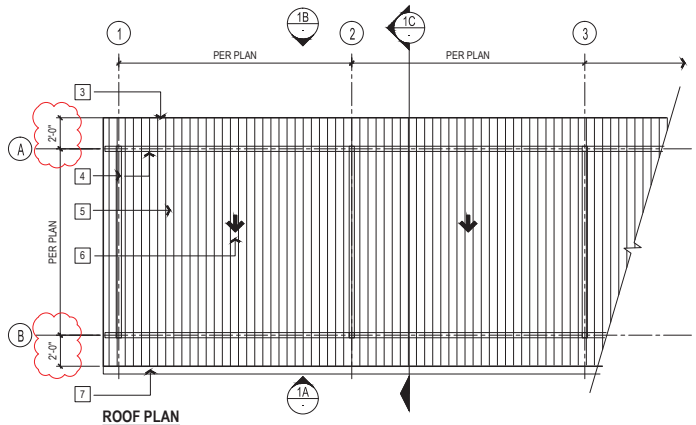
GMHA, 201309



FLOOR PLAN / FOUNDATION PLAN

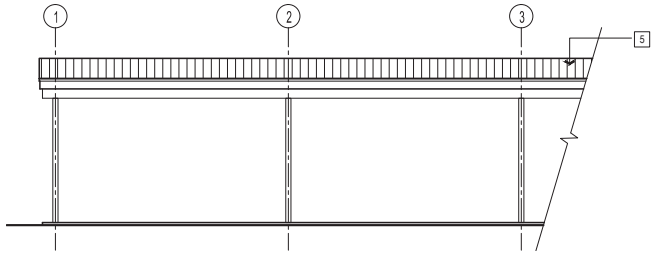


ROOF PLAN

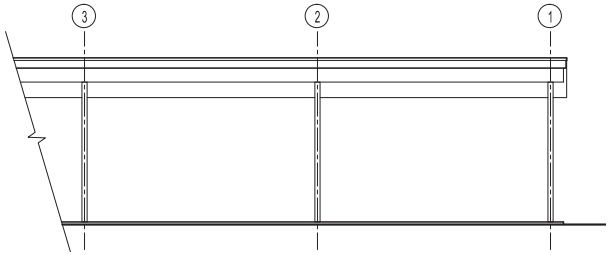
KEYNOTES X

KEYNOTES ARE CONSIDERED "TYPICAL" UON AND IS TO BE APPLIED TO EVERY SIMILAR CONDITION WHETHER OR NOT THE REFERENCE KEYNOTE IS REPEATED

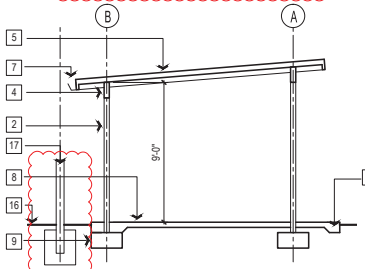
1 INDICATES OUTLINE OF ROOF EDGE ABOVE
2 METAL CANOPY SUPPORT COLUMN
3 RAKE ROOF LINE
4 METAL SUPPORT BEAMS
5 PREFINISHED 2" INSULATED METAL ROOF PANELS
6 ROOF PITCH 1:12"
7 ROOF EAVE LINE WITH GUTTER
8 4" CONCRETE SLAB ON GRADE REINFORCED WITH #4 REBAR @ 24" O.C. EACH WAY
9 METAL COLUMN SUPPORT ISOLATED FOOTING
10 SLOPE SLAB 1/4":12"
11 8" x8" WIDEN FOOTING AT PERIMETER OF SLAB
12 2" x4" CEDAR DECKING
13 METAL WORKBENCH SUPPORT POST
14 WORKBENCH SUPPORT POST FOOTING
15 METAL WORKBENCH BEAM SUPPORT SYSTEM
16 GRADE
17 PROTECTION POST (BOLLARD) IN FRONT OF CANOPY SUPPORT POST WHERE APPLICABLE



A ELEVATION



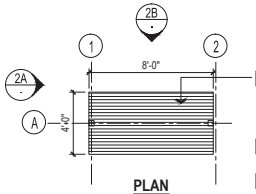
B ELEVATION



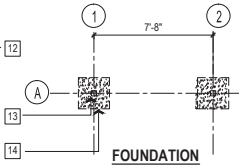
C SECTION

1 CANOPY (SHADE) STRUCTURE MODULE

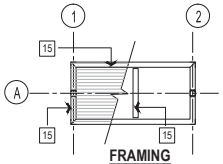
0 2' 4' 6'
SCALE 1/4"=1'-0"



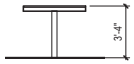
PLAN
32 SQUARE FEET



FOUNDATION



FRAMING



A ELEVATION

B ELEVATION

2 CLEANING TABLE

0 2' 4' 6'
SCALE 1/4"=1'-0"

SYM	DESCRIPTION	DATE	APPR
X		00/00/00	X
X			
I			

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ACTIVITY —

SATISFACTORY TO DATE DD/MM/YY

DES XX DRW XX CHK XXX

<<PM/IND>> XX

BRANCH MANAGER XX

CHIEF ENG/ARCH XX

GOV FPE XX

REVIEWER XX

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
CORONADO, CA
NAVAL SPECIAL WAREFARE COMMAND
NAVAL AMPHIBIOUS BASE
NILAND, CA
SPECIAL WARFARE AREA TRAINING 4 & 5
TRAINING RANGE PROJECT
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE
CANOPY AND CLEANING TABLE PLAN, ELEVATIONS & SECTIONS

SCALE: AS NOTED

EPROJECT NO.: X

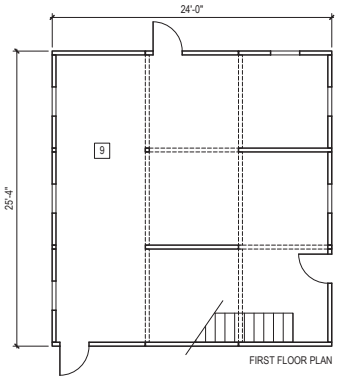
CONSTR. CONTR. NO. X

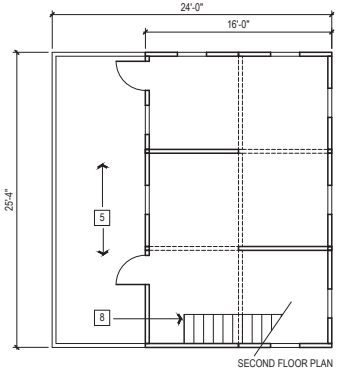
NAVFAC DRAWING NO.

SHEET X OF X

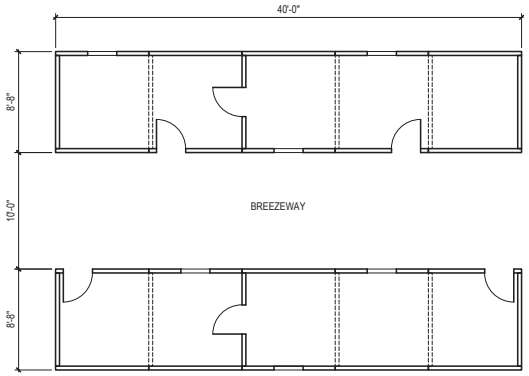
A-109

GMHA, 201309

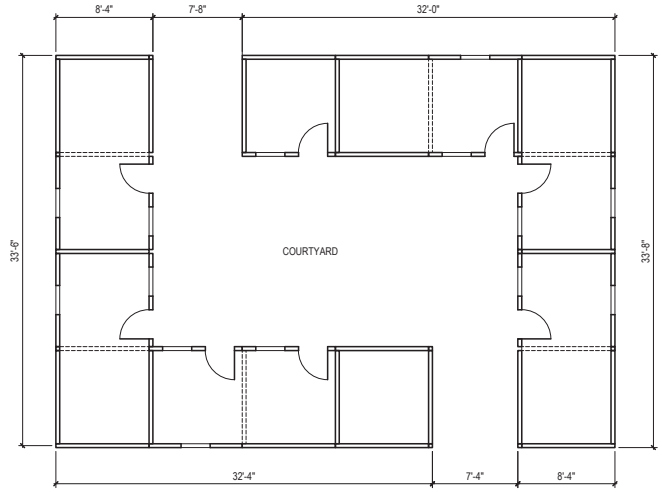




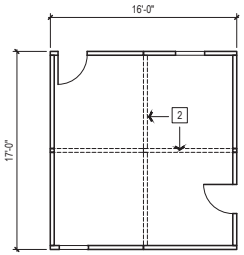
D 2-STORY BUILDING MODULE



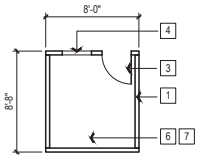
C PARALELL BUILDING MODULE



F COURTYARD BUILDING MODULE



B QUAD MODULE



A SINGLE MODULE

GENERAL NOTES

1 PLACEMENT OF MODULES, QUANTITIES, DOOR AND WINDOW OPENINGS, SINGLE AND MULTI-STORY WILL BE DETERMINE BY THE RANGE MANAGER

2 MODULES ARE DRAWN CONCEPTUALLY FOR REFERENCE ONLY

KEYNOTES X

KEYNOTES ARE CONSIDERED "TYPICAL" UON AND IS TO BE APPLIED TO EVERY SIMILAR CONDITION WHETHER OR NOT THE REFERENCE KEYNOTE IS REPEATED

1 TYPICAL 8'W x 8'H PANELS CONSTRUCTED OF 2-SHEETS OF 4' x 8' OF PLYWOOD, FRAMED WITH 2" x 4" FRAMING

2 INDICATES REMOVABLE OF PANEL TO EXPAND SPACE

3 WOOD COMPOSITE HOLLOW WOOD DOORS WITH HINGES AND LATCHSET

4 WINDOW CUT-OUT (NO WINDOWS TO BE PROVIDED)

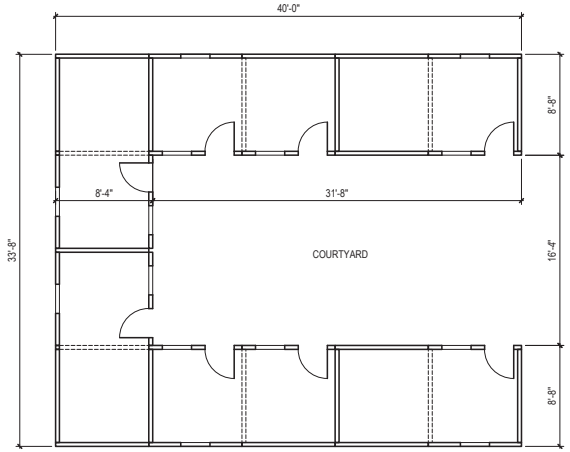
5 WOOD DECK AND RAILING

6 RAISED FLOOR SYSTEM IS FRAMED WITH 2" x 4" JOISTS OR TRUSS JOIST COVERED WITH PLYWOOD

7 CEILING/ROOF SYSTEM IS FRAMED WITH 2" x 4" JOISTS COVERED WITH PLYWOOD

8 WOOD STAIR SYSTEM

9 POST SUPPORT



G U-SHAPE BUILDING MODULE

H PHOTO OF NILAND LFAM BUILDINGS

1 LFAM TEMPORARY BUILDING MODULES

3/16 "=1'-0" 0 2' 4' 8'

I	X	00/00/00	X
SYM	DESCRIPTION	DATE	APPR

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ACTIVITY —

SATISFACTORY TO DATE DD/MM/YY

DES XX DRW XX CHK XXX

<<PM/ENG>> XX

BRANCH MANAGER XX

CHIEF ENG/ARCH XX

GOV FPE XX

REVIEWER XX

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
CORONADO, CA
NAVAL AMPHIBIOUS BASE
SPECIAL WARFARE AREA TRAINING 4 & 5
NILAND, CA
NAVAL SPECIAL WAREFARE COMMAND
TRAINING RANGE PROJECT
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE
LFAM TEMPORARY BUILDING MODULES

SCALE: AS NOTED

EPROJECT NO.: X

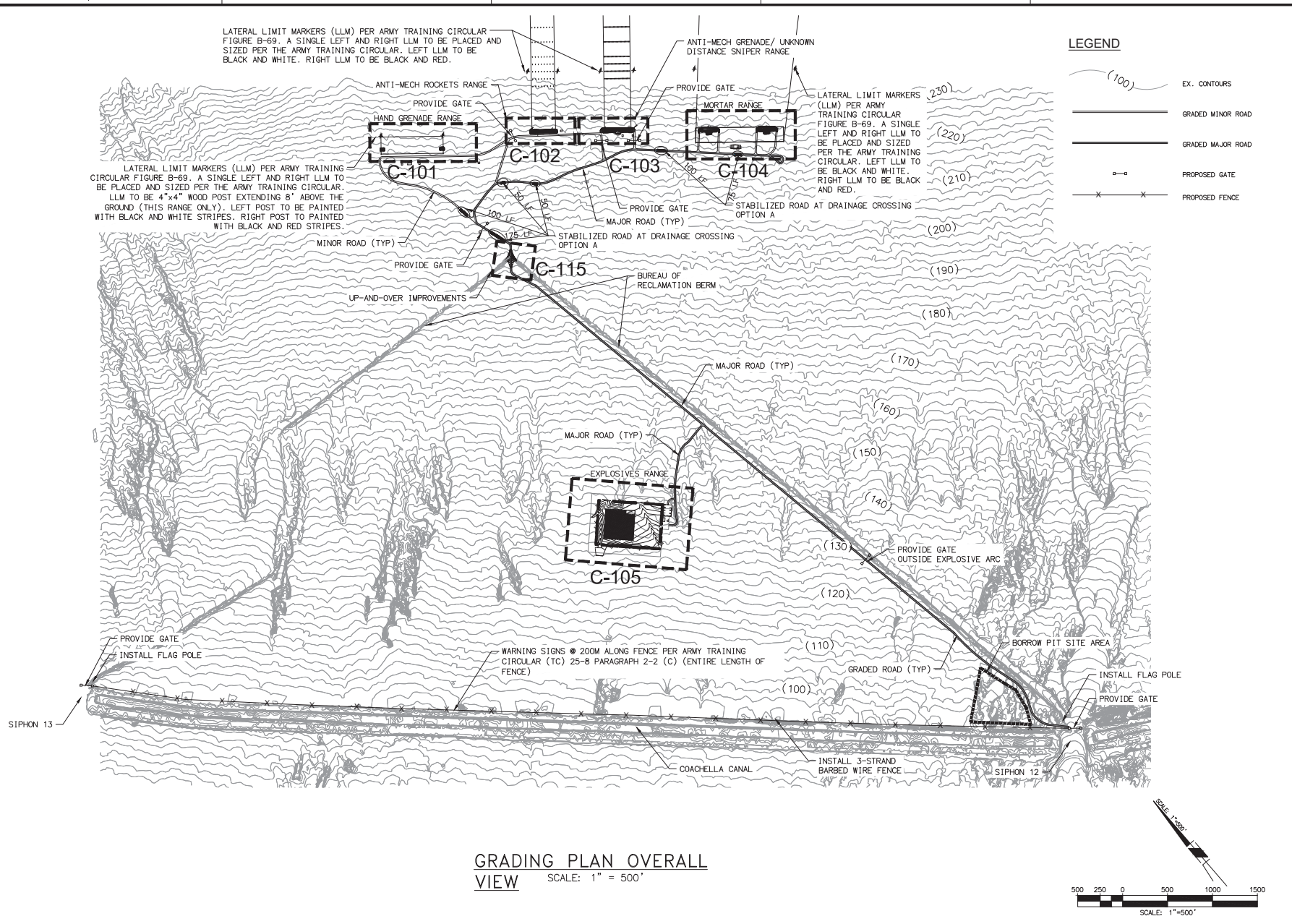
CONSTR. CONTR. NO. X

NAVFAC DRAWING NO.

SHEET X OF X

A-110

GMHA, 201309



GRADING PLAN OVERALL VIEW

SCALE: 1" = 500'

								APP
								DATE
								DESCRIPTION
								DTN
X								
00/00/00								
X								

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FOR COMMANDER NAVFAC

ACTIVITY

SATISFACTORY TO DATE DD/MM/YY

DES XX DRW XX CHK XXX

<<PM/DM>> XX

BRANCH MANAGER XX

CHIEF ENG/ARCH XX

GOV FPE XX

REVIEWER XX

DEPARTMENT OF THE NAVY
NAVAL SPECIAL WARFARE COMMAND
NAVAL AMPHIBIOUS BASE
SPECIAL WARFARE AREA TRAINING 4 & 5
CORONADO, CA
NILAND, CA

TRAINING RANGE PROJECT
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE

GRADING PLAN OVERALL VIEW

SCALE: AS NOTED

EPROJECT NO.: X

CONSTR. CONTR. NO. X

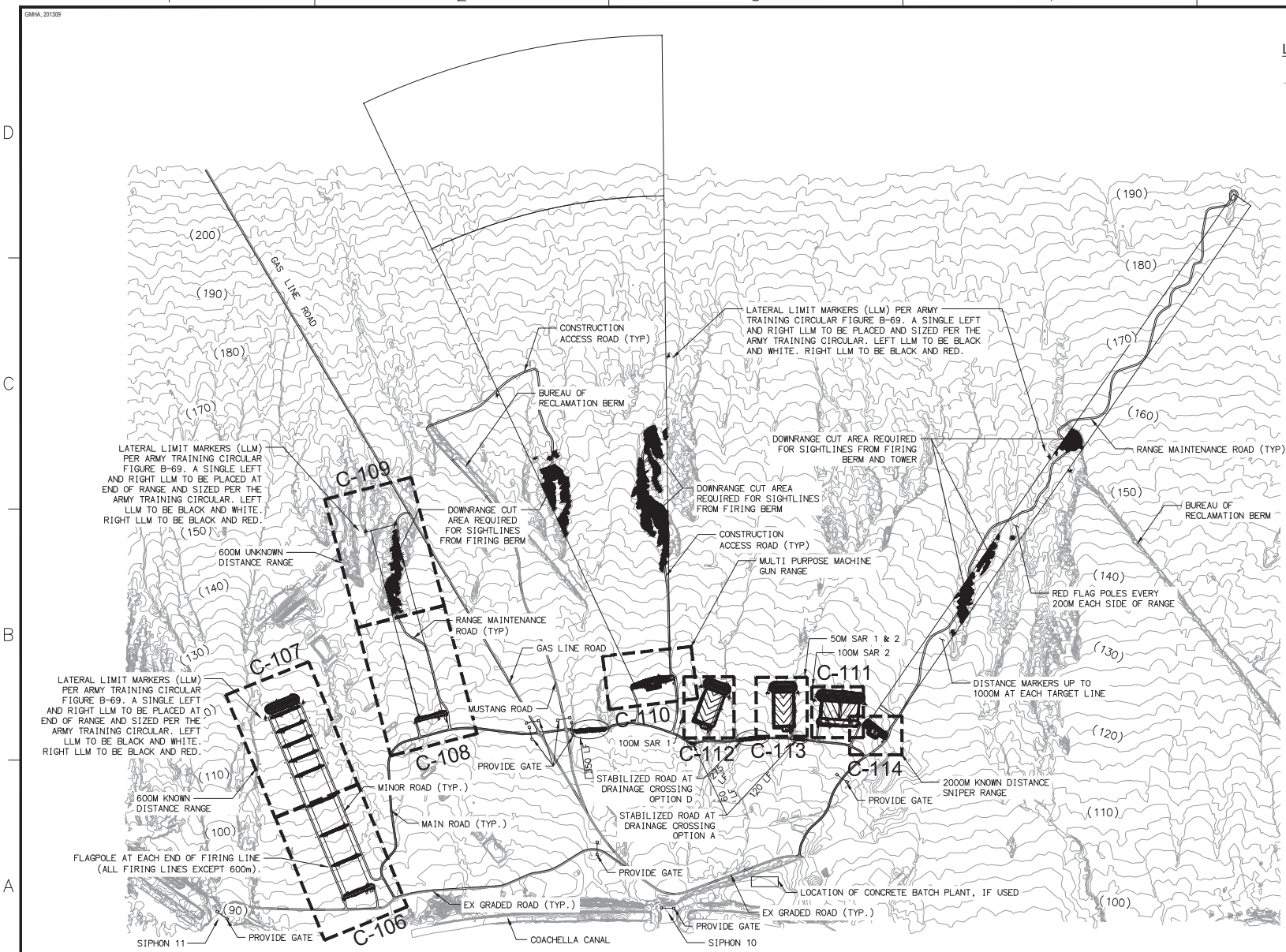
NAVFAC DRAWING NO. — — — —

SHEET 1 OF X

C-100.1

H:\PDATA\136023 SWAT 4 & 5\CADD\LAND\DLV\138 SUBMITTAL\C-100.DWG PICCIRILLO, GARRETT M 12/8/2014 11:57 AM

GMHA, 201309



LEGEND

- (100) EX. CONTOURS
- GRADED MINOR ROAD
- EXISTING ROAD
- GRADED MAJOR ROAD
- PROPOSED GATE
- LATERAL LIMIT MARKERS

NOTES:
1. PROVIDE GATES AT SIPHON 9,10,AND 11

GRADING PLAN OVERALL VIEW

SCALE: 1" = 500'

500 250 0 500 1000 1500
SCALE: 1"=500'

ITM	DESCRIPTION	DATE	APP
1	X	00/00/00	X

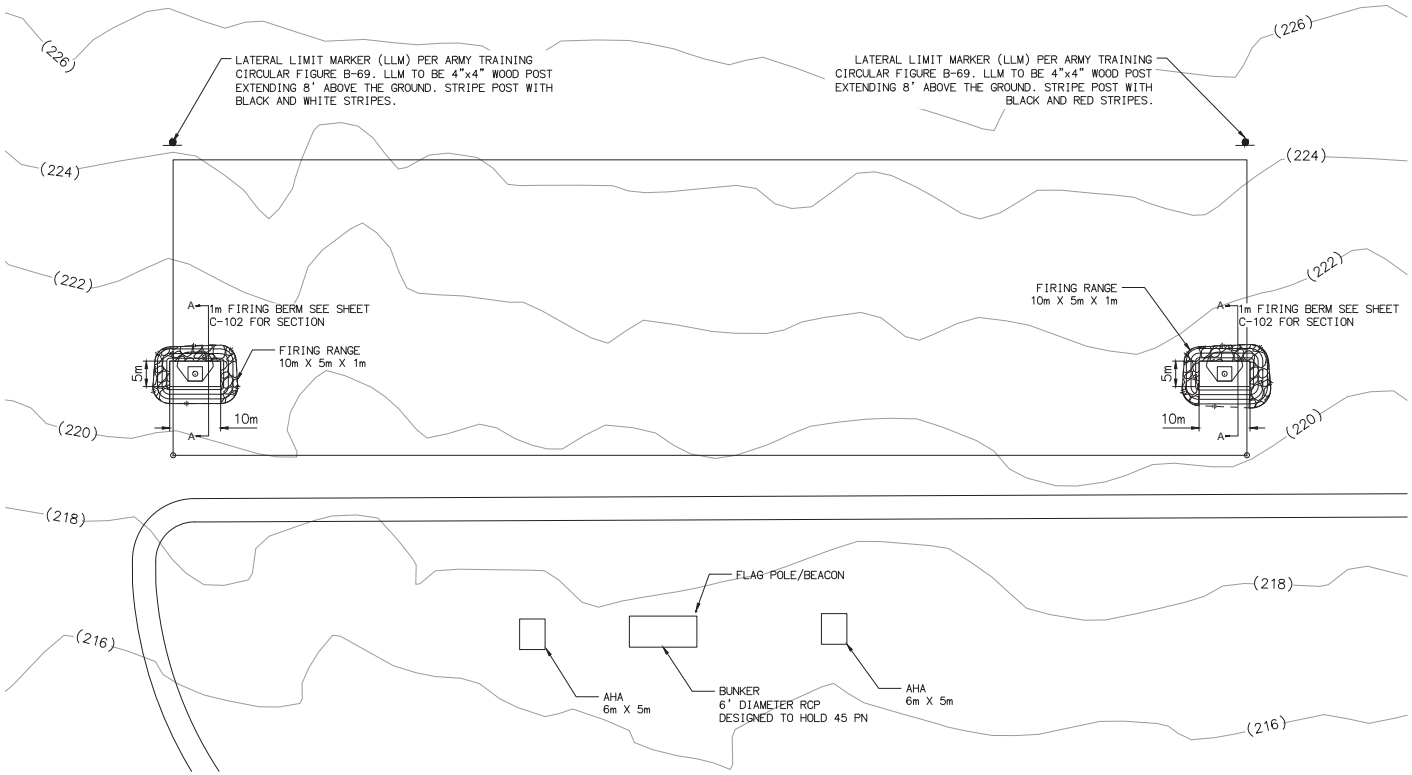
APPROVED
FOR COMMANDER NAVFAC
ACTIVITY
SATISFACTORY TO DATE DD/MM/YY
DES XX DRW XX CHK XXX
<<PM/DM>> XX
BRANCH MANAGER XX
CHIEF ENG/ARCH XX
GOV FPE XX
REVIEWER XX

DEPARTMENT OF THE NAVY
NAVAL SPECIAL WARFARE COMMAND
NAVAL FACILITIES ENGINEERING COMMAND
CORONADO, CA
SPECIAL WARFARE AREA TRAINING 4 & 5
NAVAL AMPHIBIOUS BASE
NILAND, CA
TRAINING RANGE PROJECT
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE
GRADING PLAN OVERALL VIEW

SCALE: AS NOTED
EPROJECT NO.: X
CONSTR. CONTR. NO. X
NAVFAC DRAWING NO. — — — —
SHEET 2 OF X
C-100.2

H:\PDATA\136023 SWAT 4 & 5\CADD\LAND\DLV\138 SUBMITTAL\C-200.DWG PICCIRILLO, GARRETT M 12/8/2014 11:58 AM

GMHA, 201309



LEGEND

- (100) EX. CONTOURS
- 100 PROP. CONTOURS
- LIMIT OF GRADING
- GRADED MINOR ROAD
- SLOPE ARMOR PROTECTION

HAND GRENADE RANGE GRADING PLAN

SCALE: 1" = 40'

SCALE: 1"=40'

40 20 0 40 80 120

ITM	DESCRIPTION	DATE	APP
1	X	00/00/00	X

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
CORONADO, CA
NAVAL AMPHIBIOUS BASE
SPECIAL WARFARE AREA TRAINING 4 & 5
NILAND, CA
TRAINING RANGE PROJECT
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE
HAND GRENADE RANGE GRADING PLAN

RBF CONSULTING

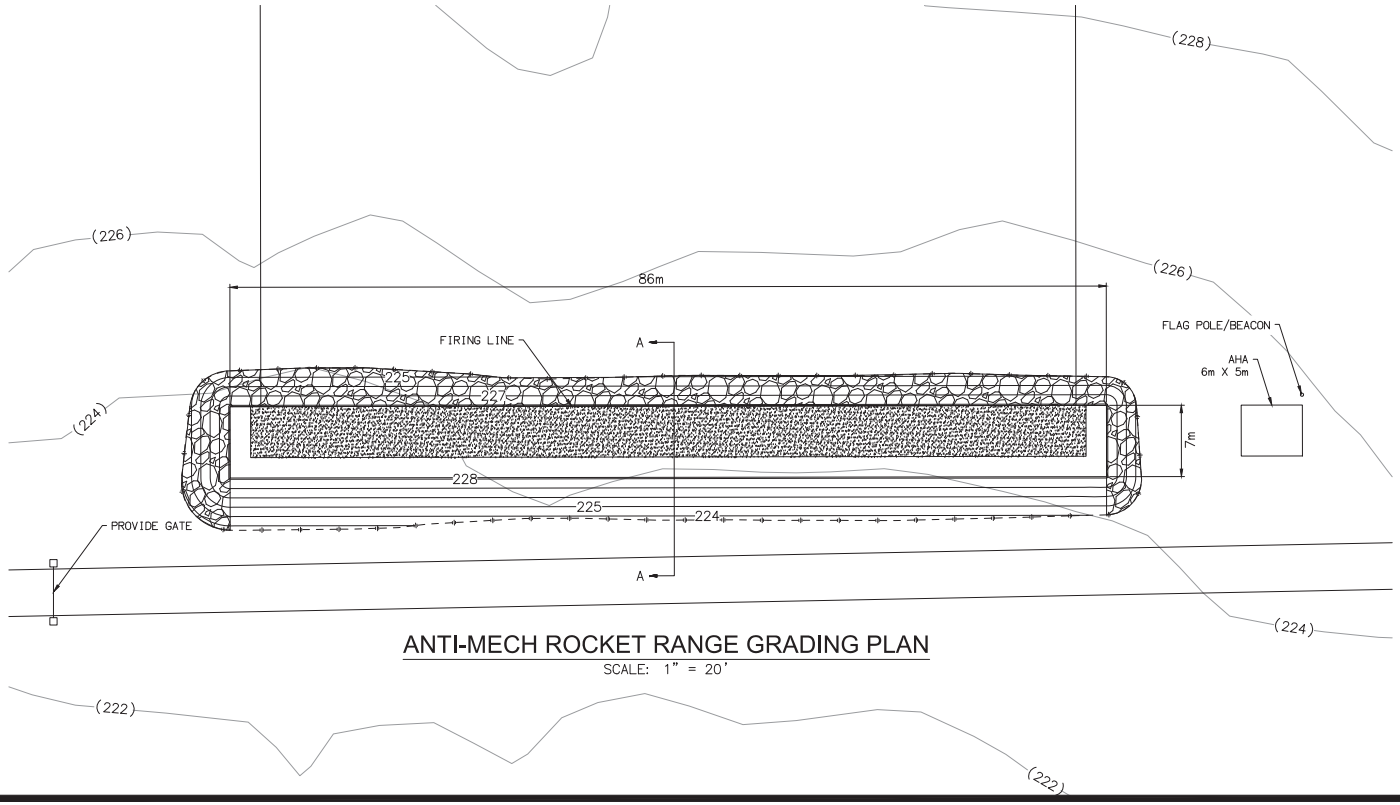
APPROVED
FOR COMMANDER NAVFAC
ACTIVITY
—
SATISFACTORY TO DATE DD/MM/YY
DES XX DRW XX CHK XXX
<<PM/DM>> XX
BRANCH MANAGER XX
CHIEF ENG/ARCH XX
GOV FPE XX
REVIEWER XX

SCALE: AS NOTED
EPROJECT NO.: X
CONSTR. CONTR. NO. X
NAVFAC DRAWING NO. — — — —
SHEET 3 OF X

C-101

ht:\PDATA\136023 SWAT 4 & 5\CADD\LAND\DLV\138 SUBMITTAL\C-101-GP1.DWG P1CCIRILLO, GARRETT M 12/8/2014 11:59 AM

GMHA, 201309

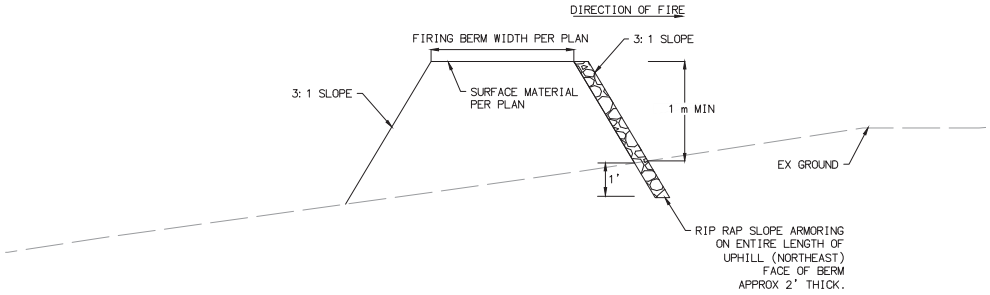


ANTI-MECH ROCKET RANGE GRADING PLAN

SCALE: 1" = 20'

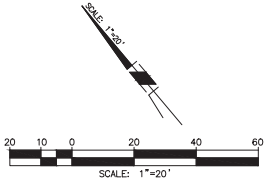
LEGEND

- (100) EX. CONTOURS
- 100 PROP. CONTOURS
- LIMIT OF GRADING
- GRADED MINOR ROAD
- SLOPE ARMOR PROTECTION
- DECOMPOSED GRANITE



SECTION A-A
1 METER FIRING BERM (TYP.)

NOT TO SCALE



I	X	X	00/00/00	X
ITM	DESCRIPTION		DATE	APP

APPROVED

FOR COMMANDER NAVFAC

ACTIVITY

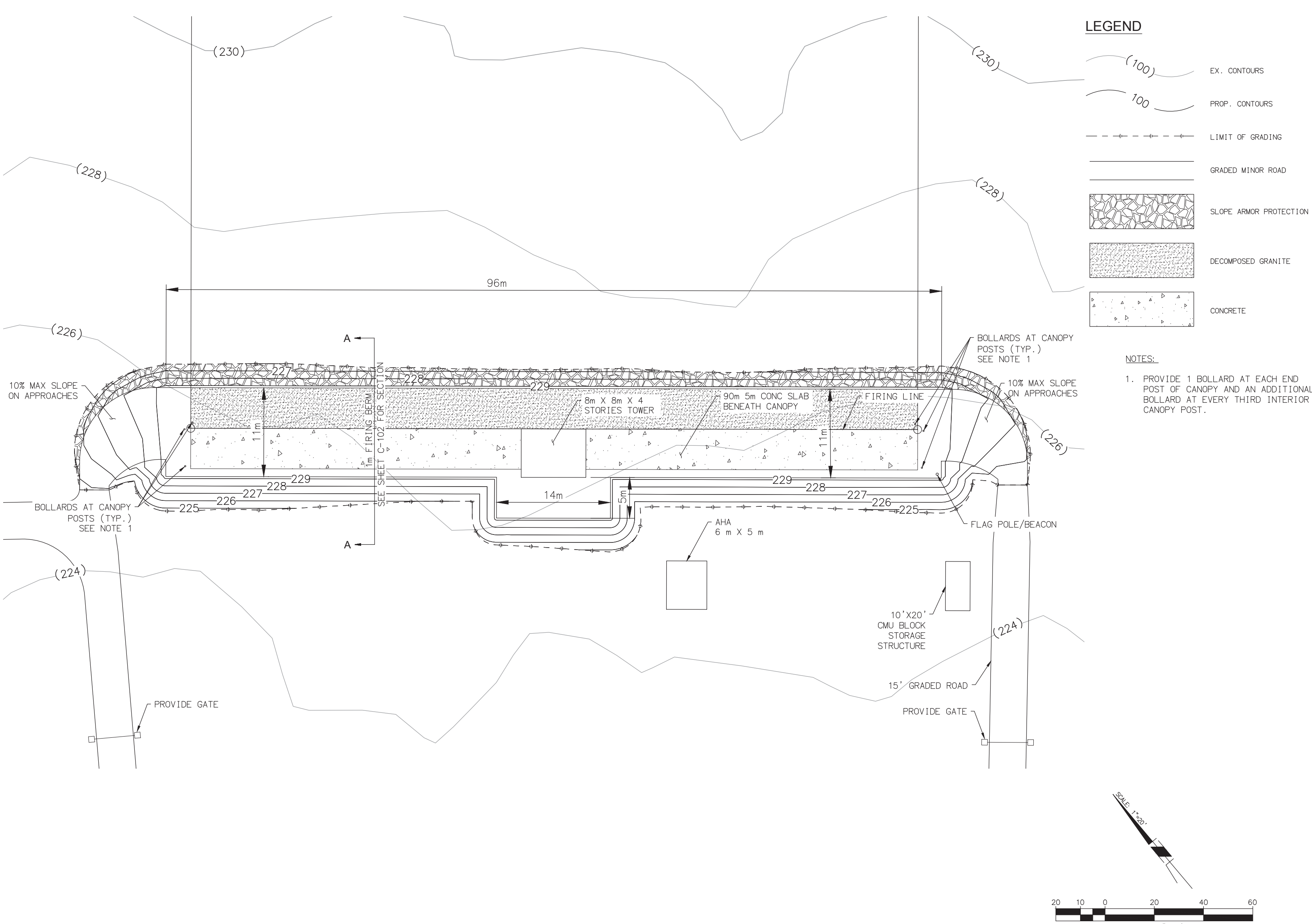
SATISFACTORY TO DATE DD/MM/YY

DES XX	DRW XX	CHK XXX
<<PM/DM>>	XX	
BRANCH MANAGER	XX	
CHIEF ENG/ARCH	XX	
GOV FPE	XX	
REVIEWER	XX	

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL SPECIAL WAREFARE COMMAND
CORONADO, CA
NAVAL AMPHIBIOUS BASE
SPECIAL WARFARE AREA TRAINING 4 & 5
NILAND, CA
TRAINING RANGE PROJECT
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE
ANTI-MECH ROCKET RANGE GRADING PLAN

SCALE: AS NOTED
EPROJECT NO.: X
CONSTR. CONTR. NO. X
NAVFAC DRAWING NO. ----
SHEET 4 OF X
C-102

H:\PDATA\136023 SWAT 4 & 5\CADD\LAND\DLV\15% SUBMITTAL\C-102-GP2.DWG P1OCIRILLO, GARRETT M 12/8/2014 12:01 PM



ANTI-MECH GRENDADE/ UNKNOWN DISTANCE SNIPER RANGE GRADING PLAN

SCALE: 1" = 20'

H:\PDATA\136023 SWAT 4 & 5\CADD\LAND\DLV\15% SUBMITTAL\C-103-GP3.DWG PICCIRILLO, GARRETT M 12/8/2014 12:03 PM

SYM	DESCRIPTION	DATE	APPR
-	X	00/00/00	X

RBF CONSULTING
A [redacted] Company

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ACTIVITY

SATISFACTORY TO DATE DD/MM/YY

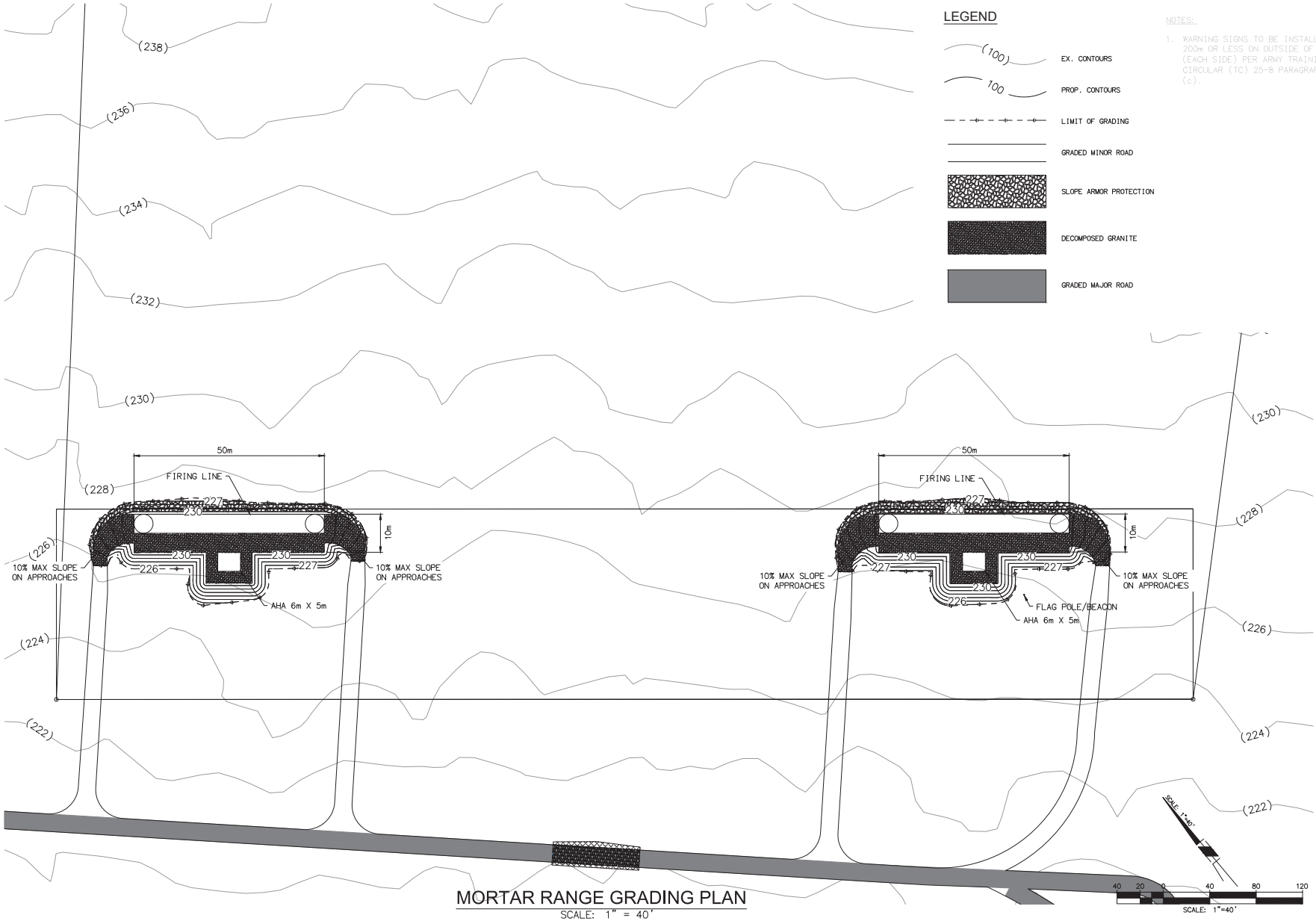
DES XX	DRW XX	CHK XXX
<<PM/DM>>	XX	
BRANCH MANAGER	XX	
CHIEF ENG/ARCH	XX	
GOV FPE	XX	
REVIEWER	XX	

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL SPECIAL WAREFARE COMMAND
NAVAL AMPHIBIOUS BASE CORONADO, CA
SPECIAL WARFARE AREA TRAINING 4 & 5 NILAND, CA
TRAINING RANGE PROJECT
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE
ANTI-MECH GRENDADE/ UNKNOWN DISTANCE SNIPER RANGE GRADING PLAN

SCALE: AS NOTED
EPROJECT NO.: X
CONSTR. CONTR. NO. X
NAVFAC DRAWING NO. ----
SHEET 5 OF X

C-103

GMHA, 201309



MORTAR RANGE GRADING PLAN

SCALE: 1" = 40'

NO.	DESCRIPTION	DATE	APPR
1	X	06/00/00	X

RBF CONSULTING

APPROVED

FOR COMMANDER NAVFAC

ACTIVITY

SATISFACTORY TO DATE DD/MM/YY

DES XX DRW XX CHK XXX

<<PM/DM>> XX

BRANCH MANAGER XX

CHIEF ENG/ARCH XX

GOV. FPE XX

REVIEWER XX

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND

NAVAL AMPHIBIOUS BASE CORONADO, CA

SPECIAL WARFARE AREA TRAINING 4 & 5 NILAND, CA

TRAINING RANGE PROJECT

CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE

MORTAR RANGE GRADING PLAN

SCALE: AS NOTED

EPROJECT NO.: X

CONSTR. CONTR. NO. X

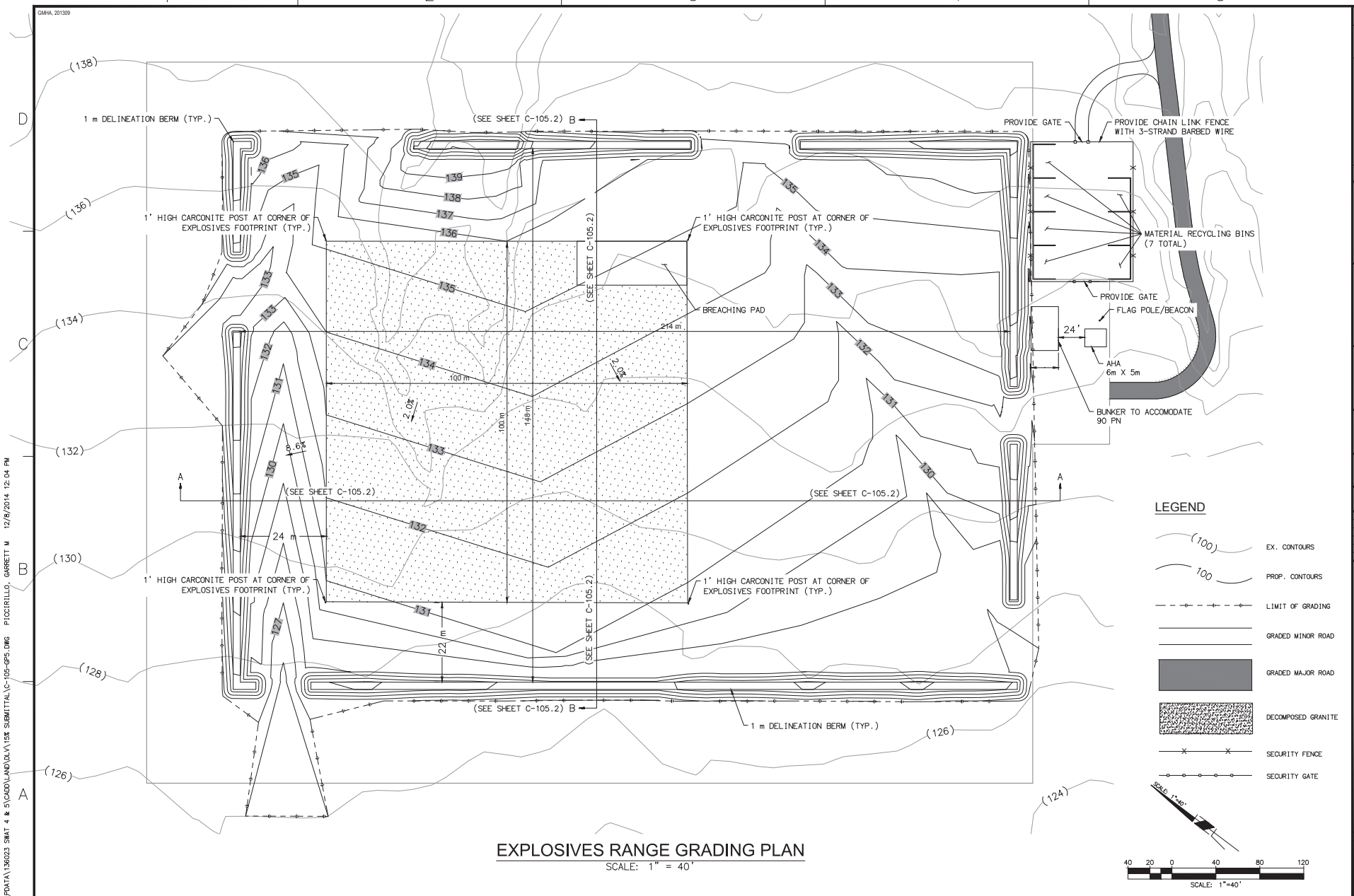
NAVFAC DRAWING NO. -- -- -- --

SHEET 6 OF X

C-104

H:\PDATA\136023 SWAT 4 & 5\CADD\LAND\DLV\15% SUBMITTAL\C-104-GP4.DWG PICCIRILLO, GARRETT M 12/8/2014 1:26 PM

GMHA, 201309



EXPLOSIVES RANGE GRADING PLAN

SCALE: 1" = 40'

1							
X	X	00/00/00	X				
SYM	DESCRIPTION	DATE	APP				

RBF CONSULTING

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ACTIVITY

SATISFACTORY TO DATE DD/MM/YY

DES XX DRW XX CHK XXX

<<PM/DM>> XX

BRANCH MANAGER XX

CHIEF ENG/ARCH XX

GOV FPE XX

REVIEWER XX

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL SPECIAL WAREFARE COMMAND
CORONADO, CA
SPECIAL WARFARE AREA TRAINING 4 & 5
NAVAL AMPHIBIOUS BASE
NILAND, CA
TRAINING RANGE PROJECT
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE
EXPLOSIVES RANGE GRADING PLAN

SCALE: AS NOTED

EPROJECT NO.: X

CONSTR. CONTR. NO. X

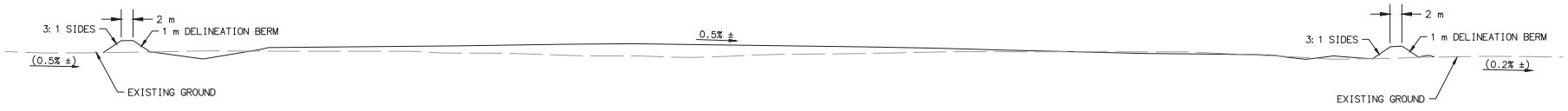
NAVFAC DRAWING NO. – – – –

SHEET 7 OF X

C-105.1

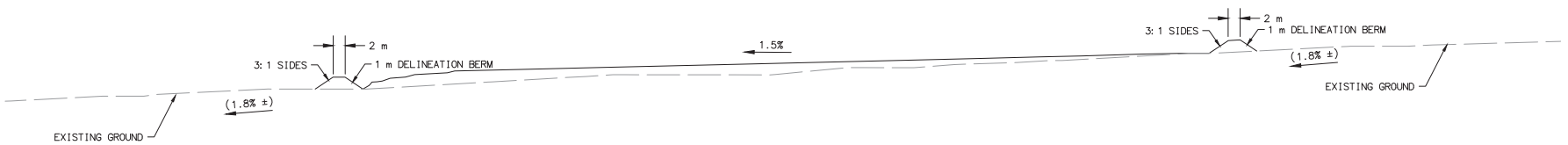
H:\PDATA\136023 SWAT 4 & 5\CADD\LAND\DLV\138 SUBMITTAL\C-105-GP5.DWG P1CCIRILLO, GARRETT M 12/8/2014 12:04 PM

GMHA, 201309



SECTION A-A (SEE SHEET C-105.1)

NOT TO SCALE



SECTION B-B (SEE SHEET C-105.1)

NOT TO SCALE

X							APP
00/00/00							DATE
X							DESCRIPTION
-							SYM

APPROVED

FOR COMMANDER NAVFAC

ACTIVITY

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SATISFACTORY TO DATE DD/MM/YY

DES XX DRW XX CHK XXX

<<PM/DM>> XX

BRANCH MANAGER XX

CHIEF ENG/ARCH XX

GOV FPE XX

REVIEWER XX

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
CORONADO, CA
NAVAL AMPHIBIOUS BASE
SPECIAL WARFARE AREA TRAINING 4 & 5
NILAND, CA

TRAINING RANGE PROJECT
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE

EXPLOSIVES RANGE CROSS SECTIONS

SCALE: AS NOTED

EPROJECT NO.: X

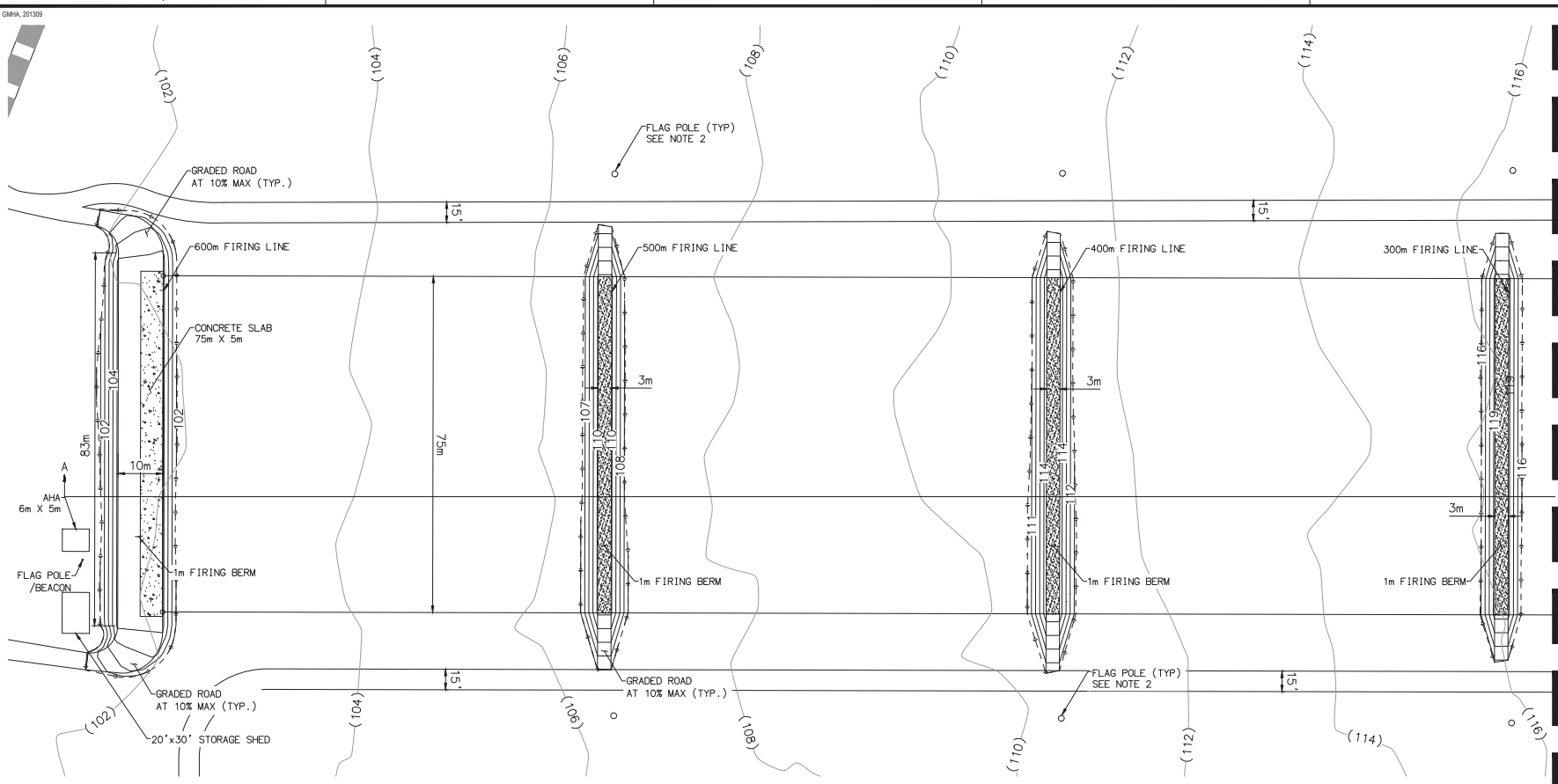
CONSTR. CONTR. NO. X

NAVFAC DRAWING NO. – – – –

SHEET 8 OF X

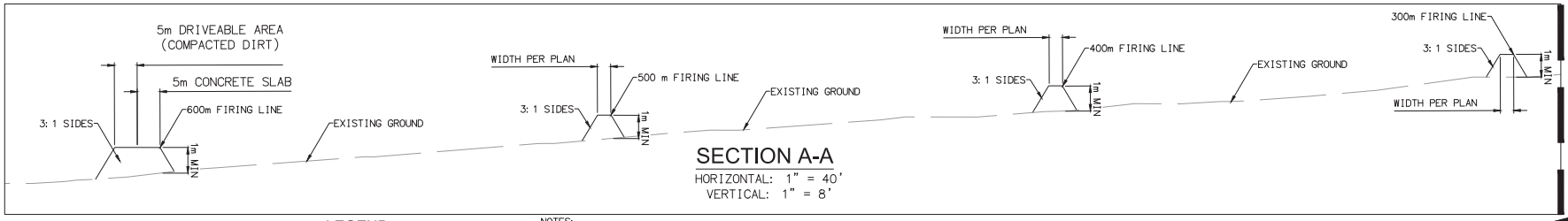
C-105.2

H:\PDATA\136023 SWAT 4 & 5\CADD\LAND\DLV\15% SUBMITTAL\C-105-GP5_1.2.DWG PICCIRILLO, GARRETT M 12/8/2014 12:05 PM



600M KNOWN DISTANCE RANGE GRADING PLAN

SCALE: 1" = 40'



SECTION A-A

HORIZONTAL: 1" = 40'
VERTICAL: 1" = 8'

LEGEND

DECOMPOSED GRANITE

CONCRETE

GRADED MINOR ROAD

NOTES:

1. PROVIDE 1 BOLLARD AT EACH END POST OF CANOPY AND AN ADDITIONAL BOLLARD AT EVERY THIRD INTERIOR CANOPY POST.

2. PROVIDE FLAG POLE AT EACH END OF FIRING LINE (ALL FIRING LINES EXCEPT 600m).

3. LATERAL LIMIT MARKERS (LLM) PER ARMY TRAINING CIRCULAR FIGURE B-69. A SINGLE LEFT AND RIGHT LLM TO BE PLACED AT END OF RANGE AND SIZED PER THE ARMY TRAINING CIRCULAR. LEFT LLM TO BE BLACK AND WHITE. RIGHT LLM TO BE BLACK AND RED. SEE C-107.

SCALE: 1"=40'

1						APP
X						DATE
X						DESCRIPTION
00/00/00						SYM

APPROVED

FOR COMMANDER NAVFAC

ACTIVITY

SATISFACTORY TO DATE DD/MM/YY

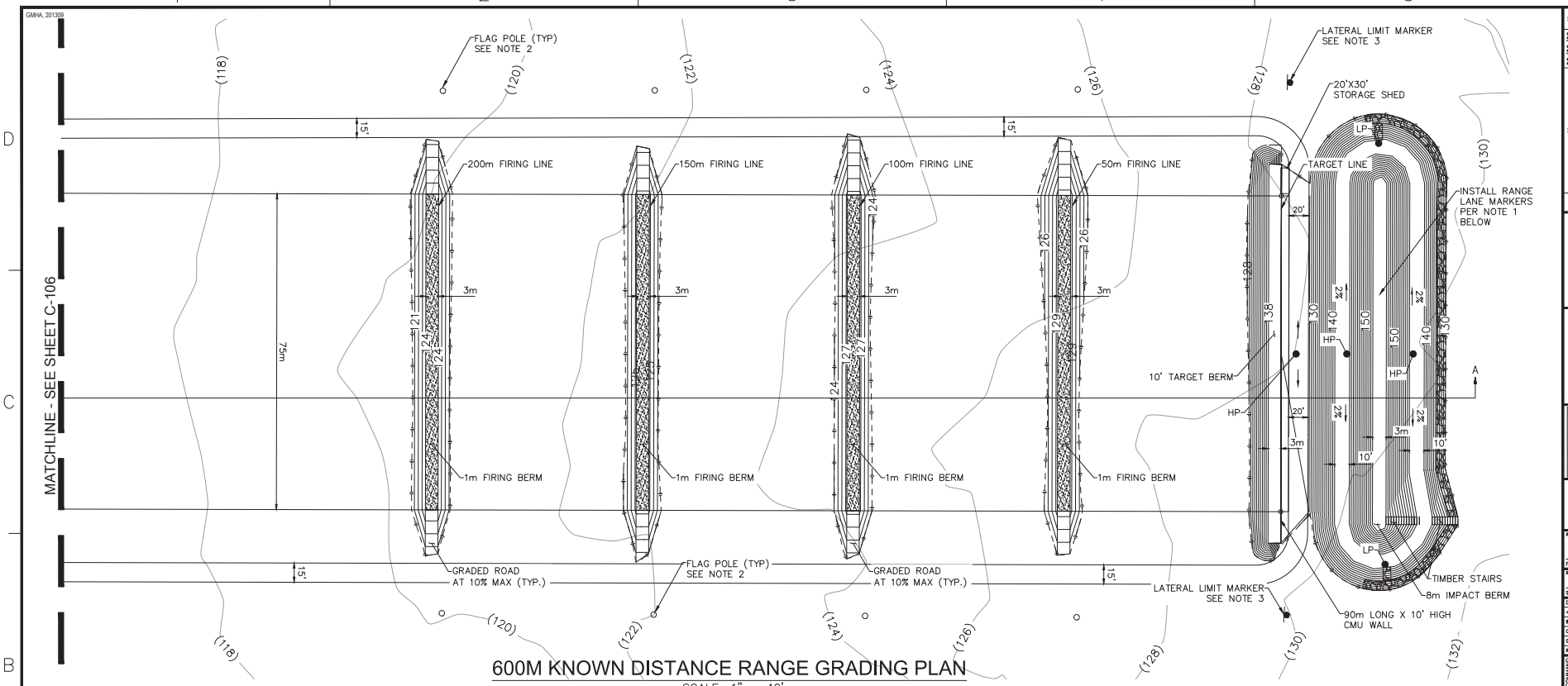
DES XX	DRW XX	CHK XXX	
<<PM/DM>>		XX	
BRANCH MANAGER		XX	
CHIEF ENG/ARCH		XX	
GOV FPE		XX	
REVIEWER		XX	

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL SPECIAL WAREFARE COMMAND
CORONADO, CA
NAVAL AMPHIBIOUS BASE
SPECIAL WARFARE AREA TRAINING 4 & 5
NILAND, CA
TRAINING RANGE PROJECT
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE
600M KNOWN DISTANCE RANGE GRADING PLAN

SCALE: AS NOTED
EPROJECT NO.: X
CONSTR. CONTR. NO. X
NAVFAC DRAWING NO. – – – –
SHEET 9 OF X

C-106

H:\PDATA\136023 SWAT 4 & 5\CADD\LAND\DLV\158 SUBMITTAL\C-201-GP6_1.DWG PICCIRILLO, GARRETT M 12/8/2014 12:07 PM



600M KNOWN DISTANCE RANGE GRADING PLAN

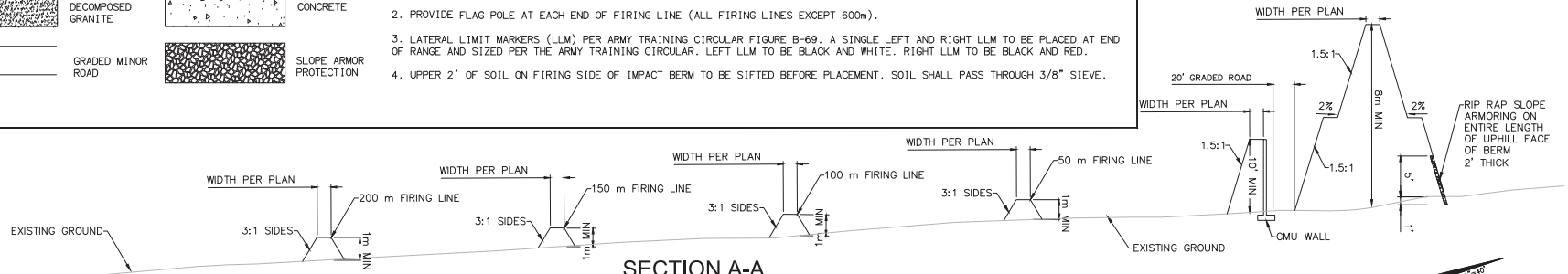
SCALE: 1" = 40'

LEGEND

- DECOMPOSED GRANITE
- CONCRETE
- GRADED MINOR ROAD
- SLOPE ARMOR PROTECTION

NOTES:

1. INSTALL RANGE LANE MARKERS PER ARMY TRAINING CIRCULAR (TC) 25-8 FIGURE B-67.
2. PROVIDE FLAG POLE AT EACH END OF FIRING LINE (ALL FIRING LINES EXCEPT 600m).
3. LATERAL LIMIT MARKERS (LLM) PER ARMY TRAINING CIRCULAR FIGURE B-69. A SINGLE LEFT AND RIGHT LLM TO BE PLACED AT END OF RANGE AND SIZED PER THE ARMY TRAINING CIRCULAR. LEFT LLM TO BE BLACK AND WHITE. RIGHT LLM TO BE BLACK AND RED.
4. UPPER 2' OF SOIL ON FIRING SIDE OF IMPACT BERM TO BE SIFTED BEFORE PLACEMENT. SOIL SHALL PASS THROUGH 3/8" SIEVE.



SECTION A-A

HORIZONTAL: 1" = 40'
VERTICAL: 1" = 8'

SCALE: 1"=40'

DEPARTMENT OF THE NAVY	NAVAL FACILITIES ENGINEERING COMMAND
SPECIAL WARFARE AREA TRAINING 4 & 5	CORONADO, CA
NAVAL AMPHIBIOUS BASE	NILAND, CA

TRAINING RANGE PROJECT
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE
600M KNOWN DISTANCE RANGE GRADING PLAN

SCALE: AS NOTED
EPROJECT NO.: X
CONSTR. CONTR. NO. X
NAVFAC DRAWING NO. ---
SHEET 10 OF X

C-107

I	DESCRIPTION	DATE	APP
X	X	00/00/00	X

APPROVED
FOR COMMANDER NAVFAC
ACTIVITY
SATISFACTORY TO DATE DD/MM/YY
DES XX DRW XX CHK XXX
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BRANCH MANAGER XX
CHIEF ENG/ARCH XX
GOV FPE XX
REVIEWER XX

GMHA, 201309

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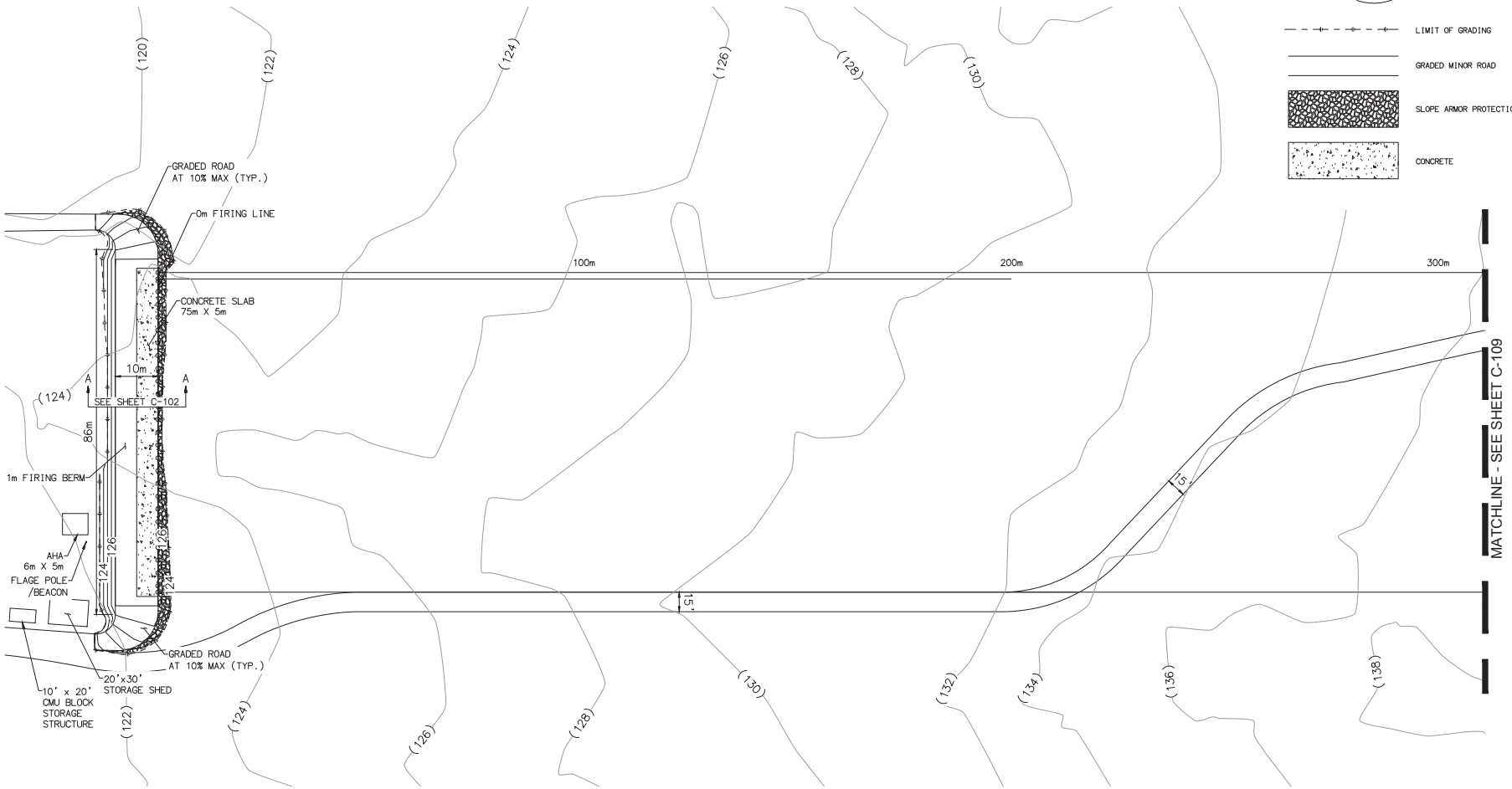
GMHA, 201309



LEGEND

- EX. CONTOURS
- PROP. CONTOURS
- LIMIT OF GRADING
- GRADED MINOR ROAD
- SLOPE ARMOR PROTECTION
- CONCRETE

NOTES:

1. LATERAL LIMIT MARKERS (LLM) PER ARMY TRAINING CIRCULAR FIGURE B-69. A SINGLE LEFT AND RIGHT LLM TO BE PLACED AT END OF RANGE AND SIZED PER THE ARMY TRAINING CIRCULAR. LEFT LLM TO BE BLACK AND WHITE. RIGHT LLM TO BE BLACK AND RED. SEE SHEET C-109.

600M UNKNOWN DISTANCE RANGE GRADING PLAN

SCALE: 1" = 40'

SCALE: 1"=40'

SYM	DESCRIPTION	DATE	APP
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RBF CONSULTING

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FOR COMMANDER NAVFAC

ACTIVITY

SATISFACTORY TO DATE DD/MM/YY

DES XX DRW XX CHK XXX

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BRANCH MANAGER XX

CHIEF ENG/ARCH XX

GOV FPE XX

REVIEWER XX

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
CORONADO, CA
NAVAL SPECIAL WAREFARE COMMAND
NILAND, CA
NAVAL AMPHIBIOUS BASE
SPECIAL WARFARE AREA TRAINING 4 & 5
TRAINING RANGE PROJECT
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE
600M UNKNOWN DISTANCE RANGE GRADING PLAN

SCALE: AS NOTED

EPROJECT NO.: X

CONSTR. CONTR. NO. X

NAVFAC DRAWING NO. ---

SHEET 11 OF X

C-108

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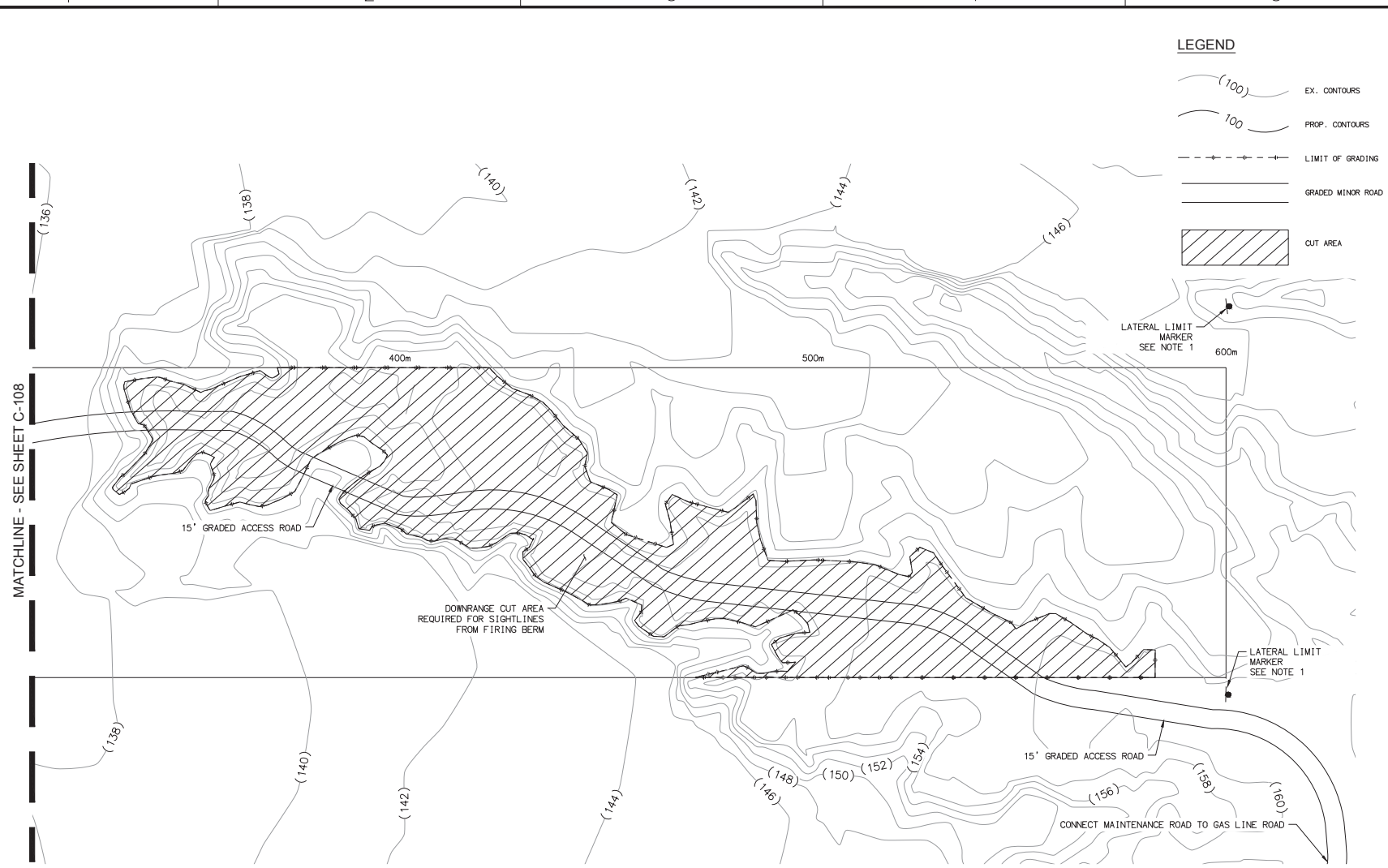

NOTES:

1. LATERAL LIMIT MARKERS (LLM) PER ARMY TRAINING CIRCULAR FIGURE B-69. A SINGLE LEFT AND RIGHT LLM TO BE PLACED AT END OF RANGE AND SIZED PER THE ARMY TRAINING CIRCULAR. LEFT LLM TO BE BLACK AND WHITE. RIGHT LLM TO BE BLACK AND RED.

600M UNKNOWN DISTANCE RANGE GRADING PLAN

SCALE: 1" = 40'

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FOR COMMANDER NAVFAC

ACTIVITY

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DES XX DRW XX CHK XXX

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BRANCH MANAGER XX

CHIEF ENG/ARCH XX

GOV FPE XX

REVIEWER XX

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
CORONADO, CA
NAVAL SPECIAL WAREFARE COMMAND
NILAND, CA
SPECIAL WARFARE AREA TRAINING 4 & 5
TRAINING RANGE PROJECT
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE
600M UNKNOWN DISTANCE RANGE GRADING PLAN

SCALE: AS NOTED

EPROJECT NO.: X

CONSTR. CONTR. NO. X

NAVFAC DRAWING NO. – – – –

SHEET 12 OF X

C-109

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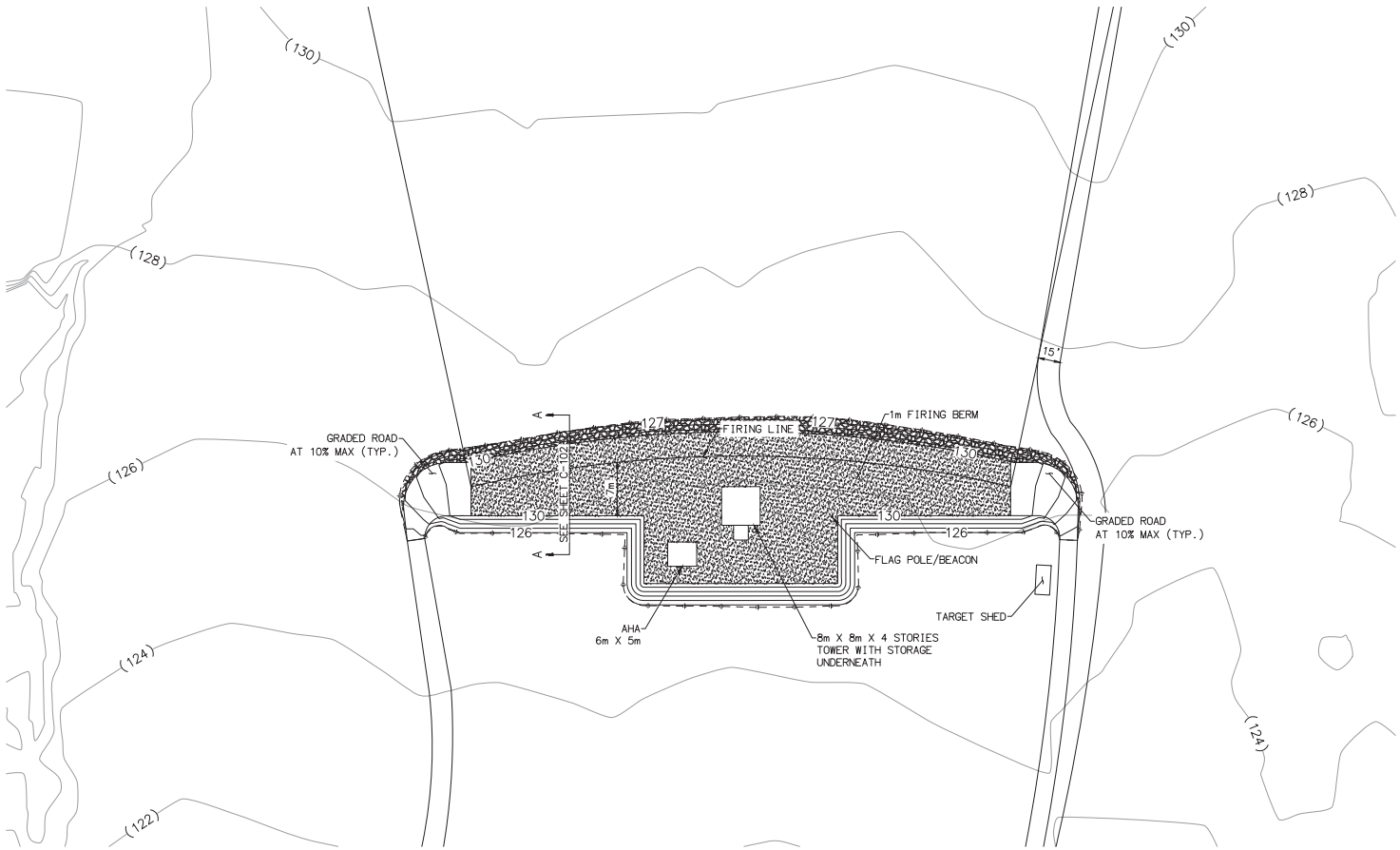

LEGEND

- (100) EX. CONTOURS
- 100 PROP. CONTOURS
- LIMIT OF GRADING
- GRADED MINOR ROAD
- SLOPE ARMOR PROTECTION
- DECOMPOSED GRANITE

NOTES:

1. LATERAL LIMIT MARKERS (LLM) PER ARMY TRAINING CIRCULAR FIGURE B-69. A SINGLE LEFT AND RIGHT LLM TO BE PLACED AND SIZED PER THE ARMY TRAINING CIRCULAR. LEFT LLM TO BE BLACK AND WHITE. RIGHT LLM TO BE BLACK AND RED. SEE SHEET C-100.2 FOR LOCATION.

SCALE: 1"=40'

40 20 0 40 80 120

SCALE: 1"=40'

MULTI-PURPOSE MACHINE GUN RANGE GRADING PLAN

SCALE: 1" = 40'

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1	X	00/00/00	X

APPROVED

FOR COMMANDER NAVFAC

ACTIVITY

SATISFACTORY TO DATE DD/MM/YY

DES XX DRW XX CHK XXX

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BRANCH MANAGER XX

CHIEF ENG/ARCH XX

GOV FPE XX

REVIEWER XX

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
CORONADO, CA
NAVAL AMPHIBIOUS BASE
SPECIAL WARFARE AREA TRAINING 4 & 5
NILAND, CA
TRAINING RANGE PROJECT
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE
MULTI-PURPOSE MACHINE GUN RANGE GRADING PLAN

SCALE: AS NOTED

EPROJECT NO.: X

CONSTR. CONTR. NO. X

NAVFAC DRAWING NO. — — — —

SHEET 13 OF X

C-110

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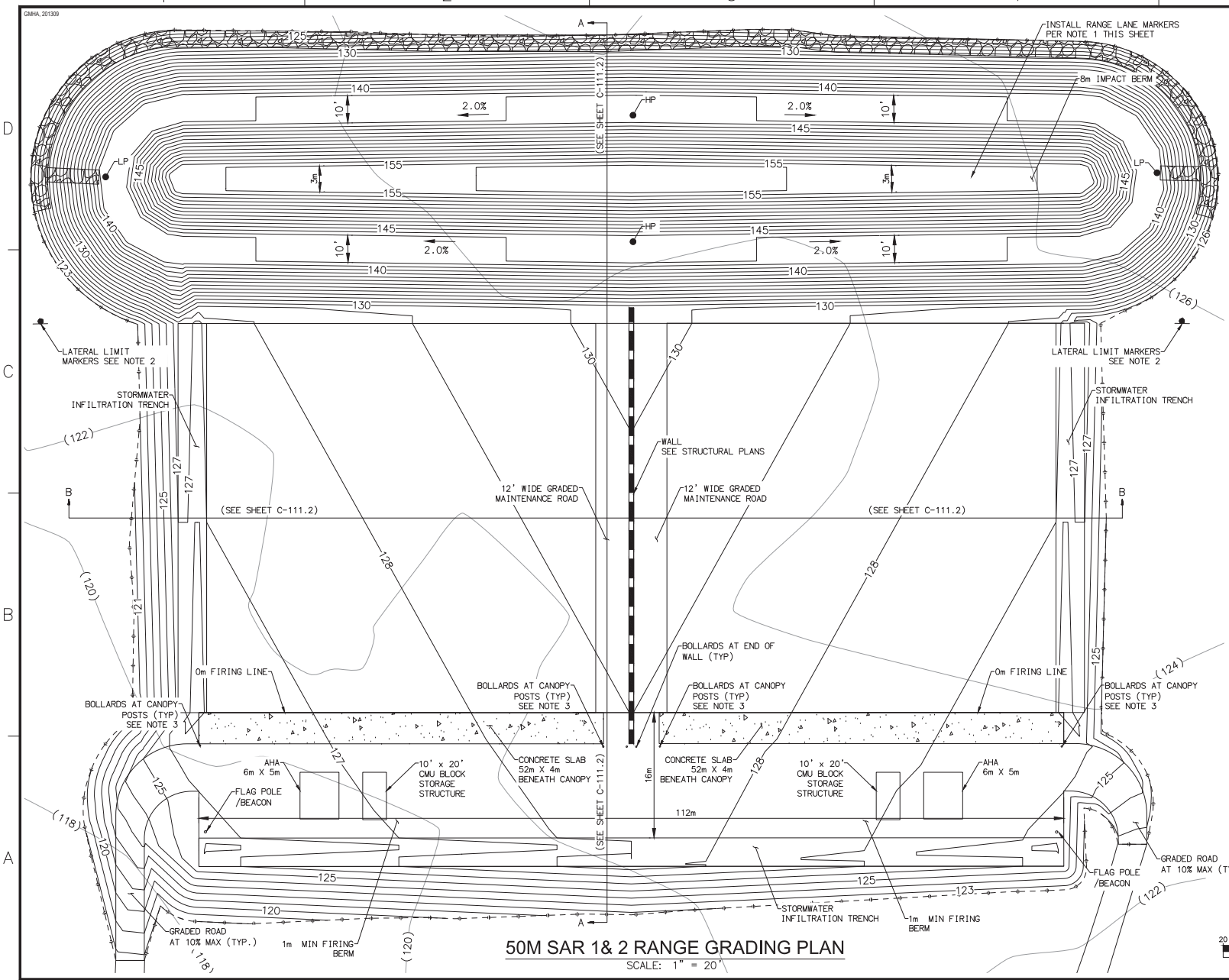

LEGEND

- EX. CONTOURS
- PROP. CONTOURS
- LIMIT OF GRADING
- GRADED ROAD
- SLOPE ARMOR PROTECTION
- CONCRETE

NOTES:

1. INSTALL RANGE LANE MARKERS PER ARMY TRAINING CIRCULAR (TC) 25-8 FIGURE B-67.
2. LATERAL LIMIT MARKERS (LLM) PER ARMY TRAINING CIRCULAR FIGURE B-69. A SINGLE LEFT AND RIGHT LLM TO BE PLACED AT END OF RANGE AND SIZED PER THE ARMY TRAINING CIRCULAR. LEFT LLM TO BE BLACK AND WHITE. RIGHT LLM TO BE BLACK AND RED.
3. PROVIDE 1 BOLLARD AT EACH END POST OF CANOPY AND A BOLLARD AT EVERY THIRD INTERIOR CANOPY POST.

50M SAR 1& 2 RANGE GRADING PLAN

SCALE: 1" = 20'

SCALE: 1"=20'

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					DATE

APPROVED

FOR COMMANDER NAVFAC

ACTIVITY

SATISFACTORY TO DATE DD/MM/YY

DES XX DRW XX CHK XXX

<<PM/DM>> XX

BRANCH MANAGER XX

CHIEF ENG/ARCH XX

GOV FPE XX

REVIEWER XX

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND

NAVAL SPECIAL WAREFARE COMMAND CORONADO, CA

NAVAL AMPHIBIOUS BASE NILAND, CA

SPECIAL WARFARE AREA TRAINING 4 & 5

TRAINING RANGE PROJECT

CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE

50M SAR 1& 2 RANGE GRADING PLAN

SCALE: AS NOTED

EPROJECT NO.: X

CONSTR. CONTR. NO. X

NAVFAC DRAWING NO. – – – –

SHEET 14 OF X

C-111.1

GMHA, 201309

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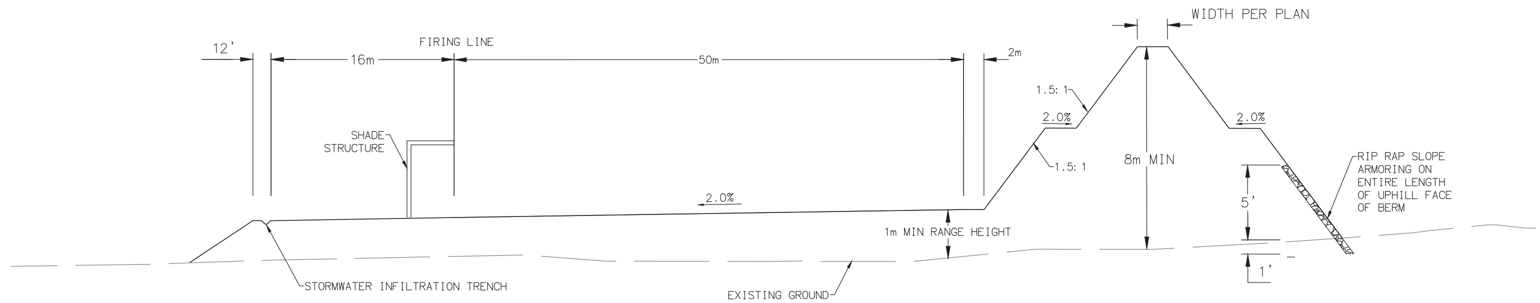
GMHA, 201309



SECTION A-A (SEE SHEET C-111.1)

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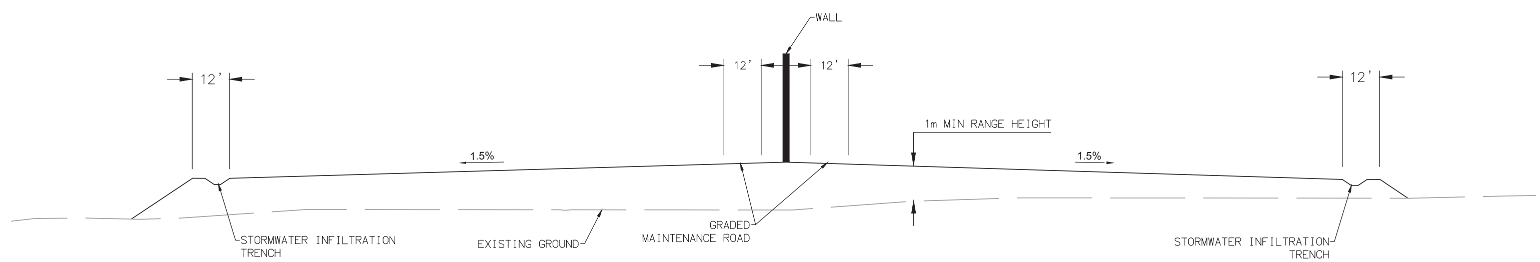

SECTION B-B (SEE SHEET C-111.1)

NOT TO SCALE

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FOR COMMANDER NAVFAC

ACTIVITY –

SATISFACTORY TO DATE DD/MM/YY

DES XX DRW XX CHK XXX

<<PM/DM>> XX

BRANCH MANAGER XX

CHIEF ENG/ARCH XX

GOV FPE XX

REVIEWER XX

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL SPECIAL WARFARE COMMAND
NAVAL AMPHIBIOUS BASE CORONADO, CA
SPECIAL WARFARE AREA TRAINING 4 & 5 NILAND, CA
TRAINING RANGE PROJECT
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE
50M SAR 1& 2 RANGE CROSS SECTIONS

SCALE: AS NOTED

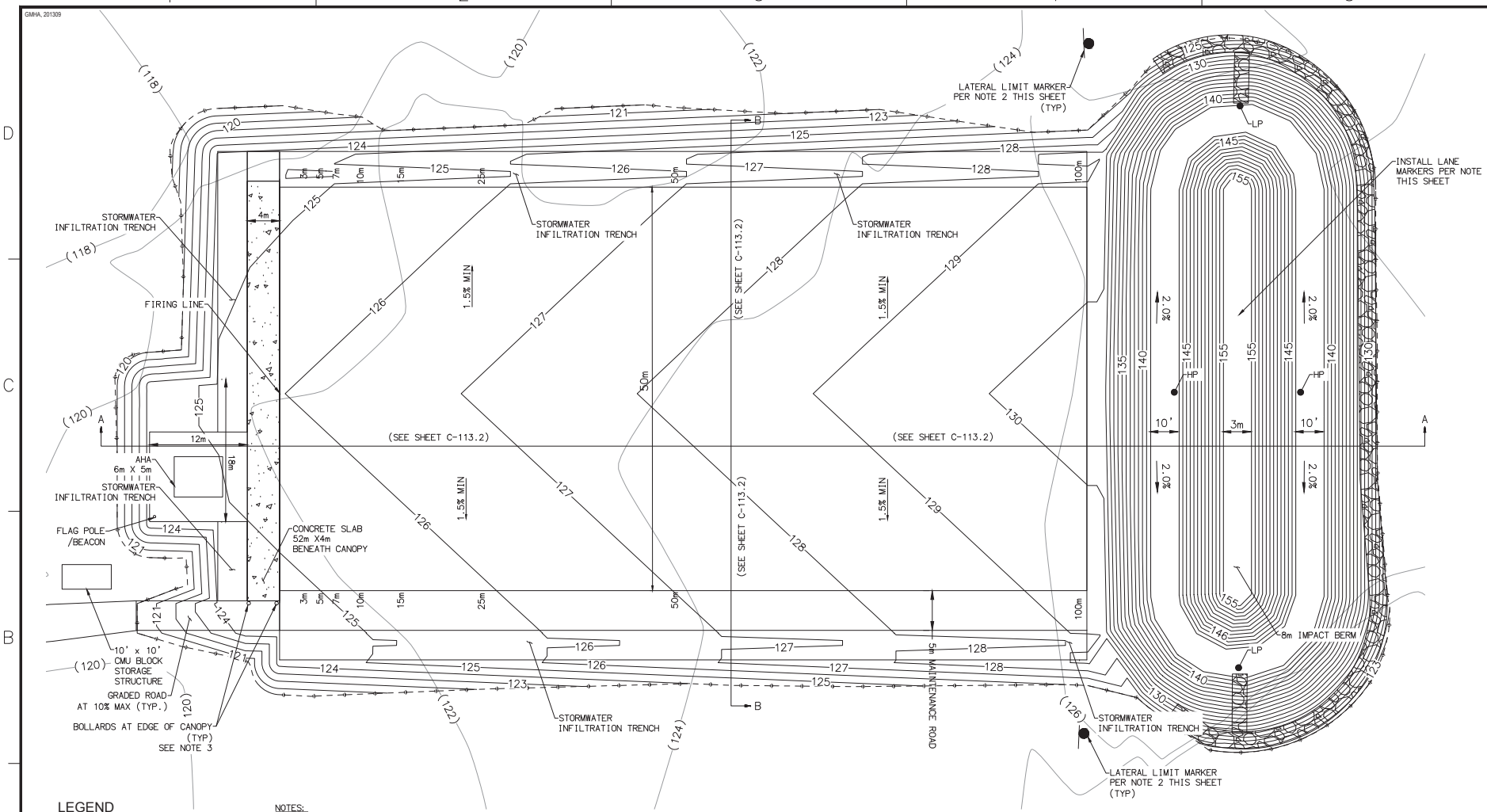
EPROJECT NO.: X

CONSTR. CONTR. NO. X

NAVFAC DRAWING NO. – – – –

SHEET 15 OF X

C-111.2



LEGEND

GRADED MINOR ROAD

CONCRETE

NOTES:

1. INSTALL RANGE LANE MARKERS PER ARMY TRAINING CIRCULAR (TC) 25-8 FIGURE B-67.
2. LATERAL LIMIT MARKERS (LLM) PER ARMY TRAINING CIRCULAR FIGURE B-69. A SINGLE LEFT AND RIGHT LLM TO BE PLACED AT END OF RANGE AND SIZED PER THE ARMY TRAINING CIRCULAR. LEFT LLM TO BE BLACK AND WHITE. RIGHT LLM TO BE BLACK AND RED.
3. PROVIDE 1 BOLLARD AT EACH END POST OF CANOPY ADJACENT TO GRADED ROAD.

100M SAR 1 RANGE GRADING PLAN

SCALE: 1" = 20'

SCALE: 1"=20'

DEPARTMENT OF THE NAVY
NAVAL SPECIAL WAREFARE COMMAND
NAVAL AMPHIBIOUS BASE
SPECIAL WARFARE AREA TRAINING 4 & 5
NAVAL FACILITIES ENGINEERING COMMAND
CORONADO, CA
NILAND, CA
TRAINING RANGE PROJECT
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE
100M SAR 1 RANGE GRADING PLAN

SCALE: AS NOTED
EPROJECT NO.: X
CONSTR. CONTR. NO. X
NAVFAC DRAWING NO. ---
SHEET 16 OF X

C-112

APPROVED
FOR COMMANDER NAVFAC
ACTIVITY
SATISFACTORY TO DATE DD/MM/YY
DES XX DRW XX CHK XXX
BRANCH MANAGER XX
CHIEF ENG/ARCH XX
GOV FPE XX
REVIEWER XX

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GMHA, 201309

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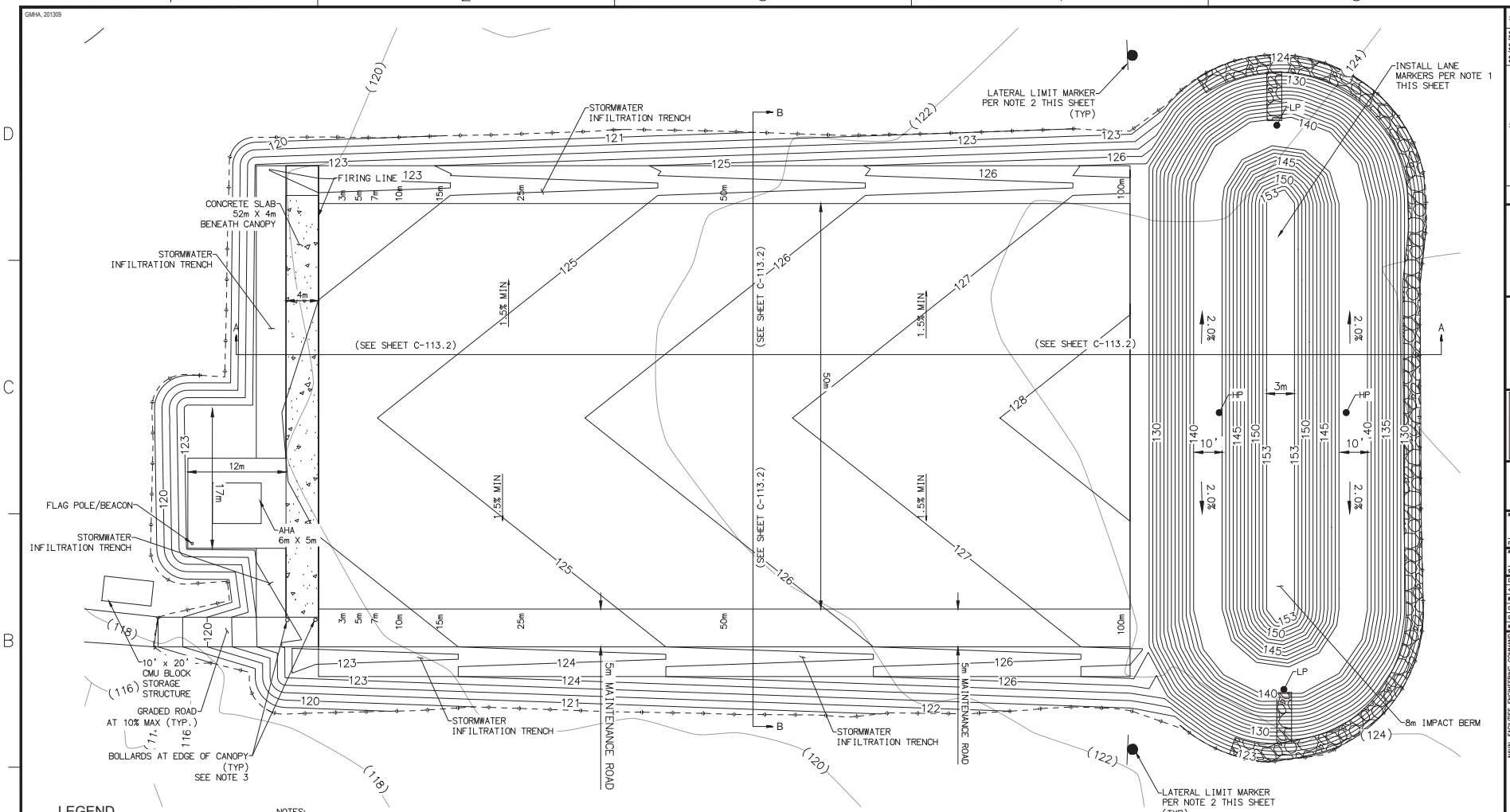

LEGEND

GRADED MINOR ROAD

CONCRETE

NOTES:

1. INSTALL RANGE LANE MARKERS PER ARMY TRAINING CIRCULAR (TC) 25-8 FIGURE B-67.
2. LATERAL LIMIT MARKERS (LLM) PER ARMY TRAINING CIRCULAR FIGURE B-69. A SINGLE LEFT AND RIGHT LLM TO BE PLACED AT END OF RANGE AND SIZED PER THE ARMY TRAINING CIRCULAR. LEFT LLM TO BE BLACK AND WHITE. RIGHT LLM TO BE BLACK AND RED.
3. PROVIDE 1 BOLLARD AT EACH END POST OF CANOPY ADJACENT TO GRADED ROAD.

100M SAR 2 RANGE GRADING PLAN

SCALE: 1" = 20'

I	SYM	DESCRIPTION	DATE	APP
X			00/00/00	X

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
CORONADO, CA
NAVAL AMPHIBIOUS BASE NILAND, CA
SPECIAL WARFARE AREA TRAINING 4 & 5
TRAINING RANGE PROJECT
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE
100M SAR 2 RANGE GRADING PLAN

RBF CONSULTING

APPROVED
FOR COMMANDER NAVFAC
ACTIVITY
SATISFACTORY TO DATE DD/MM/YY
DES XX DRW XX CHK XXX
<<PM/DM>> XX
BRANCH MANAGER XX
CHIEF ENG/ARCH XX
GOV FPE XX
REVIEWER XX

SCALE: AS NOTED
EPROJECT NO.: X
CONSTR. CONTR. NO. X
NAVFAC DRAWING NO. ----
SHEET 17 OF X

C-113.1

GMHA, 201309

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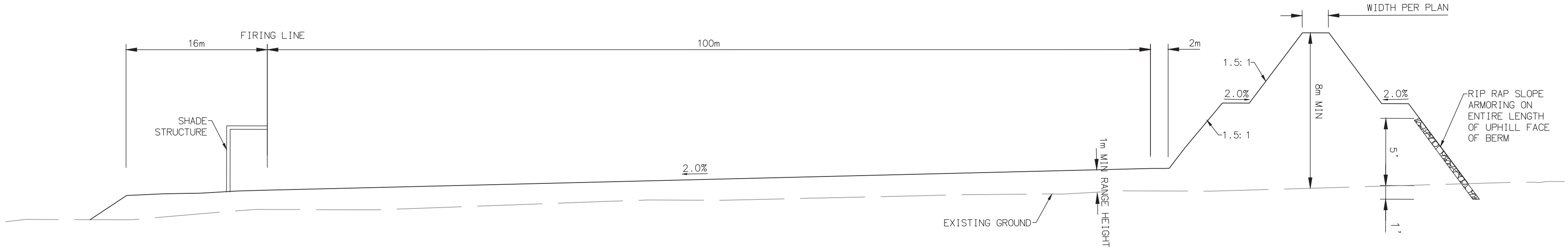
GMHA, 201309



SECTION A-A (SEE SHEET C-112 AND C-113.1)

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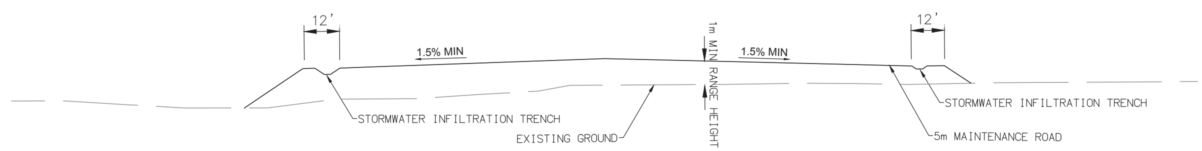

SECTION B-B (SEE SHEET C-112 AND C-113.1)

NOT TO SCALE

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RBF CONSULTING
A [redacted] Company

APPROVED

FOR COMMANDER NAVFAC

ACTIVITY

SATISFACTORY TO DATE DD/MM/YY

DES XX DRW XX CHK XXX

<<PM/DM>> XX

BRANCH MANAGER XX

CHIEF ENG/ARCH XX

GOV FPE XX

REVIEWER XX

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL SPECIAL WARFARE COMMAND
NAVAL AMPHIBIOUS BASE CORONADO, CA
SPECIAL WARFARE AREA TRAINING 4 & 5 NILAND, CA
TRAINING RANGE PROJECT
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE
100M SAR RANGE CROSS SECTIONS

SCALE: AS NOTED

EPROJECT NO.: X

CONSTR. CONTR. NO. X

NAVFAC DRAWING NO. ----

SHEET 18 OF X

C-113.2

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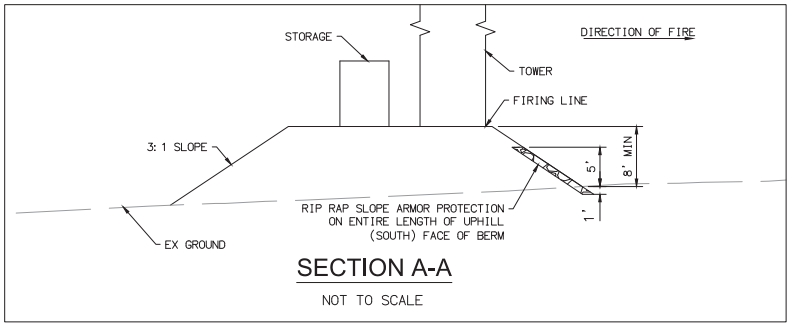
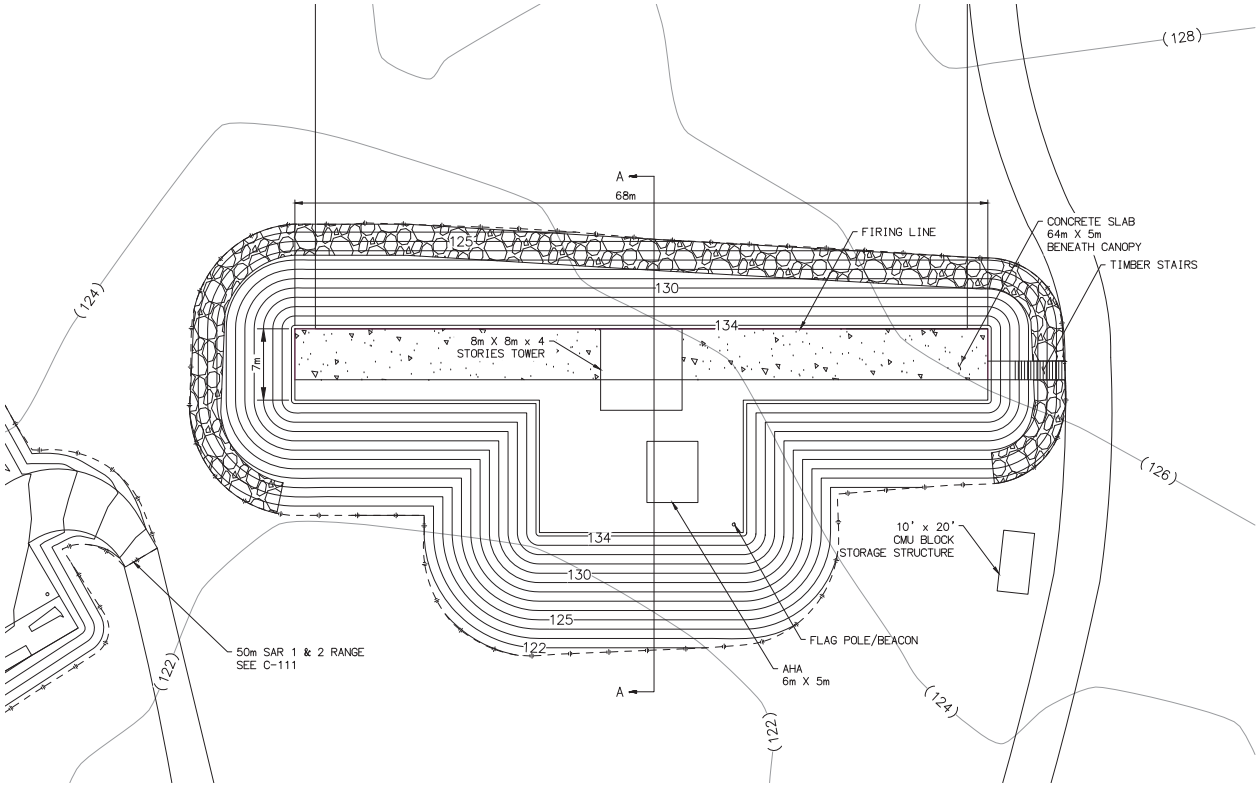


SECTION A-A

NOT TO SCALE



2000M KNOWN DISTANCE SNIPER RANGE GRADING PLAN

SCALE: 1" = 20'

LEGEND

GRADED ROAD

CONCRETE

SLOPE ARMOR PROTECTION

NOTES:

1. LATERAL LIMIT MARKERS (LLM) PER ARMY TRAINING CIRCULAR FIGURE B-69. A SINGLE LEFT AND RIGHT LLM TO BE PLACED AND SIZED PER THE ARMY TRAINING CIRCULAR. LEFT LLM TO BE BLACK AND WHITE. RIGHT LLM TO BE BLACK AND RED. SEE SHEET C-100.2 FOR LOCATION.
2. INCLUDE DISTANCE MARKERS UP TO 1000m

SCALE: 1"=20'

20 10 0 20 40 60

SCALE: 1"=20'

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–								SYM

APPROVED

FOR COMMANDER NAVFAC

ACTIVITY

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SATISFACTORY TO DATE DD/MM/YY

DES XX	DRW XX	CHK XXX
<<PM/DM>>		XX
BRANCH MANAGER		XX
CHIEF ENG/ARCH		XX
GOV FPE		XX
REVIEWER		XX

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL SPECIAL WAREFARE COMMAND
CORONADO, CA
SPECIAL WARFARE AREA TRAINING 4 & 5
NILAND, CA
NAVAL AMPHIBIOUS BASE
TRAINING RANGE PROJECT
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE
2000M KNOWN DISTANCE SNIPER RANGE GRADING PLAN

SCALE: AS NOTED

EPROJECT NO.: X

CONSTR. CONTR. NO. X

NAVFAC DRAWING NO. – – – –

SHEET 19 OF X

C-114

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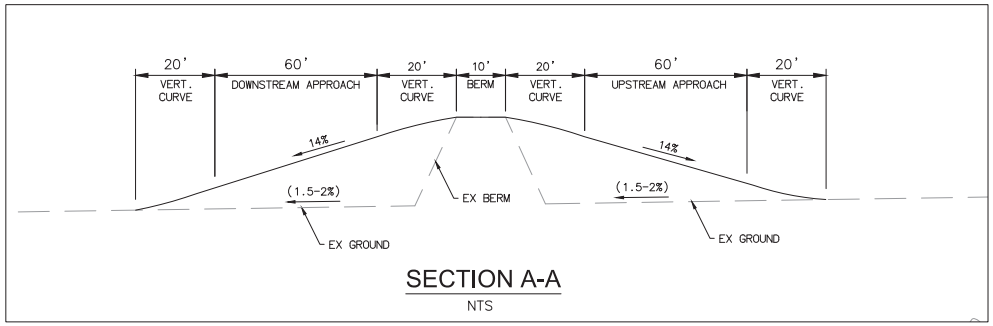
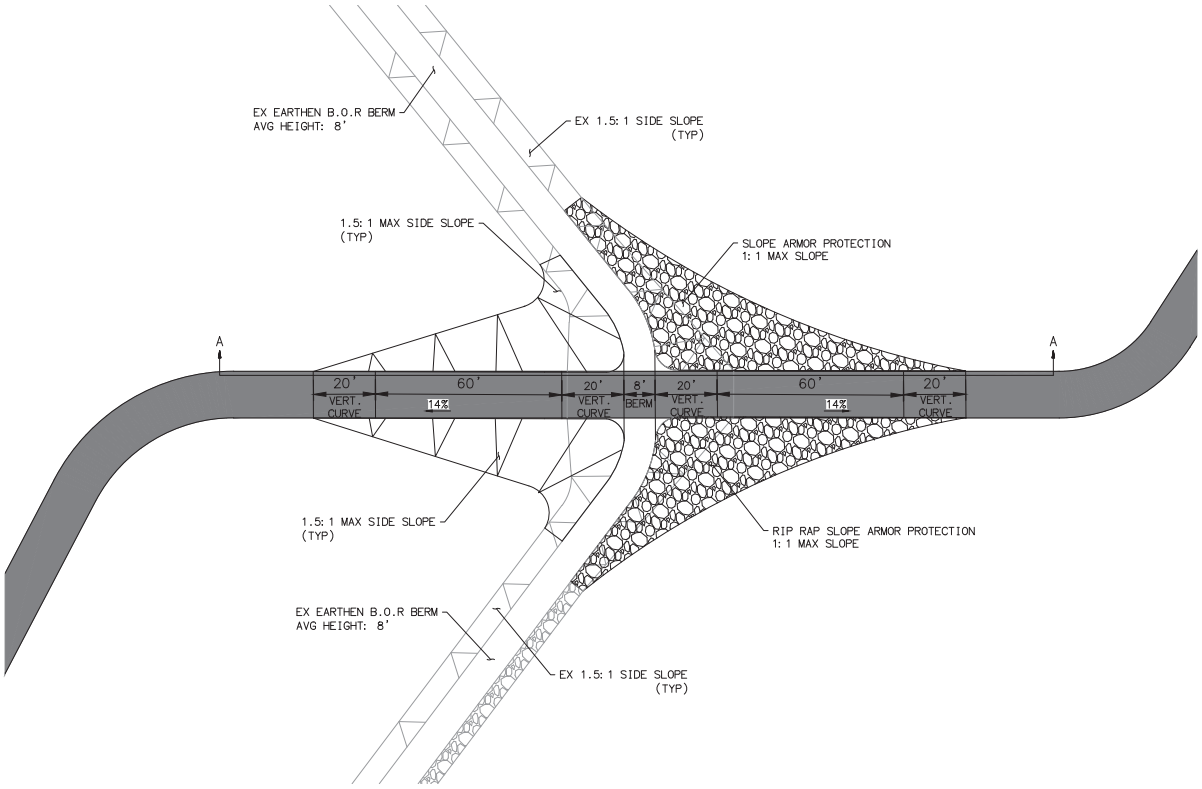
GMHA, 201309



SECTION A-A

NTS



UP-AND-OVER GRADING PLAN

SCALE: 1" = 20'

LEGEND

- GRADED MAJOR ROAD
- CONCRETE
- SLOPE ARMOR PROTECTION

SCALE: 1"=20'

SYM	DESCRIPTION	DATE	APP
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DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL SPECIAL WAREFARE COMMAND
CORONADO, CA
SPECIAL WARFARE AREA TRAINING 4 & 5
NAVAL AMPHIBIOUS BASE
NILAND, CA
TRAINING RANGE PROJECT
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE
UP-AND-OVER GRADING PLAN

RBF CONSULTING

APPROVED
FOR COMMANDER NAVFAC
ACTIVITY
SATISFACTORY TO DATE DD/MM/YY
DES XX DRW XX CHK XXX
<<PM/DM>> XX
BRANCH MANAGER XX
CHIEF ENG/ARCH XX
GOV FPE XX
REVIEWER XX

SCALE: AS NOTED
EPROJECT NO.: X
CONSTR. CONTR. NO. X
NAVFAC DRAWING NO. ----
SHEET 20 OF X

C-115

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APPENDIX D
DETAILED MAPS OF ALTERNATIVE 2

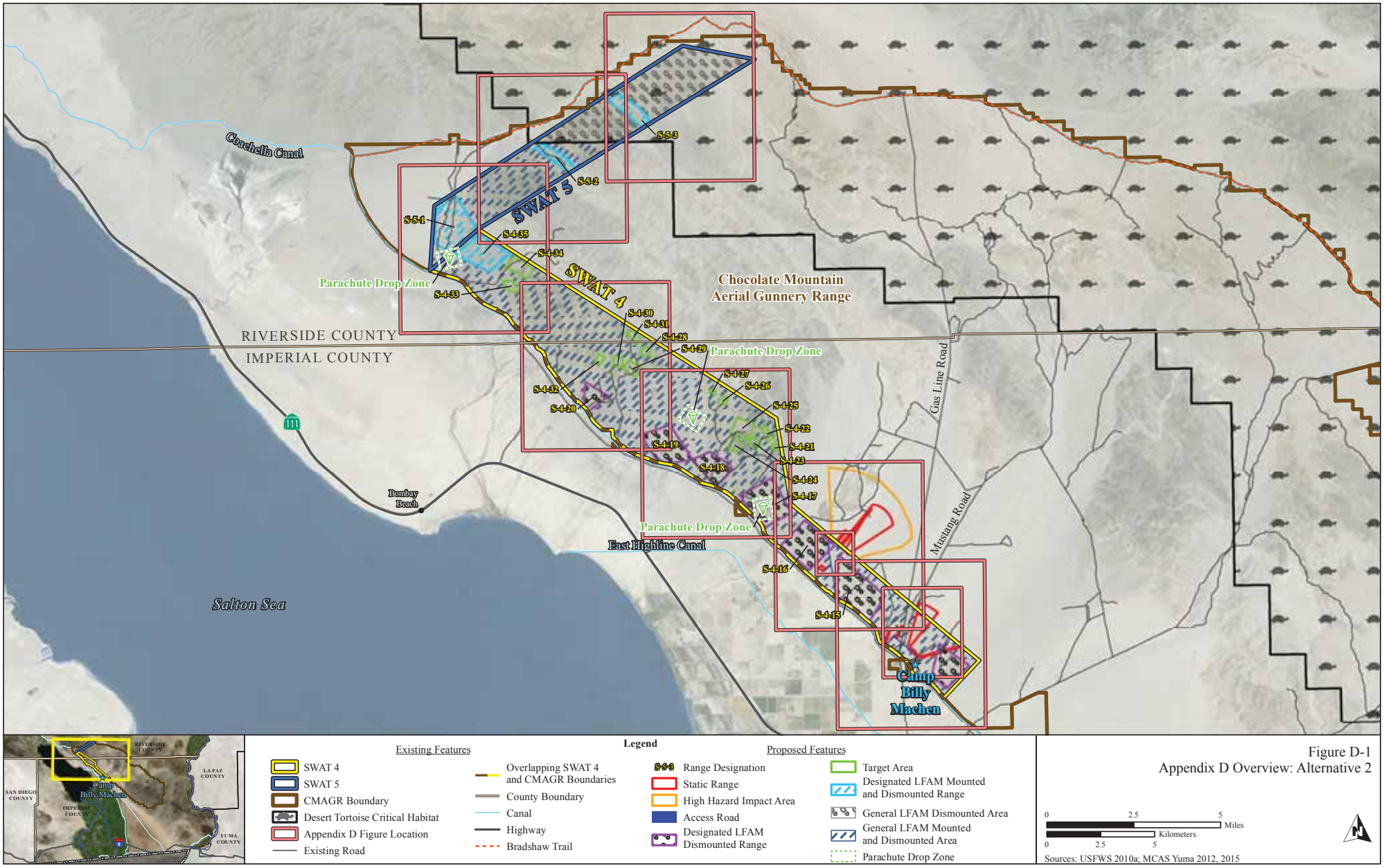
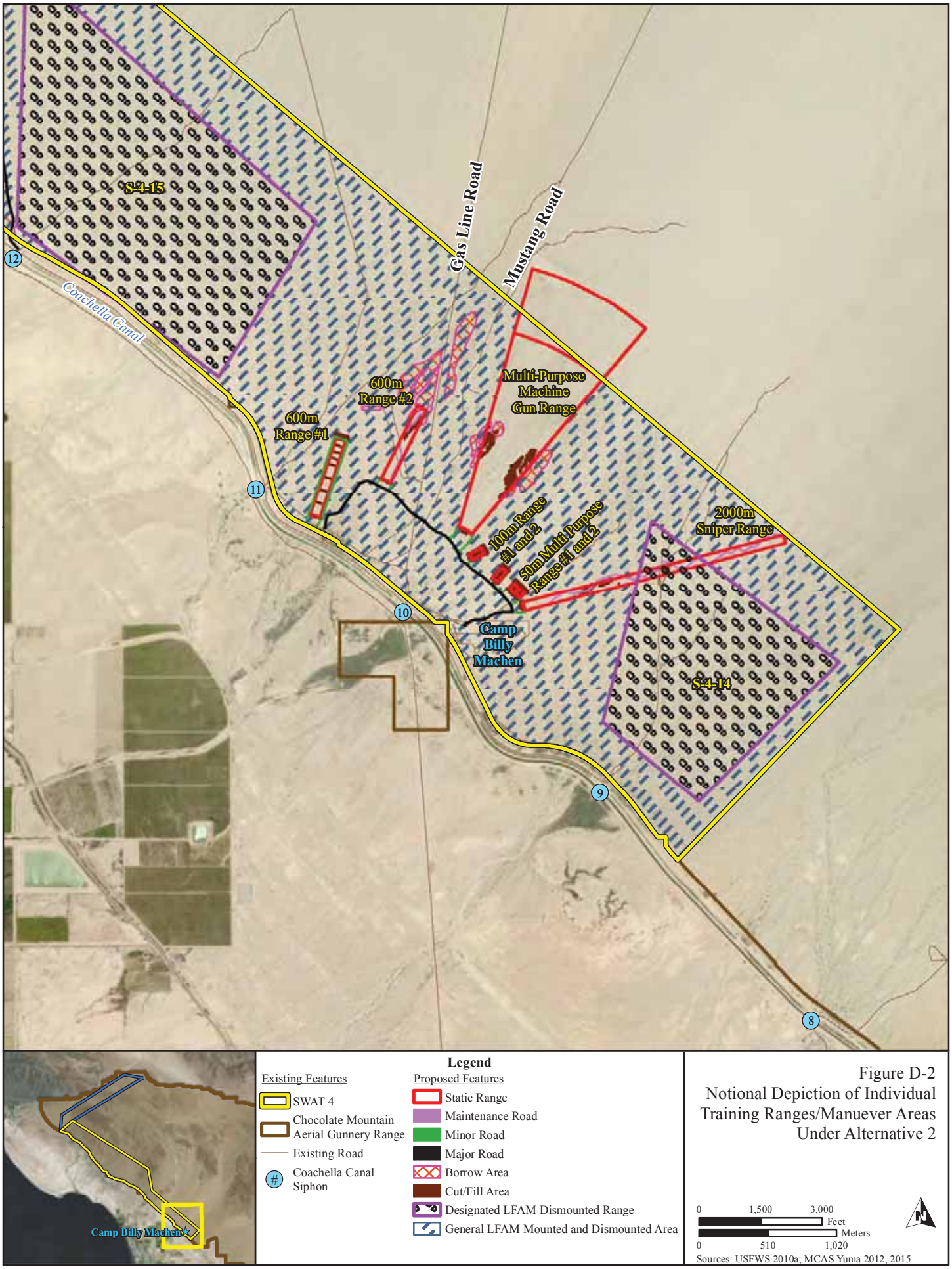


Figure D-1
Appendix D Overview: Alternative 2

Sources: USFWS 2010a; MCAS Yuma 2012, 2015



Sources: USFWS 2010a; MCAS Yuma 2012, 2015

Figure D-2
Notional Depiction of Individual Training Ranges/Manuever Areas Under Alternative 2

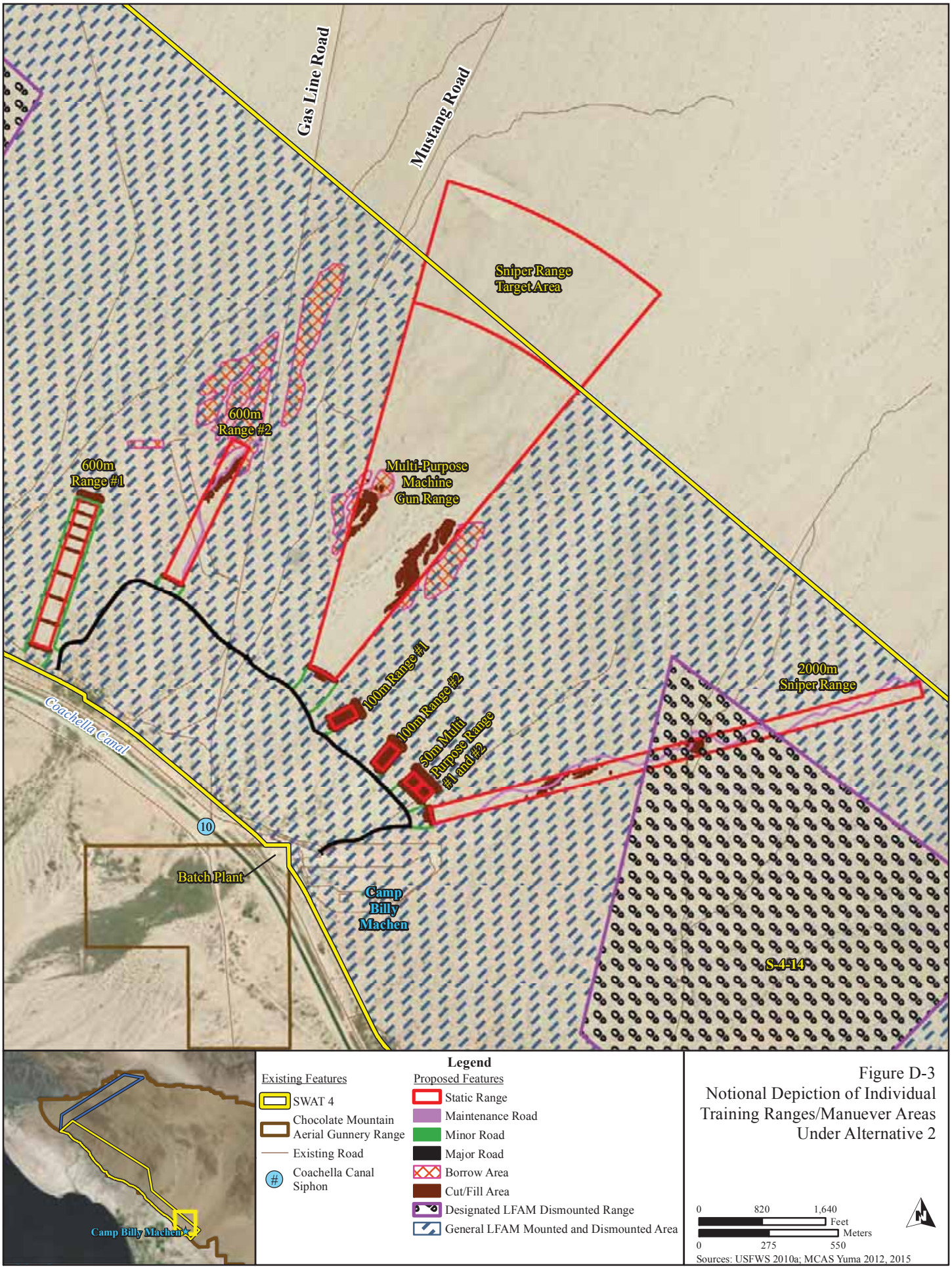


Figure D-3
Notional Depiction of Individual Training Ranges/Manuever Areas Under Alternative 2

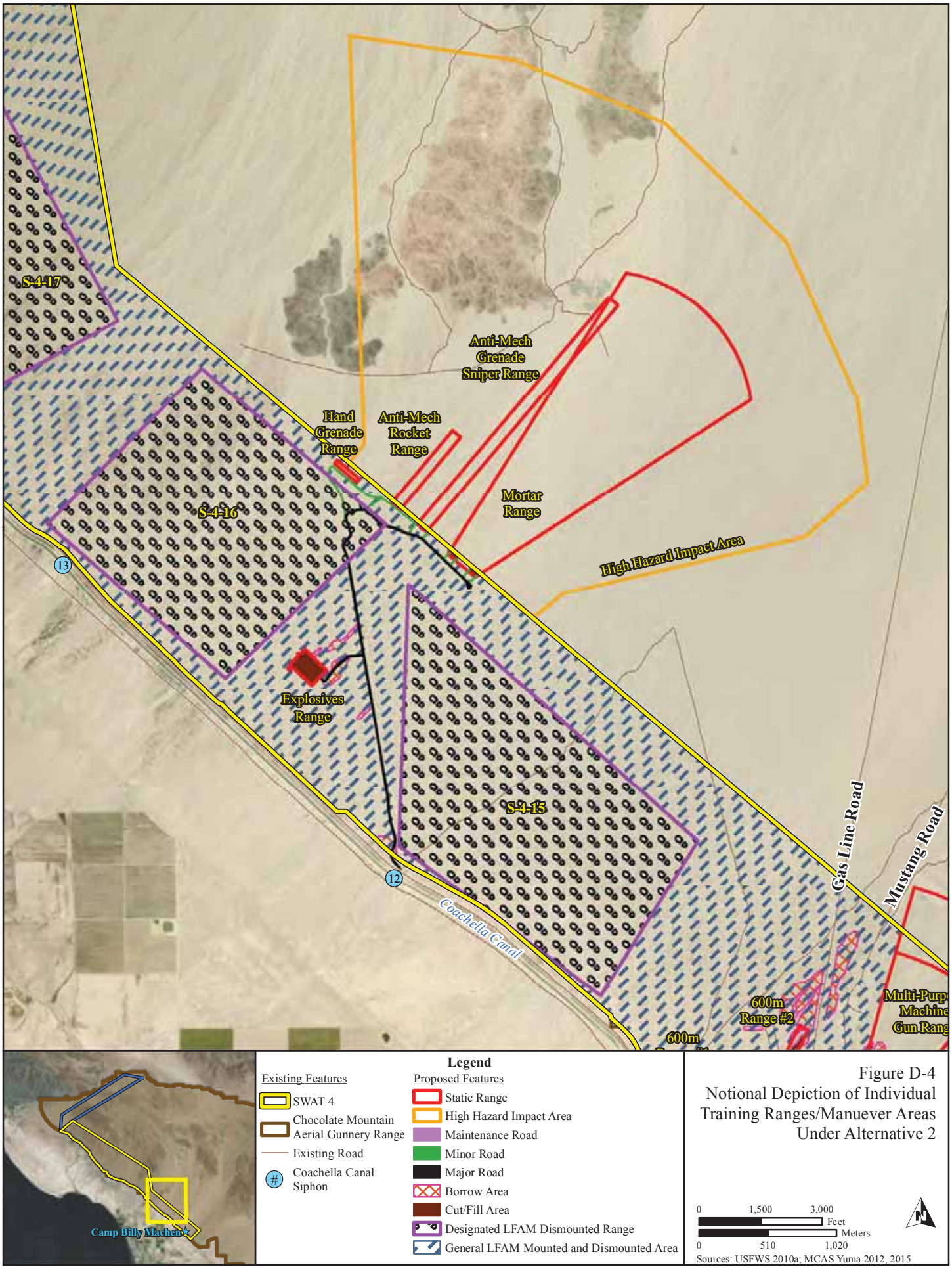


Figure D-4
Notional Depiction of Individual Training Ranges/Manuever Areas Under Alternative 2

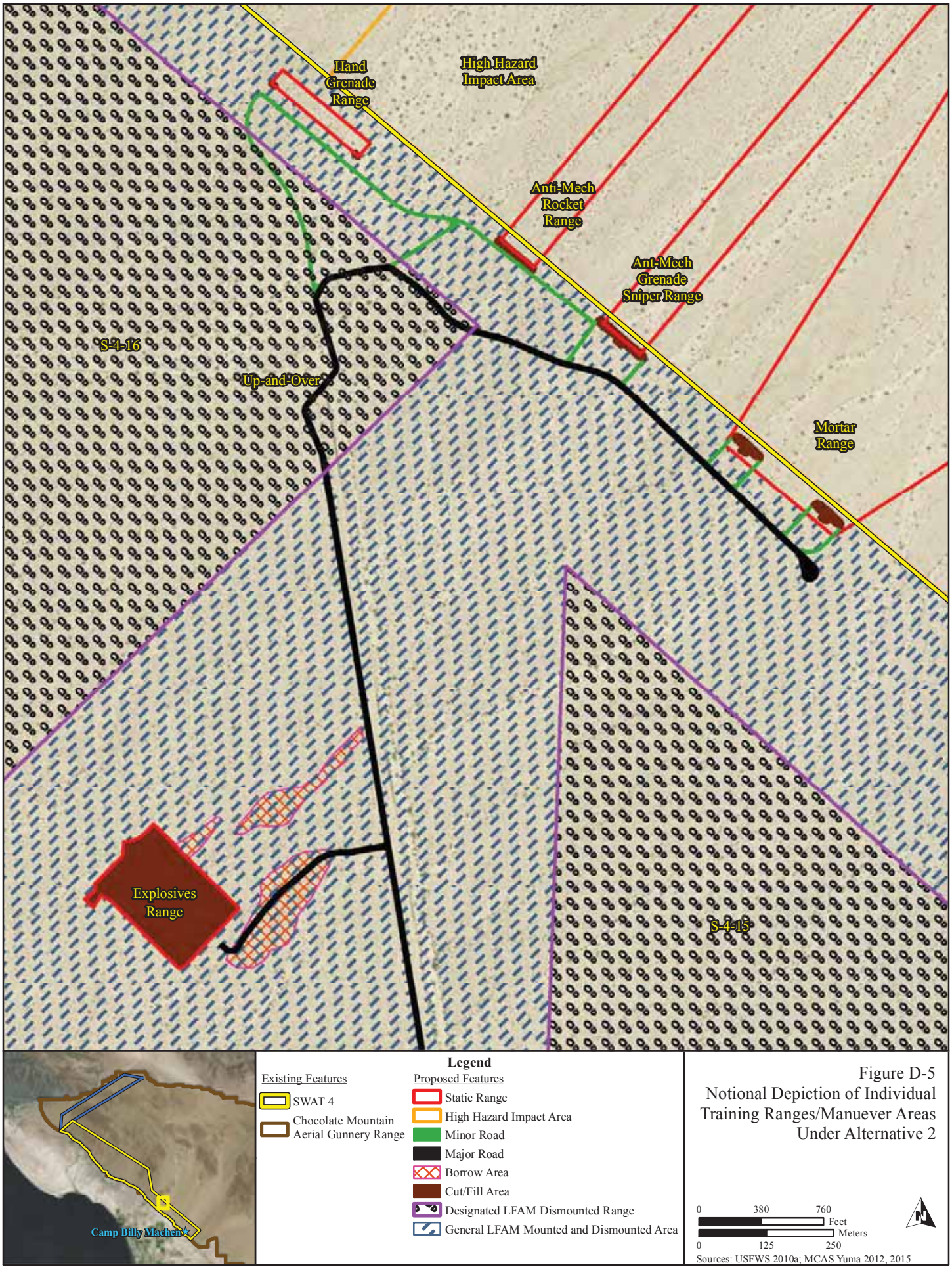


Figure D-5
Notional Depiction of Individual Training Ranges/Manuever Areas Under Alternative 2

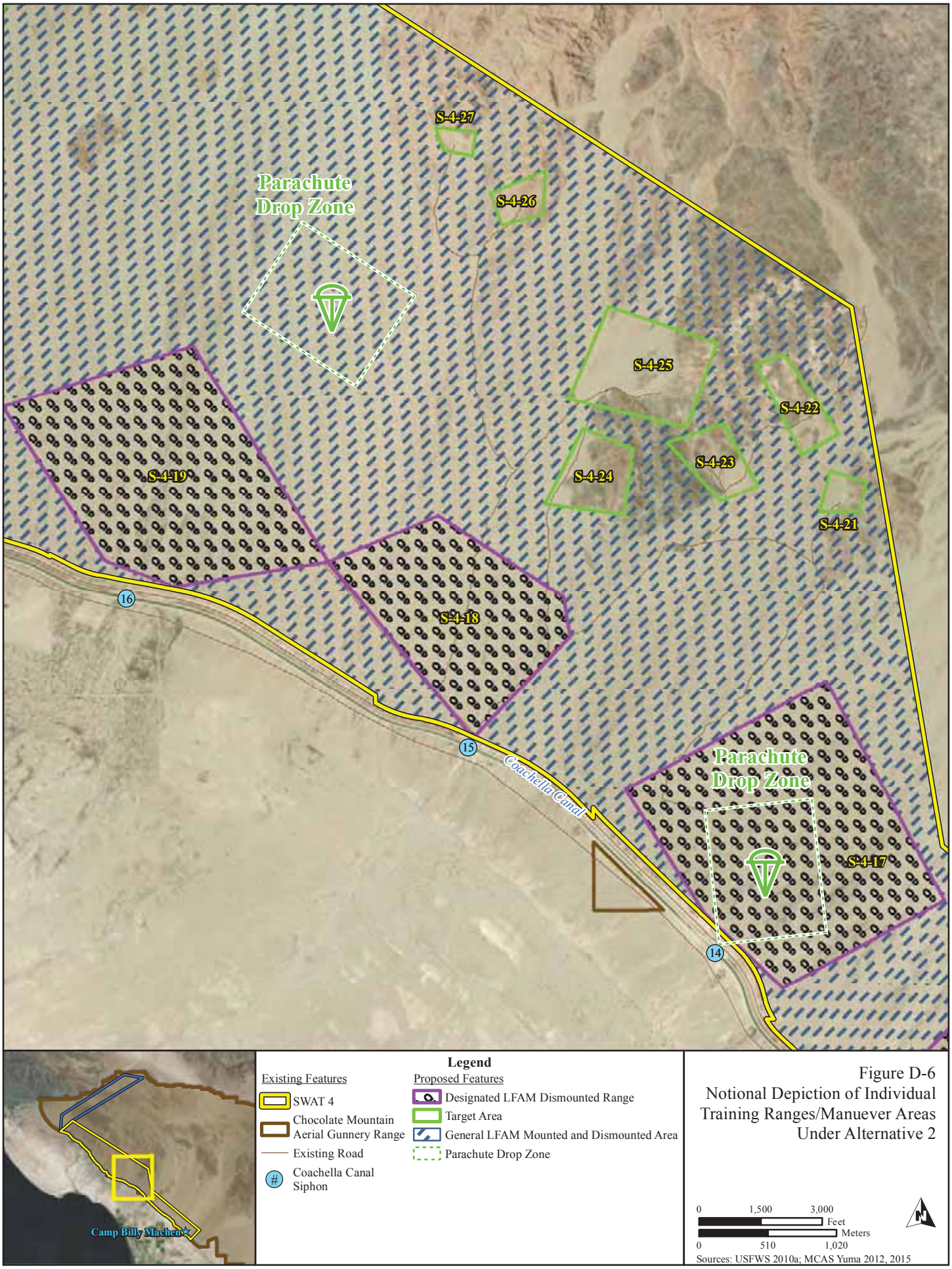


Figure D-6
Notional Depiction of Individual Training Ranges/Manuever Areas Under Alternative 2

Sources: USFWS 2010a; MCAS Yuma 2012, 2015

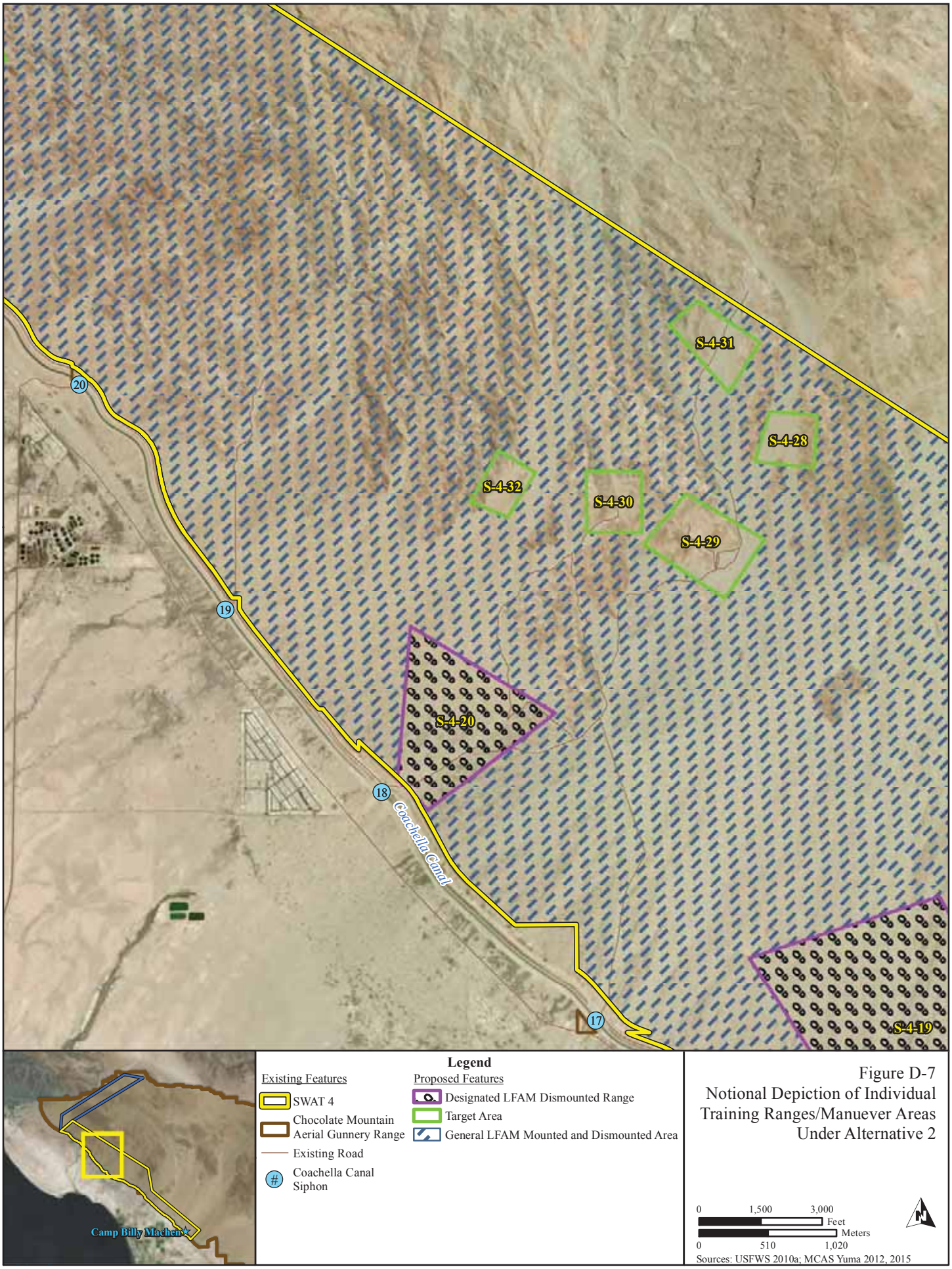
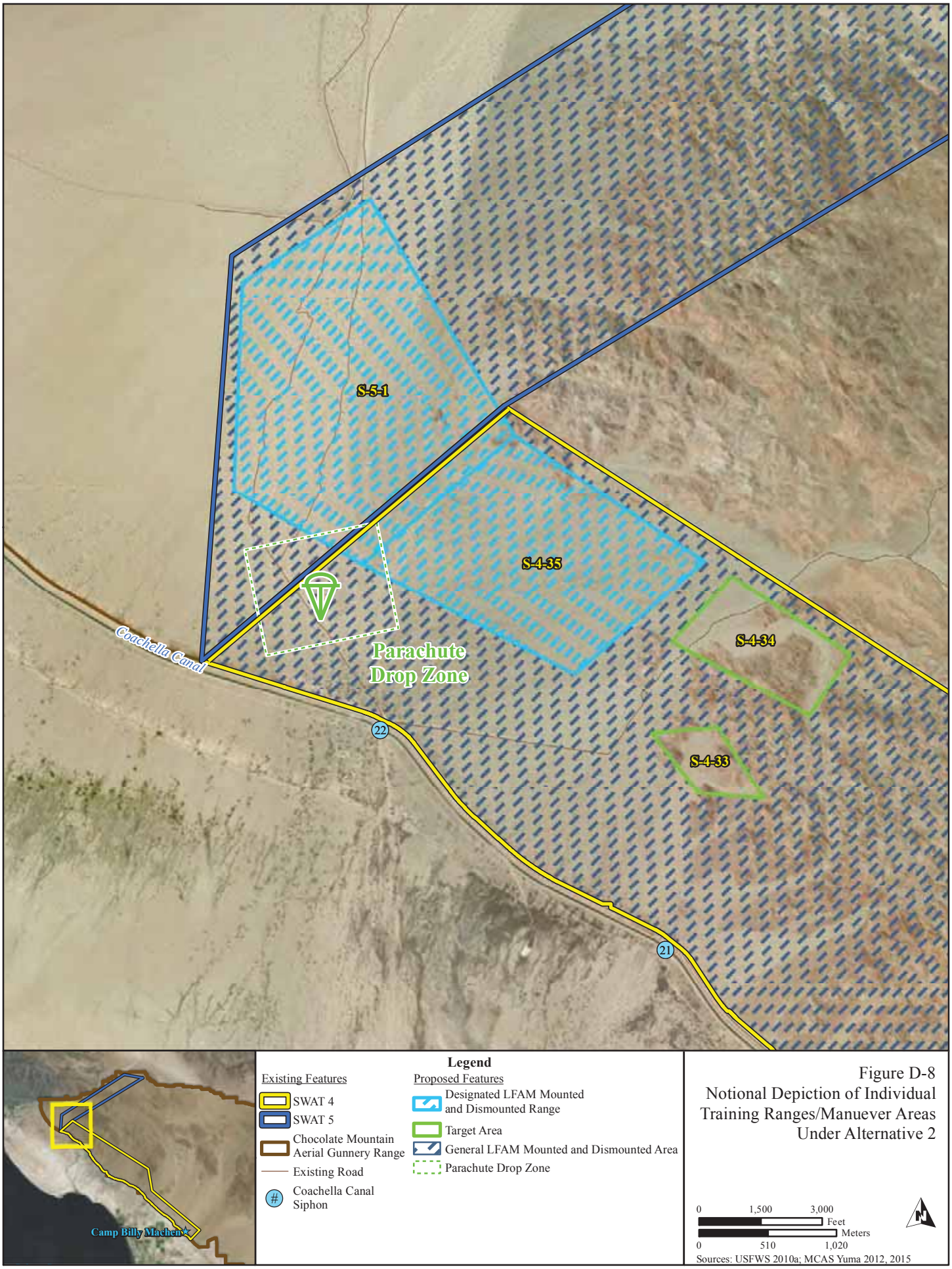


Figure D-7
Notional Depiction of Individual Training Ranges/Manuever Areas Under Alternative 2



Sources: USFWS 2010a; MCAS Yuma 2012, 2015

Figure D-8
Notional Depiction of Individual
Training Ranges/Manuever Areas
Under Alternative 2

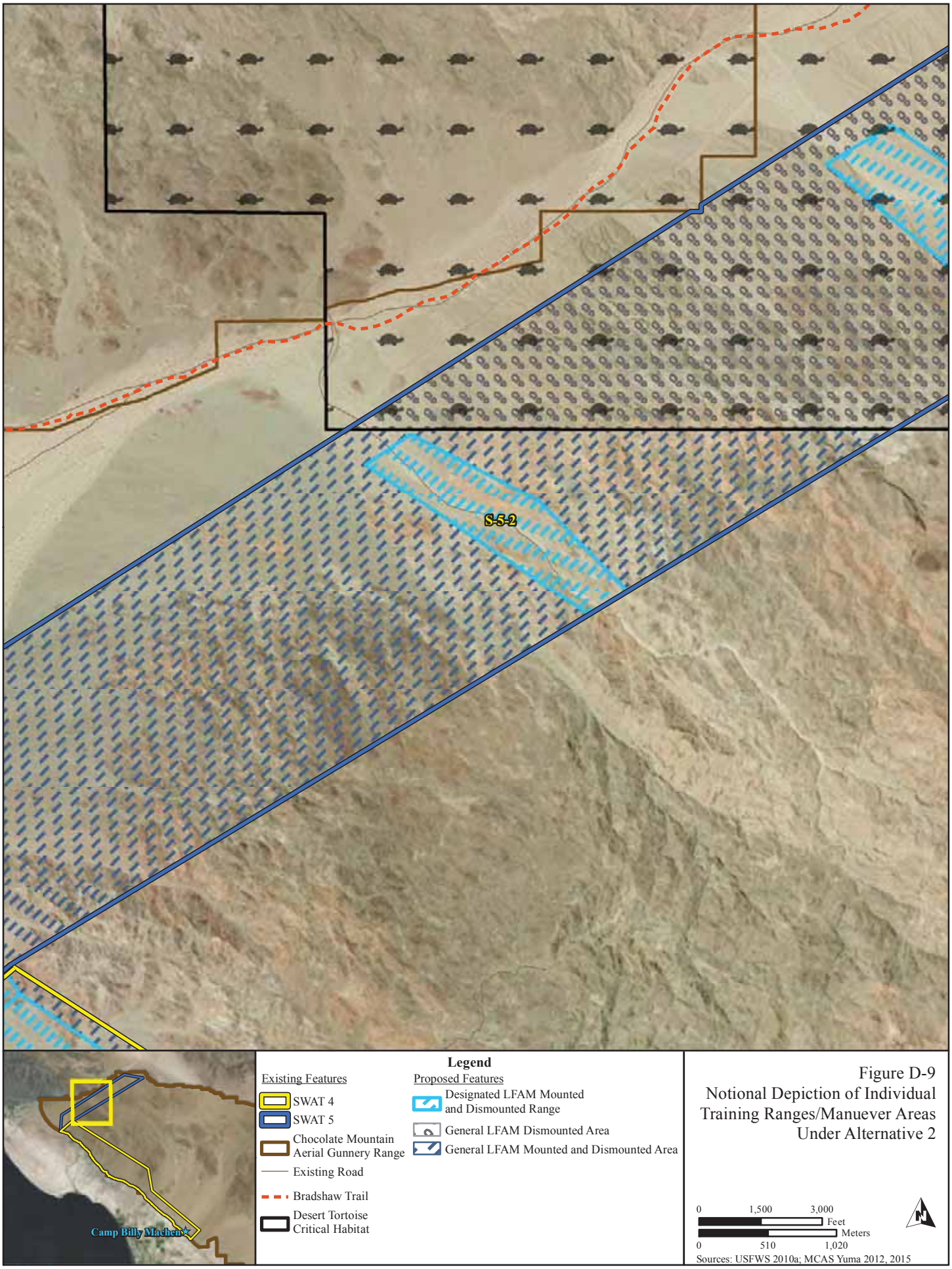


Figure D-9
Notional Depiction of Individual Training Ranges/Manuever Areas Under Alternative 2

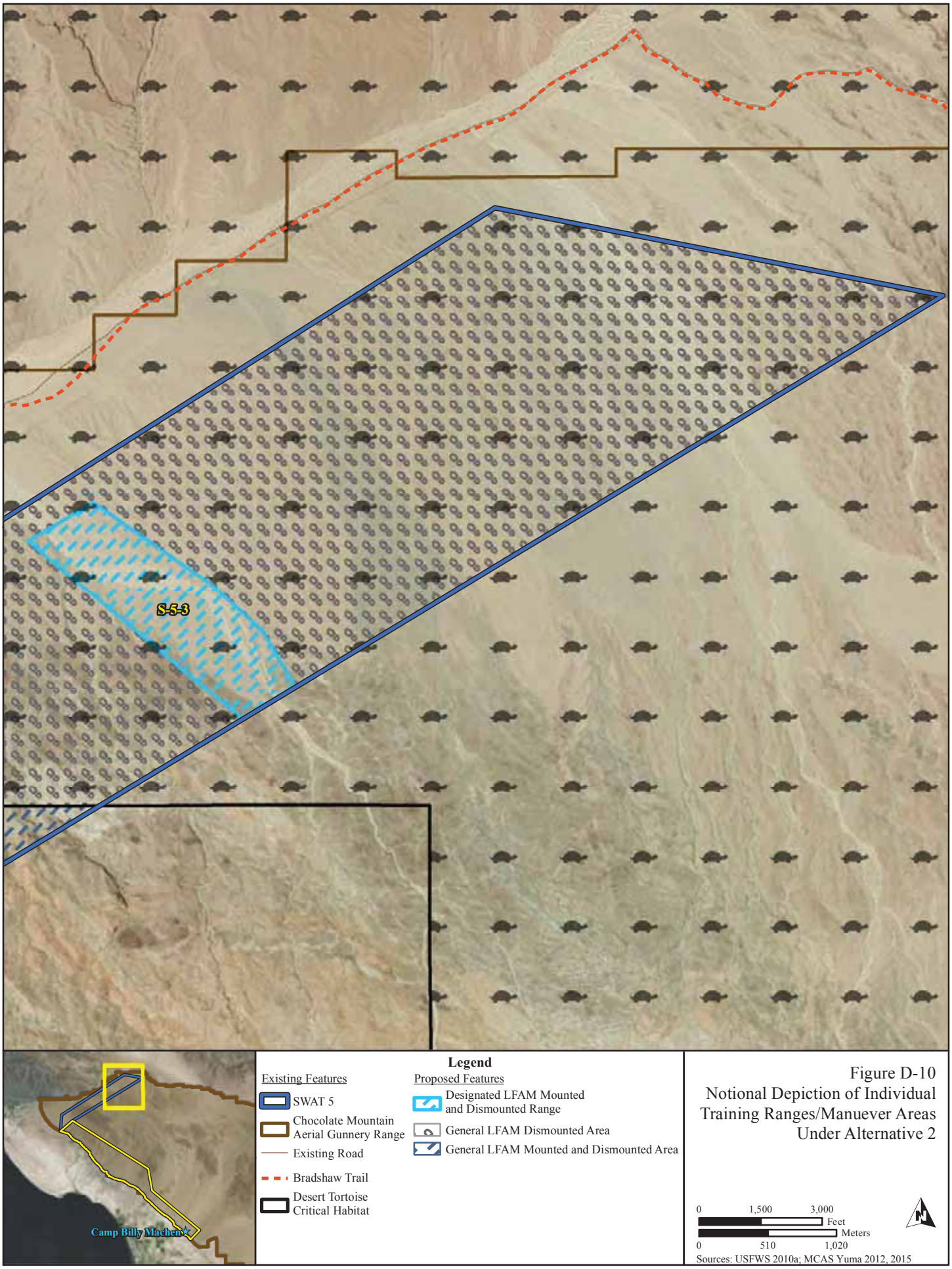


Figure D-10
Notional Depiction of Individual Training Ranges/Manuever Areas Under Alternative 2

APPENDIX E
BIOLOGICAL ASSESSMENT
(TO BE PROVIDED)

APPENDIX F
PROGRAMMATIC AGREEMENT
(TO BE PROVIDED)

APPENDIX G
AIR QUALITY CALCULATIONS

Alternative 1 and Alternative 2 - Total Construction Emissions

Total Annual Construction Emissions									
tons/year						metric tons/year			
ROG	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**CO2**	**CH4**	**N2O**	**CO2e**
2.09	11.89	18.23	0.01	58.71	40.57	1,976.88	0.12	0.00	1,980.00

SWAT 4 and SWAT 5 Construction

Salton Sea Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	34.85	User Defined Unit	34.85	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.4	**Precipitation Freq (Days)**	20
Climate Zone	15			**Operational Year**	2018
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 - Acreage of construction areas for SWAT 4 and 5

Construction Phase - Assume all grading could occur in a single year - construction is estimated over 3 years

Grading - Assuming borrow areas plus construction areas are disturbed areas.

On-road Fugitive Dust - All unpaved roads

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	75.00	261.00
tblGrading	AcresOfGrading	652.50	95.19
tblGrading	MaterialImported	0.00	342,300.00
tblLandUse	LotAcreage	0.00	34.85

tblOnRoadDust	HaulingPercentPave	50.00	0.00
tblOnRoadDust	VendorPercentPave	50.00	0.00
tblOnRoadDust	WorkerPercentPave	50.00	0.00
tblProjectCharacteristics	OperationalYear	2014	2018

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					
2015	1.2704	15.0814	11.3741	0.0202	511.6837	0.6058	512.2894	51.4297	0.5573	51.9869	0.0000	1,884.7043	1,884.7043	0.2375	0.0000	1,889.6913
Total	**1.2704**	**15.0814**	**11.3741**	**0.0202**	**511.6837**	**0.6058**	**512.2894**	**51.4297**	**0.5573**	**51.9869**	**0.0000**	**1,884.7043**	**1,884.7043**	**0.2375**	**0.0000**	**1,889.6913**

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					
2015	1.2704	15.0814	11.3740	0.0202	94.7321	0.6058	95.3378	9.8132	0.5573	10.3705	0.0000	1,884.7034	1,884.7034	0.2375	0.0000	1,889.6903
Total	**1.2704**	**15.0814**	**11.374**	**0.0202**	**94.7321**	**0.6058**	**95.3378**	**9.8132**	**0.5573**	**10.3705**	**0**	**1,884.70**	**1,884.70**	**0.2375**	**0**	**1,889.69**

	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	81.49	0.00	81.39	80.92	0.00	80.05	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	1/1/2015	12/31/2015	5	261	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 95.19

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	2	8.00	162	0.38
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Graders	1	8.00	174	0.41
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Grading	Scrapers	2	8.00	361	0.48

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
Grading	8	20.00	0.00	33,845.00	11.00	5.40	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Grading - 2015

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					0.8364	0.0000	0.8364	0.4374	0.0000	0.4374	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.8842	10.3156	6.6346	8.0600e-003		0.4962	0.4962		0.4565	0.4565	0.0000	767.8908	767.8908	0.2293	0.0000	772.7050
Total	**0.8842**	**10.3156**	**6.6346**	**8.0600e-003**	**0.8364**	**0.4962**	**1.3325**	**0.4374**	**0.4565**	**0.8939**	**0.0000**	**767.8908**	**767.8908**	**0.2293**	**0.0000**	**772.7050**

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	0.3739	4.7485	4.5732	0.0119	470.9048	0.1094	471.0142	47.0059	0.1006	47.1066	0.0000	1,097.6542	1,097.6542	6.9800e-003	0.0000	1,097.8008
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	0.0124	0.0173	0.1663	2.5000e-004	39.9426	1.5000e-004	39.9427	3.9863	1.4000e-004	3.9865	0.0000	19.1593	19.1593	1.2500e-003	0.0000	19.1855
Total	**0.3863**	**4.7658**	**4.7394**	**0.0122**	**510.8473**	**0.1096**	**510.9569**	**50.9922**	**0.1008**	**51.0930**	**0.0000**	**1,116.8135**	**1,116.8135**	**8.2300e-003**	**0.0000**	**1,116.9862**

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					0.8364	0.0000	0.8364	0.4374	0.0000	0.4374	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.8842	10.3156	6.6346	8.0600e-003		0.4962	0.4962		0.4565	0.4565	0.0000	767.8899	767.8899	0.2293	0.0000	772.7041
Total	**0.8842**	**10.3156**	**6.6346**	**8.0600e-003**	**0.8364**	**0.4962**	**1.3325**	**0.4374**	**0.4565**	**0.8939**	**0.0000**	**767.8899**	**767.8899**	**0.2293**	**0.0000**	**772.7041**

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	0.3739	4.7485	4.5732	0.0119	86.5566	0.1094	86.6660	8.6437	0.1006	8.7443	0.0000	1,097.6542	1,097.6542	6.9800e-003	0.0000	1,097.8008
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	0.0124	0.0173	0.1663	2.5000e-004	7.3391	1.5000e-004	7.3393	0.7321	1.4000e-004	0.7323	0.0000	19.1593	19.1593	1.2500e-003	0.0000	19.1855
Total	**0.3863**	**4.7658**	**4.7394**	**0.0122**	**93.8957**	**0.1096**	**94.0053**	**9.3758**	**0.1008**	**9.4765**	**0.0000**	**1,116.8135**	**1,116.8135**	**8.2300e-003**	**0.0000**	**1,116.9862**

SWAT EA - Concrete Batch Plant Emissions (Construction Phase)

Estimated Amount of Concrete per Phase	
Phase	**Cubic Yards**
1	900
2	300
3	1000
Total	2200
Estimated annual	1100

Annual Plant Wide Emissions Per Yard of Truck Mix Concrete

	Emission Factors - Controlled	**Emissions - Controlled**	**Emissions - Controlled**
	PM10 (lb/cy)	PM10 (lbs)	PM10 (tons)
Aggregate delivery to ground storage	0.0031	3.41	0.0017
Sand delivery to ground storage	0.0007	0.77	0.0004
Aggregate transfer to conveyor	0.0031	3.41	0.0017
Sand transfer to conveyor	0.0007	0.77	0.0004
Aggregate transfer to elevated storage	0.0031	3.41	0.0017
Sand transfer to elevated storage	0.0007	0.77	0.0004
Cement delivery to Silo	0.0001	0.11	0.0001
Cement supplement delivery to Silo	0.0002	0.22	0.0001
Weigh hopper loading	0.0038	4.18	0.0021
Truck mix loading	0.282	310.2	0.1551
	TOTAL	**327.25**	**0.16**

Source : USEPA AP 42, Fifth Edition, *Compilation of Air Pollutant Emission Factors, Chapter 11: Mineral Products Industry, Section 12: Concrete Batching*

Truck Emissions:

			Emission Factors (g/mi)										**Emissions, lbs/day**							**Emissions, tons/year**						
Equipment	**Vehicle Class**	**Fuel**	**CO**	**VOC**	**Nox**	**Sox**	**PM10**	**PM2.5**	**CO2**	**No. of Equipment**	**Miles per Day**	**Days in Service***	**CO**	**VOC**	**Nox**	**Sox**	**PM10**	**PM2.5**	**CO2**	**CO**	**VOC**	**Nox**	**Sox**	**PM10**	**PM2.5**	**CO2**
Concrete Truck	T6 instate construction heavy	diesel	0.44	0.11	7.61	0.01	0.23	0.14	1038.39	1	20	260	0.02	0.00	0.34	0.00	0.01	0.01	45.79	0.00	0.00	0.04	0.00	0.00	0.00	5.95
Dump Truck	T7 CAIRP construction	diesel	1.32	0.19	5.58	0.02	0.24	0.16	1594.30	1	20	260	0.06	0.01	0.25	0.00	0.01	0.01	70.30	0.01	0.00	0.03	0.00	0.00	0.00	9.14
																			TOTAL	**0.01**	**0.00**	**0.08**	**0.00**	**0.00**	**0.00**	**15.09**

Notes:

* Assumed that trucks would be in service for half of the construction period, on business days only.

Also assumed that trucks turn off engine when not in use.

Source: EMFAC2011

Fugitive Dust Emissions from Unpaved Road Travel:

Vehicle Type	**Miles per vehicle per day**	**Total Annual Miles per Vehicle**	**Vehicle Weight[1] (lbs)**	**Vehicle weight[1] (tons)**	**PM10 emissions per mile**	**Annual PM10 emissions**
Concrete Truck	20	5200	48000	24	2.80	7.29
Dump Truck	20	5200	68000	34	3.28	8.53
					TOTAL[3]	**10.28**

Notes:

[1]Average weight, assumed half of the trips are with the truck empty and the other half are with the truck full. Assumed concrete truck and dump truck each carry 10 cy of concrete or concrete materials when full.

[2]Formula for PM10 emissions:

E=1.5(silt content/12)^0.9 * (vehicle weight/3)^0.45

Assumes average silt content is 8.5%.

[3]Assumes that half of the truck travel is on major roads that receive a dust palliative, 70% efficiency

Total PM10 from concrete batching:

Emissions, tons/year							
CO	**VOC**	**Nox**	**Sox**	**PM10**	**PM2.5**	**CO2**	**CO2 (metric tons)**
0.01	0.00	0.08	0.00	10.45	0.00	15.09	13.7

Road Construction Emissions Model
Data Entry Worksheet

Version 7.1.5.1

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a
yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells C10 through C30.

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

Input Type

Project Name	Model RA	
Construction Start Year	2015	Enter a Year between 2009 and 2030 inclusive
Project Type	1	1 New/Road Construction 2 Road Widening 3 Bridge/Overpass Construction
Project Construction Time	24.00	months
Predominant Soil/Site Type: Enter 1, 2, or 3	1	1. Sand Gravel 2. Weathered Rock-Earth 3. Blasted Rock
Project Length	17.75	miles
Total Project Area	21.49	acres
Maximum Area Disturbed/Day	2.00	acres
Water Trucks Used?	1	1 Yes 2 No
Soil Imported	0.00	yd³/day
Soil Exported	0.00	yd³/day
Average Truck Capacity	20	yd³ (assume 20.0 unless not)

	Months	% Time
	2.4	10
	9.6	40
	8.4	35
	3.6	15

The remaining sections of this sheet contain areas that can be modified by the user, although those modifications are optional.

Note: The program's estimates of construction period phase length can be overridden in cells C34 through C37.

Construction Periods	User Overrides of Construction Months	Program Calculated Months
Grading/Land Clearing		2.40
Grading/Excavation		9.60
Drainage/Utilities/Sub-Grade		8.40
Paving		3.60
Totals	0.00	24.00

	2009	%	2010	%	2011	%	2012	%	2013	%	2014	%	2015	%	2016	%	2017	%	2018	%	2019	%	2020	%	2021	%	2022	%	2023	%	2024	%	2025	%
Grading/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.40	1.00	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	0.00	0.00	0.00
Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.60	1.00	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	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.40	1.00	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	0.00	0.00	0.00
Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.60	1.00	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	0.00	0.00	0.00

	2025 adjusted %	sum	1	2	3	4	5	6	7	8
Grading/Land Clearing	0.00	1.00	9.6	2.4						
Grading/Excavation	0.00	1.00	9.6	9.6						
Drainage/Utilities/Sub-Grade	0.00	1.00	8.4	8.4						
Paving	0.00	1.00	3.6	3.6						
Totals			31.2	24						

NOTE: soil hauling emissions are included in the Grading/Excavation Construction Period Phase, therefore the Construction Period for Grading/Excavation cannot be zero if hauling is part of the project.

Hauling emission default values can be overridden in cells C48 through C50.

Soil Hauling Emissions

User Input	User Overrides of Soil Hauling Defaults	Default Values
Workround trip		20
Round trips/day		0
Vehicle miles travelled/day (calculated)		0

Hauling Emissions	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate (grams/mile)	0.26	9.41	1.09	0.22	0.15	1694.67
Emission rate (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day	0.00	0.00	0.00	0.00	0.00	0.00
Tons per construction period	0.00	0.00	0.00	0.00	0.00	0.00

20
0
0

Worker commute default values can be overridden in cells C53 through C58.

Worker Commute Emissions

	User Overrides of Worker Commute Default Values	Default Values
Miles/one way trip		20
Trips/vehicle/day		2
No. of equipment - Grading/Land Clearing		23.0
No. of equipment - Grading/Excavation		30
No. of equipment - Drainage/Utilities/Sub-Grade		23.0
No. of equipment - Paving		28.75

Worker Emissions	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate - Grading/Land Clearing (grams/mile)	0.164	0.219	1.860	0.047	0.020	423.918
Emission rate - Grading/Excavation (grams/mile)	0.164	0.219	1.860	0.047	0.020	423.918
Emission rate - Drainage/Utilities/Sub-Grade (g/mile)	0.147	0.196	1.754	0.047	0.020	423.860
Emission rate - Paving (grams/mile)	0.147	0.196	1.754	0.047	0.020	423.860
Emission rate - Grading/Land Clearing (grams/trip)	0.068	0.365	4.890	0.054	0.003	99.828
Emission rate - Grading/Excavation (grams/trip)	0.068	0.365	4.890	0.054	0.003	99.828
Emission rate - Drainage/Utilities/Sub-Grade (g/trip)	0.069	0.323	4.260	0.054	0.003	99.862
Emission rate - Paving (grams/trip)	0.069	0.323	4.260	0.054	0.003	99.862
Pounds per day - Grading/Land Clearing	0.380	0.471	4.340	0.094	0.040	888.889
Tons per const. Period - Grad/Land Clear	0.010	0.012	0.115	0.002	0.001	23.481
Pounds per day - Grading/Excavation	0.590	0.732	6.742	0.146	0.062	1382.405
Tons per const. Period - Grading/Excavation	0.092	0.077	0.713	0.015	0.007	145.962
Pounds per day - Drainage/Utilities/Sub-Grade	0.496	0.602	5.095	0.135	0.057	1264.093
Tons per const. Period - Drainc/Util/Sub-Grade	0.048	0.056	0.477	0.012	0.005	118.646
Pounds per day - Paving	0.436	0.533	4.549	0.119	0.093	1120.890
Tons per const. Period - Paving	0.017	0.021	0.180	0.005	0.002	44.861
Tons per construction period	0.168	0.166	1.565	0.034	0.013	333.071

Water truck default values can be overridden in cells C61 through C63 and E61 through E63.

Water Truck Emissions

	User Overrides of Default # Water Trucks	Program Estimate of Number of Water Trucks	User Overrides of Truck Miles Travelled/Day	Default Values Miles Travelled/Day
Grading/Land Clearing - Exhaust		1		40
Grading/Excavation - Exhaust		1		40
Drainage/Utilities/Subgrade		1		40

40
40
40

Emissions	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate - Grading/Land Clearing (grams/mile)	0.26	9.41	1.09	0.22	0.15	1694.67
Emission rate - Grading/Excavation (grams/mile)	0.26	9.41	1.09	0.22	0.15	1694.67
Emission rate - Drainage/Utilities/Sub-Grade (g/mile)	0.16	8.26	0.70	0.17	0.13	1679.86
Pounds per day - Grading/Land Clearing	0.52	0.83	0.10	0.02	0.01	149.31
Tons per const. Period - Grad/Land Clear	0.00	0.02	0.00	0.00	0.00	3.86
Pound per day - Grading/Excavation	0.52	0.83	0.10	0.02	0.01	149.31
Tons per const. Period - Grading/Excavation	0.00	0.08	0.01	0.00	0.00	15.77
Pound per day - Drainage/Utilities/Subgrade	0.31	0.73	0.06	0.01	0.01	148.00
Tons per const. Period - Drainage/Utilities/Subgrade	0.00	0.07	0.01	0.00	0.00	13.68

Fugitive dust default values can be overridden in cells C119 through C123.

Fugitive Dust

	User Overrides of Miles Scraped/Day/Equip	Default Maximum Scraped/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grading/Land Clearing		2	20.0	0.6	4.2	0.1
Fugitive Dust - Grading/Excavation		2	20.0	2.1	4.2	0.4
Fugitive Dust - Drainage/Utilities/Subgrade		2	20.0	1.8	4.2	0.4

1
1
1
20.0 CEIDARS - Off Road Equipment Fugitive Dust PM2.5 % of PM10

Off-Road Equipment Emissions

Grading/Land Clearing

Overrides of Default Number of Vehicles	Default Number of Vehicles Program estimate	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
	1	Crawler Tractors	0.74	4.47	9.67	0.37	0.34	825.30
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	1	Excavators	0.44	2.79	4.90	0.24	0.22	572.80
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
	2	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	16	Signal Boards	6.49	22.48	21.92	1.70	1.56	2518.94
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Land Clearing	pounds per day	7.7	29.7	36.6	2.3	2.1	3917.7
	Grading/Land Clearing	tons per phase	0.2	0.8	1.0	0.1	0.1	105.8

1 New Roa 2 Road Wi 3 Bridge/Overpass Construction
0 0 0
0 0 0
0 0 0
0 0 0
0 0 0
0 0 0
1 1 1
0 0 0
0 0 0
0 0 0
0 0 0
0 0 0
0 0 0

		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Scrapers/Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
	2	Tractors/Loaders/Backhoes	0.76	3.15	6.89	0.54	0.50	672.79	2	4	2
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Welders	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
	Grading/Excavation	pounds per day	14.6	62.6	110.0	6.2	6.7	10847.1			
	Grading	tons per phase	1.6	6.8	12.1	0.7	0.8	1192.6			

Drainage/Utilities/Subgrade Operate at Default Number of Vehicles	Default Number of Vehicles Present-estimate	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day	1 New Rsz	2 Road Wi	3 Bridge/Overpass Construction
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
	1	Air Compressors	0.68	3.42	4.38	0.37	0.34	527.95	1	1	1
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
	1	Generator Sets	0.51	2.98	3.86	0.27	0.25	487.07	1	1	1
	1	Graders	1.07	3.48	10.38	0.58	0.54	671.02	1	2	2
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
	1	Plate Compactors	0.04	0.21	0.25	0.01	0.01	34.45	1	1	1
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
	1	Pumps	0.44	2.47	3.19	0.23	0.22	396.14	1	1	1
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
	1	Rough Terrain Forklifts	0.22	2.03	2.73	0.15	0.14	372.74	1	1	1
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
	4	Scrapers	2.91	14.51	35.39	1.43	1.31	3216.04	2	1	4
	16	Signal Boards	5.81	21.83	21.11	1.53	1.40	2538.94	0	0	0
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Scrapers/Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
	2	Tractors/Loaders/Backhoes	0.72	3.15	6.54	0.50	0.46	671.85	2	4	2
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Welders	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
	Drainage	pounds per day	12.4	56.1	87.6	5.1	4.7	8674.2			
	Drainage	tons per phase	1.1	5.2	8.1	0.5	0.5	823.0			

Paving Operate at Default Number of Vehicles	Default Number of Vehicles Present-estimate	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day	1 New Rsz	2 Road Wi	3 Bridge/Overpass Construction
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Graders	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
0.00	1	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	1	1	1
0.00	1	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	1	1	1
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
0.00	1	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	1	1	1
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
0.00	16	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Scrapers/Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
0.00	2	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	2	3	2
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
		Welders	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
	Paving	pounds per day	0.0	0.0	0.0	0.0	0.0	0.0			
	Paving	tons per phase	0.0	0.0	0.0	0.0	0.0	0.0			
Total Emissions all Phases (tons per construction period) =>			**2.9**	**12.6**	**21.2**	**1.2**	**1.1**	**2009.5**			
TOTAL ANNUAL CONSTRUCTION EMISSIONS			**1.45**	**6.20**	**10.61**	**0.59**	**0.54**	**1038.53**			

Equipment default values for horsepower and hours/day can be overridden in cells C289 through C322 and E289 through E322.

Equipment		Default Values Horsepower		Default Values Hours/Day
Aerial Lifts		63		4
Air Compressors		78		4
Bore/Drill Rigs		206		4
Cement and Mortar Mixers		9		4
Concrete/Industrial Saws		81		4
Cranes		226		4
Crawler Tractors		208		4
Crushing/Proc. Equipment		142		4
Excavators		158		4
Forklifts		89		4
Generator Sets		84		4
Graders		174		4
Off-Highway Tractors		124		4
Off-Highway Trucks		402		4
Other Construction Equipment		172		4
Other General Industrial Equipment		88		4
Other Material Handling Equipment		167		4
Pavers		130		6
Paving Equipment		132		6
Plate Compactors		8		6
Pressure Washers		13		6
Pumps		63		6
Rollers		80		6
Rough Terrain Forklifts		100		6
Rubber Tired Dozers		255		6
Rubber Tired Loaders		200		6
Scrapers		356		6
Signal Boards		25		6
Skid Steer Loaders		65		6
Surfacing Equipment		253		6
Scrapers/Excavators		158		6
Tractors/Loaders/Backhoes		97		6
Trenchers		81		6
Welders		46		6

Horsepower	Load Fact	Hours/Day	Columns (L-M-N-O)
63	1	8.0	504.0
100	1	8.0	845.4
206	1	8.0	1840.7
9	1	8.0	62.6
84	1	8.0	511.2
226	1	8.0	1809.6
208	1	8.0	1666.0
142	1	8.0	1136.7
158	1	8.0	1261.5
89	1	8.0	715.5
84	1	8.0	505.8
174	1	8.0	1397.9
124	1	8.0	991.1
402	1	8.0	3221.4
172	1	8.0	1373.1
88	1	8.0	703.5
167	1	8.0	1336.1
130	1	8.0	1005.8
132	1	8.0	1044.5
8	1	8.0	64.0
13	1	8.0	208.0
63	1	8.0	427.7
80	1	8.0	644.2
100	1	8.0	803.5
255	1	8.0	2043.5
200	1	8.0	1597.8
356	1	8.0	2850.0
25	1	8.0	161.2
65	1	8.0	520.0
254	1	8.0	2026.1
158	1	8.0	1124.9
98	1	8.0	783.3
81	1	8.0	649.2
45	1	8.0	363.5

Table 1 Operations Summary No-Action Alternative

NAA Operations and Description															
	General Range Training Activity	Reference	Duration, hours	Operations (b)	No. of Personnel	Ground Vehicles	Number of Vehicles	Miles per vehicle	Vehicles per year	Aircraft	Number of aircraft	Hours of operation per year	Aircraft per year	Ordnance	Number of ordnance assumed
1	5.56 mm static SQT		4.0	99	13 to 26	ERV	2	0.25	49.5	None	0	0	0	5.56 mm rounds	2803306
	5.56 mm static ULT			99		Pickup	1	0.25	24.75	None	0	0	0		
2	7.62 mm static SQT		4.0	90	13 to 26	ERV	2	0.25	45	None	0	0	0	7.62 mm rounds	2788370
	7.62 mm static ULT			90		Pickup	1	0.25	22.5	None	0	0	0		
3	0.5 caliber static SQT		4.5	21	18 to 19	ERV	2	0.25	10.5	None	0	0	0	0.5 caliber	94944
	0.5 caliber static NSW			21		Pickup	1	0.25	5.25	None	0	0	0		
4	HELO sniping		4.5	6	8 to 12	None	0	0	0	HH60H	1	72	72		
5	Explosive projectiles SQT		4.5	19	16 to 18	MTVR	2	1.7	64.6	None	0	0	0	40 mm and TP grenades	23992
				19		Pickup	3	1.7	96.9					84 mm M3 Karl Gustav	1162
				19		ERV	2	1.7	64.6						
	Explosive projectiles ULT			19		Pickup	10	1.7	323						
6	Mortar ULT		3.5	9	12	Pickup	10	2.3	207	None	0	0	0	60 mm Mortar	2187
7	In-place demolitions SQT		4.0	27	6 to 23	MTVR	2	2.3	124.2	None	0	0	0	Anti-Personnel Mines	360
	In-place demolitions SQT			27		Pickup	3	2.3	186.3					Demolition Blocks/shaped charges (2.5 lbs)	1080
	In-place demolitions SQT			27		ERV	2	2.3	124.2					Demolition Blocks/shaped charges (50 lbs)	72
	In-place demolitions ULT			27		Pickup	10	2.3	621					Detonating cord	54000
8	Dry-fire and maneuver SQT		5.0	87	11 to 22	MTVR	2	12	2088	None	0	0	0	Smokes, flares, etc.	38820
	Dry-fire and maneuver SQT			87		Pickup	3	12	3132						
	Dry-fire and maneuver SQT			87		ERV	2	12	2088						
	Dry-fire and maneuver SQT			87		ATV	2	12	2088						
	Dry-fire and maneuver ULT			87		Pickup	10	12	10440						
9	LFAM SQT		4.5	318	5 to 22	MTVR	2	12	7632	None	0	0	0	9 mm	10000
	LFAM SQT			318		Pickup	3	12	11448					Hand Grenades	784
	LFAM SQT			318		ERV	2	12	7632						
	LFAM SQT			318		ATV	2	12	7632						
	LFAM ULT			318		Pickup	10	12	38160						
10	Blank-fire and maneuver SQT		14.0	42	15 to 35	MTVR	2	29	2436	None	0	0	0	LAAW	568
	Blank-fire and maneuver SQT			42		Pickup	3	29	3654						
	Blank-fire and maneuver SQT			42		ERV	2	29	2436						
	Blank-fire and maneuver SQT			42		ATV	2	29	2436						
	Blank-fire and maneuver ULT			42		HMMWV	5	29	6090						
	Blank-fire and maneuver ULT			42		Pickup	5	29	6090						
	Totals			2770											

(a) Days = the number of days per operation
(b) Operations = the number of operations per year

Table 2 Operations Summary - Aircraft Emissions No-Action Alternative

NAA Operations and Description

Scenario	Type Training	Reference	Days (a)	Operations (b)	Aircraft	Number	Aircraft Time on Range (hrs)	Emissions Factors (lb/operation) (c)								Emissions (lbs)							
							Hours	CO	NOx	ROG	SOx	PM10	CO2	CH4	N2O	CO	Nox	ROG	Sox	PM	CO2	CH4	N2O
1	5.56 mm static SQT		4	99	None	0																	
2	7.62 mm static SQT		4	90	None	0																	
3	0.5 caliber static SQT		4.5	21	None	0																	
4	HELO sniping		4.5	6	HH60H	72	336.0	7.50	7.68	0.66	0.48	5.04	3859.20	0.11	0.12	2520	2580.48	221.76	161.28	1693.44	1296691	35.8848	40.32
5	Explosive projectiles SQT		4.5	19	None	0																	
6	Mortar ULT		3.5	9	None	0																	
7	In-place demolitions SQT		4	27	None	0																	
8	Dry-fire and maneuver SQT		5	87	None	0																	
9	LFAM SQT		4.5	318	None	0																	
10	Blank-fire and maneuver SQT		14	42	None	0																	
											pounds/year					**2520**	**2580.48**	**221.76**	**161.28**	**1693.44**	**1296691.2**	**35.8848**	**40.32**
											tons/year					**1.26**	**1.29024**	**0.11088**	**0.08064**	**0.84672**	**648.3456**	**0.0179424**	**0.02016**

SH60 from AESO Memorandum Report No. 9929, February 1999

(a) Days = the number of days per operation
(b) Operations = the number of operations per year
(c) Assume 1 Pad Landings per aircraft per hour for rotary wing aircraft; assume cruise for fixed wing aircraft.

Table 3 Operations Summary - Ground Vehicles Emissions No-Action Alternative

NAA Operations and Description

Scenario	Type Training	Days (a)	Operations (b)	Ground Vehicles	Number	Total Miles	Hours	horsepower	Emissions Factors (grams/VMT or g/hp-hr) CO	NOx	ROG	SOx	PM10	PM2.5	CO2	CH4	N2O	Emissions (lbs) CO	Nox	ROG	Sox	PM10	PM2.5	CO2	CH4	N2O
1	5.56 mm static SQT	4	99	ERV	2	49.5	3.3	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	2.1718233	5.353575	0.371978	0.009466	0.207797	0.207797	964.3963	0.066004	0.136375
	5.56 mm static ULT	4	99	Pickup	1	24.75	1.65	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	0.0240722	0.027681	0.004123	0.000327	0.003403	0.00313	18.86863	0.000192	0.001152
2	7.62 mm static SQT	4	90	ERV	2	45	3	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	1.9743848	4.866886	0.338161	0.008605	0.188907	0.188907	876.7239	0.060004	0.123977
	7.62 mm static ULT	4	90	Pickup	1	22.5	1.5	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	0.0875352	0.100657	0.014993	0.001191	0.012373	0.011383	68.61318	0.000696	0.004187
3	0.5 caliber static SQT	4.5	21	ERV	2	10.5	0.7	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	2.073104	5.11023	0.35507	0.009036	0.198352	0.198352	920.5601	0.063004	0.130176
	0.5 caliber static NSW	4.5	21	Pickup	1	5.25	0.35	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	0.0051062	0.005872	0.000875	6.94E-05	0.000722	0.000664	4.002436	4.06E-05	0.000244
4	HELO sniping	4.5	6	None	0	0																				
5	Explosive projectiles SQT	4.5	19	MTVR	2	64.6	4.307	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	0.2797045	3.10264	0.215578	0.005486	0.120428	0.120428	558.9115	0.038252	0.079036
		4.5	19	Pickup	3	96.9	6.46	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	0.0942462	0.487683	0.072643	0.005768	0.059948	0.055152	332.4309	0.003374	0.020288
		4.5	19	ERV	2	64.6	4.307	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	0.2797045	3.10264	0.215578	0.005486	0.120428	0.120428	558.9115	0.038252	0.079036
	Explosive projectiles ULT	4.5	19	Pickup	10	323	21.53	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	0.314154	1.62561	0.242142	0.019227	0.199826	0.18384	1108.103	0.011247	0.067625
6	Mortar ULT	3.5	9	Pickup	10	207	13.8	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	0.7046581	0.810289	0.120696	0.009584	0.099604	0.091635	552.3361	0.005606	0.033708
7	In-place demolitions SQT	4	27	MTVR	2	124.2	8.28	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	5.4493021	13.43261	0.933326	0.023751	0.521382	0.521382	2419.758	0.16561	0.342177
	In-place demolitions SQT	4	27	Pickup	3	186.3	12.42	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	0.1811978	0.20836	0.031036	0.002464	0.025612	0.023563	142.0293	0.001442	0.008668
	In-place demolitions SQT	4	27	ERV	2	124.2	8.28	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	5.4493021	13.43261	0.933326	0.023751	0.521382	0.521382	2419.758	0.16561	0.342177
	In-place demolitions ULT	4	27	Pickup	10	621	41.4	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	0.6039926	0.694533	0.103454	0.008214	0.085374	0.078544	473.431	0.004805	0.028893
8	Dry-fire and maneuver SQT	5	87	MTVR	2	2088	139.2	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	91.611455	225.8235	15.69069	0.399287	8.765269	8.765269	40679.99	2.784166	5.752545
	Dry-fire and maneuver SQT	5	87	Pickup	3	3132	208.8	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	3.0462238	3.502863	0.521768	0.041429	0.430584	0.396137	2387.739	0.024235	0.145719
	Dry-fire and maneuver SQT	5	87	ERV	2	2088	139.2	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	91.611455	225.8235	15.69069	0.399287	8.765269	8.765269	40679.99	2.784166	5.752545
	Dry-fire and maneuver SQT	5	87	ATV	2	2088	139.2	300	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	68.708591	169.3676	11.76802	0.299466	6.573952	6.573952	30509.99	2.088124	4.314409
	Dry-fire and maneuver ULT	5	87	Pickup	10	10440	696	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	10.154079	11.67621	1.739225	0.138098	1.43528	1.320458	7959.129	0.080784	0.48573
9	LFAM SQT	4.5	318	MTVR	2	7632	508.8	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	334.85566	825.4239	57.35219	1.459464	32.03857	32.03857	148692.4	10.17661	21.02655
	LFAM SQT	4.5	318	Pickup	3	11448	763.2	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	11.134473	12.80357	1.907151	0.151432	1.573859	1.44795	8727.597	0.088583	0.532628
	LFAM SQT	4.5	318	ERV	2	7632	508.8	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	334.85566	825.4239	57.35219	1.459464	32.03857	32.03857	148692.4	10.17661	21.02655
	LFAM SQT	4.5	318	ATV	2	7632	508.8	300	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	251.14175	619.0679	43.01414	1.094598	24.02893	24.02893	111519.3	7.632455	15.76991
	LFAM ULT	4.5	318	Pickup	10	38160	2544	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	37.114911	42.67856	6.357168	0.504773	5.246197	4.826502	29091.99	0.295278	1.775428
10	Blank-fire and maneuver SQT	14	42	MTVR	2	2436	162.4	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	106.88003	263.4608	18.30581	0.465835	10.22615	10.22615	47459.99	3.248194	6.711303
	Blank-fire and maneuver SQT	14	42	Pickup	3	3654	243.6	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	3.5539278	4.086674	0.608729	0.048334	0.502348	0.46216	2785.695	0.028274	0.170006
	Blank-fire and maneuver SQT	14	42	ERV	2	2436	162.4	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	106.88003	263.4608	18.30581	0.465835	10.22615	10.22615	47459.99	3.248194	6.711303
	Blank-fire and maneuver SQT	14	42	ATV	2	2436	162.4	300	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	80.160023	197.5956	13.72936	0.349376	7.669611	7.669611	35594.99	2.436145	5.033477
	Blank-fire and maneuver ULT	14	42	HMMWV	5	6090	406	192	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	28.810508	33.1293	4.934762	0.391831	4.072369	3.746579	22582.7	0.22921	1.378179
	Blank-fire and maneuver ULT	14	42	Pickup	5	6090	406	360	2.125539	5.78414	0.426389	0.010591	0.255548	0.255548	941.2576	0.067618	0.123322	28.537963	77.65915	5.724793	0.142194	3.431049	3.431049	12637.53	0.907857	1.655749
	Totals		###															1608.749	3853.346	276.9555	7.943131	159.3897	158.2899	748880.2	46.85302	99.63974
																	Total, tons/year	**0.8043745**	**1.926673**	**0.138478**	**0.003972**	**0.079695**	**0.079145**	**374.4401**	**0.023427**	**0.04982**

NOTES: ERV modeled as off road truck
MTVR and EVR modeled as 400 hp off road truck

Pickup modeled as MDV, diesel
ATV modeled as 300 horsepower off road truck
HMMWV modeled as 192 horsepower off road truck

Table 3 Operations Summary - Ground Vehicles Emissions No-Action Alternative

Scenario	Type Training	Days (a)	Operations (b)	Ground Vehicles	Number	Total Miles	Hours	horsepower	Emissions Factors (grams/VMT or g/hp-hr)									Emissions (lbs)								
									CO	NOx	ROG	SOx	PM10	PM2.5	CO2	CH4	N2O	CO	Nox	ROG	Sox	PM10	PM2.5	CO2	CH4	N2O

Emission factors from ARB OFFROAD model

Table 4 Ordnance Emissions No-Action Alternative

	NAA Operations and Description						CO	NOX	ROG	SOX	PM10	PM2.5	Lead	CO2	CH4	Emissions, lbs/year								
Scenario	Type Training	Reference	Days (a)	Operations (b)	Ordnance	Number	lbs/item	lbs/item	lbs/item	lbs/item	lbs/item	lbs/item	lbs/item	lbs/item	lbs/item	Total CO	Total NOx	Total ROG	Total SOx	Total PM10	Total PM2.5	Total Lead	Total CO2	Total CH4
1	5.56 mm static SQT		4	99	5.56 mm rounds	2803306	1.60E-03	8.50E-05			3.90E-05	2.80E-05	5.10E-06	8.70E-04	9.70E-06	2.24E+00	1.19E-01	0.00E+00	0.00E+00	5.47E-02	3.92E-02	7.15E-03	1.22E+00	1.36E-02
	5.56 mm static ULT			99																				
2	7.62 mm static SQT		4	90	7.62 mm rounds	2788370	2.30E-03	9.70E-05			5.10E-05	3.80E-05	4.90E-06	1.20E-03	1.00E-05	3.21E+00	1.35E-01	0.00E+00	0.00E+00	7.11E-02	5.30E-02	6.83E-03	1.67E+00	1.39E-02
	7.62 mm static ULT			90																				
3	0.5 caliber static SQT		4.5	21	0.5 caliber	94944	1.10E-02	1.20E-03			3.10E-04	1.90E-04	1.30E-05	5.10E-03	1.30E-04	5.22E-01	5.70E-02	0.00E+00	0.00E+00	1.47E-02	9.02E-03	6.17E-04	2.42E-01	6.17E-03
	0.5 caliber static NSW			21																				
4	HELO sniping		4.5	6																				
5	Explosive projectiles SQT		4.5	19	40 mm and TP grenades	23992	2.60E-03	9.70E-05			1.40E-04	1.20E-04	1.10E-03	2.70E-03	5.40E-06	3.12E-02	1.16E-03	0.00E+00	0.00E+00	1.68E-03	1.44E-03	1.32E-02	3.24E-02	6.48E-05
					84 mm M3 Karl Gustav	1162	1.90E-01	4.80E-03			1.20E-02	1.00E-02	1.70E-05	1.90E-01	5.60E-04	1.10E-01	2.79E-03	0.00E+00	0.00E+00	6.97E-03	5.81E-03	9.88E-06	1.10E-01	3.25E-04
	Explosive projectiles ULT			19																				
6	Mortar ULT		3.5	9	60 mm Mortar	2187	5.70E-05	5.70E-04			1.70E-02	1.50E-02	3.20E-05	3.20E-03		6.23E-05	6.23E-04	0.00E+00	0.00E+00	1.86E-02	1.64E-02	3.50E-05	3.50E-03	0.00E+00
7	In-place demolitions SQT		4	27	Anti-Personnel Mines	360	2.00E-02	1.80E-02		9.10E-05	4.90E-02	2.60E-02	5.70E-05	1.60E+00	3.80E-04	3.60E-03	3.24E-03	0.00E+00	1.64E-05	8.82E-03	4.68E-03	1.03E-05	2.88E-01	6.84E-05
	In-place demolitions SQT			27	Demolition Blocks/shaped charges (2.5 lbs)	1080	1.20E-02	3.25E-02		1.00E-04	6.25E-02	3.50E-02	5.00E-04	3.00E+00		6.48E-03	1.76E-02	0.00E+00	5.40E-05	3.38E-02	1.89E-02	2.70E-04	1.62E+00	0.00E+00
	In-place demolitions SQT			27	Demolition Blocks/shaped charges (50 lbs)	72	3.15E-01	3.45E-01			1.75E+00	7.00E-01	1.85E-01	6.50E+01		1.13E-02	1.24E-02	0.00E+00	0.00E+00	6.30E-02	2.52E-02	6.66E-03	2.34E+00	0.00E+00
	In-place demolitions ULT			27	Detonating cord	54000	1.10E-03	2.60E-04			2.80E-03	2.00E-03	1.50E-05	5.70E-03	1.80E-05	2.97E-02	7.02E-03	0.00E+00	0.00E+00	7.56E-02	5.40E-02	4.05E-04	1.54E-01	4.86E-04
8	Dry-fire and maneuver SQT		5	87	Smokes, flares, etc.	38820	7.50E-03	2.50E-03	2.40E-04	7.10E-05	5.00E-02	5.00E-02	3.80E-06	1.80E-01		1.46E-01	4.85E-02	4.66E-03	1.38E-03	9.71E-01	9.71E-01	7.38E-05	3.49E+00	0.00E+00
	Dry-fire and maneuver SQT			87																				
	Dry-fire and maneuver SQT			87																				
	Dry-fire and maneuver SQT			87																				
	Dry-fire and maneuver ULT			87																				
9	LFAM SQT		4.5	318	9 mm	10000	3.10E-04	1.50E-05		8.20E-07	2.40E-05	2.00E-05	6.80E-06	2.00E-04	1.40E-06	1.55E-03	7.50E-05	0.00E+00	4.10E-06	1.20E-04	1.00E-04	3.40E-05	1.00E-03	7.00E-06
	LFAM SQT			318	Hand Grenades	784	1.10E-05	4.00E-05	3.20E-07		1.10E-04	9.40E-05		1.70E-04		4.31E-06	1.57E-05	1.25E-07	0.00E+00	4.31E-05	3.68E-05	0.00E+00	6.66E-05	0.00E+00
	LFAM SQT			318																				
	LFAM SQT			318																				
	LFAM ULT			318																				
10	Blank-fire and maneuver SQT		14	42	LAAW	568	4.30E-05	2.50E-03	7.30E-06	7.60E-05	1.40E-02	1.30E-02		1.10E-02		1.22E-05	7.10E-04	2.07E-06	2.16E-05	3.98E-03	3.69E-03	0.00E+00	3.12E-03	0.00E+00
	Blank-fire and maneuver SQT			42																				
	Blank-fire and maneuver SQT			42																				
	Blank-fire and maneuver SQT			42																				
	Blank-fire and maneuver ULT			42																				
	Blank-fire and maneuver ULT			42																				
	Totals			2770												6.31E+00	4.05E-01	4.66E-03	1.47E-03	1.32E+00	1.20E+00	3.53E-02	1.12E+01	3.47E-02
															Total tons/year	3.16E-03	2.03E-04	2.33E-06	7.37E-07	6.62E-04	6.01E-04	1.76E-05	5.59E-03	1.73E-05

NOTES Emission factors from AP-42, Chapter 15.
5.56-mm rounds from M-855 5.56 mm ball cartridge
7.62-mm rounds from M-80 7.62 mm ball cartridge
0.5 caliber from A557 M33 ball and M17 tracer cartridge
40 mm and TP grenades assumed to be M918 40 mm practice cartridges
Hand Grenades from M228 Practice Hand Grenade
84 mm M3 assumed to be M301A3
9 mm assumed to be M882 ball cartridge
60 mm assumed to be 60 mm full range practice cartridge
Anti-personnel mines assumed to be M18A1 antipersonnel mine
LAAW assumed to be M22 Anti-tank guided missile and rocket simulator
Demolition blocks/shaped charges 2.5 lbs NEW max assumed to be 1 lb blocks
Demolition blocks/shaped charges 50 lbs NEW max assumed to be 15 lb blocks
Detonating cord assumed to be M732 Proximity Fuse
Smoke, flare, etc assumed to be M159 White Star Cluster Signal Flare

Vehicle mileage data provided by NSW and USMC.

Total Vehicle Miles: Existing Activity

Table 1. Annual Miles Driven by NSW Vehicles in Support of EXISTING NSW Training Activities									
Training Activity Type	# Training Events per Year Using Vehicles	Vehicle Type	# of Vehicles (by type)	per vehicle (per training	Total Annual Miles per Vehicle Type (per training activity)	Vehicle Weight (lbs)[1]	Vehicle weight (tons)	PM10 emissions per mile (lb/VMT)[2]	Annual PM10 emissions (tons/year)
SQT 5.56mm Static	36	ERV	2	0.25	50	6,000	3.0	1.10	0.02
ULT 5.56mm Static	63	Pickup	1	0.25	25	5,250	2.6	1.04	0.01
SQT 7.62mm Static	18	ERV	2	0.25	45	6,000	3.0	1.10	0.02
ULT 7.62mm Static	72	Pickup	1	0.25	23	5,250	2.6	1.04	0.01
SQT .50 cal Static	6	ERV	2	0.25	11	6,000	3.0	1.10	0.00
NSWC N4 .50 cal Weapons	15	Pickup	1	0.25	5	5,250	2.6	1.04	0.00
SQT Explosive Projectiles	6	MTVR	2	1.7	65	27,900	14.0	2.20	0.06
	6	Pickup	3	1.7	97	5,250	2.6	1.04	0.04
	6	ERV	2	1.7	65	6,000	3.0	1.10	0.03
ULT Explosive Projectiles	97	Pickup	10	1.7	323	5,250	2.6	1.04	0.14
ULT Mortar	9	Pickup	10	2.3	207	5,250	2.6	1.04	0.09
SQT In-place Demolitions	18	MTVR	2	2.3	124	27,900	14.0	2.20	0.11
	18	Pickup	3	2.3	186	5,250	2.6	1.04	0.08
	18	ERV	2	2.3	124	6,000	3.0	1.10	0.06
ULT In-Place Demolitions	9	Pickup	10	2.3	621	5,250	2.6	1.04	0.27
SQT Dry-Fire & Maneuver	24	MTVR	2	12	2,088	27,900	14.0	2.20	1.89
	24	Pickup	3	12	3,132	5,250	2.6	1.04	1.34
	24	ERV	2	12	2,088	6,000	3.0	1.10	0.95
	24	ATV	2	12	2,088	650	0.3	0.40	0.35
ULT Dry-Fire & Maneuver	63	Pickup	10	12	10,440	5,250	2.6	1.04	4.46
SQT Live-Fire & Maneuver	120	MTVR	2	12	7,632	27,900	14.0	2.20	6.91
	120	Pickup	3	12	11,448	5,250	2.6	1.04	4.89
	120	ERV	2	12	7,632	6,000	3.0	1.10	3.46
	120	ATV	2	12	7,632	650	0.3	0.40	1.27
ULT Live-Fire & Maneuver	192	Pickup	10	12	38,160	5,250	2.6	1.04	16.30
SQT Blank-Fire & Maneuver	24	MTVR	2	29	2,436	27,900	14.0	2.20	2.21
	24	Pickup	3	29	3,654	5,250	2.6	1.04	1.56
	24	ERV	2	29	2,436	6,000	3.0	1.10	1.11
	24	ATV	2	29	2,436	650	0.3	0.40	0.41
ULT Blank-Fire & Maneuver	40	HMMWV	5	29	6,090	7,230	3.6	1.20	3.00
	40	Pickup	5	29	6,090	5,250	2.6	1.04	2.60
								Total Annual PM10 Emissions	53.65

Table 2. Annual Miles Driven by USMC Vehicles in Support of PROPOSED USMC Training Activities									
Training Activity Type	# of Training Events per Year	Vehicle Type	# of Vehicles	Miles per	Total Annual Miles per Vehicle	Vehicle Weight	Vehicle weight	PM10 emissions	Annual PM10
TALONEX/WTI	2	HMMWV	15	160	4,800	7,230	3.6	1.20	2.37
TALONEX/WTI	2	MTVR	20	96	3,840	27,900	14.0	2.20	3.48
								Total Annual PM10 Emissions	5.85
								Total Annual PM10 Emissions - Baseline	59.50

Notes:

[1]Representative vehicles used to determine weights:

ERV: F-250, 6,000 lb curb weight
Pickup truck: 5,250 lb (2.6 tons) gross vehicle weight (e.g., Toyota Tundra)
MTVR: Oshkosh MK23 Cargo, 27,900 lb curb weight
ATV: Yamaha Grizzy 4x4, 650 lb "wet" weight
HMMWV :M1165A1, 7,230 lb curb weight
LVS: MK48/14, 40,300 lb curb weight
ITV/EFSS: General Dynamics Prime Mover, 3900 lb vehicle weight
M1A1: 63 short tons (126,000 lb)
AAV: 29.1 tons (58,200 lb)
MRAP: Cougar, 32,000 lb curb weight
FMTV/HIM ARS: M142, 24,000 lb

[2]Formula for PM10 emissions:

E=1.5(silt content/12)^0.9 * (vehicle weight/3)^0.45

Assumes average silt content is 8.5%.

Baseline: All miles are assumed to be driven on un-paved, dirt roads with no dust minimization measures in use.

Proposed Action:
Assumes average silt content is 8.5%.
Applicable *de minimis* level for the project area (Salton Sea Air Basin - Riverside and Imperial Counties):
70 tons/year for PM10 (serious nonattainment area)
Estimated number of miles based on amount of training expected to occur in Imperial County.

Source:
USEPA. 2006. Compilation of Air Pollutant Emission Factors (AP 42), Fifth Edition, Volume I, Section 13.2.2: Unpaved Roads. Available online at:
http://www.epa.gov/ttn/chief/ap42/ch13/.

No-Action Alternative Emissions Summary

Baseline Emissions (tons/year)										
CO	Nox	ROG	Sox	PM10	PM2.5	CO2	CH4	N2O	CO2e	CO2e (metric tons)
2.07	3.22	0.25	0.08	60.43	0.08	1022.79	0.04	0.07	1,045	948

No-Action Alternative - Imperial County - Total Emissions (tons/year)										
CO	Nox	ROG	Sox	PM10	PM2.5	CO2	CH4	N2O	CO2e	CO2e (metric tons)
1.34	2.09	0.16	0.05	39.28	0.05	664.81	0.03	0.05	679.25	616.20

No-Action Alternative - Riverside County - Total Emissions (tons/year)										
CO	Nox	ROG	Sox	PM10	PM2.5	CO2	CH4	N2O	CO2e	CO2e (metric tons)
0.72	1.13	0.09	0.03	21.15	0.03	357.98	0.01	0.02	365.75	331.80

Daily* Estimate Fugitive Dust (tons/day)

	PM10	PM2.5
Imperial County	0.16	0.000
Riverside County	0.09	0.000

Note: Assumes 240 days of operations per year

Alternative 1 Operations and Description

	General Range Training Activity	Duration, hours	Operations (b)	No. of Personnel	Ground Vehicles	Number of Vehicles	Miles per vehicle	Vehicle-miles per year	Aircraft	Number of aircraft	Hours of operation per year	Aircraft per year	Ordnance	Number of ordnance assumed
	NSW Training													
1	5.56 mm static SQT	4.0	103	13 to 26	ERV	2	0.25	51.5	None	0	0	0	5.56 mm rounds	2803306
	5.56 mm static ULT		103		Pickup	1	0.25	25.75	None	0	0	0		
2	7.62 mm static SQT	4.0	96	13 to 26	ERV	2	0.25	48	None	0	0	0	7.62 mm rounds	2788370
	7.62 mm static ULT		96		Pickup	1	0.25	24	None	0	0	0		
3	0.5 caliber static SQT	5.0	21	18 to 19	ERV	2	0.25	10.5	None	0	0	0	0.5 caliber	94944
	0.5 caliber static NSW		21		Pickup	1	0.25	5.25	None	0	0	0		
4	HELO sniping	5.0	44	8 to 12	None	0	0	0	HH60H	1	72	72		
5	Explosive projectiles SQT	5.0	119	16 to 18	MTVR	2	1.7	404.6	None	0	0	0	40 mm and TP grenades	23992
			119		Pickup	3	1.7	606.9					84 mm M3 Karl Gustav	1162
			119		ERV	2	1.7	404.6						
	Explosive projectiles ULT	5.0	119		Pickup	10	1.7	2023						
6	Mortar ULT	3.5	11	12	Pickup	10	2.3	253	None	0	0	0	60 mm Mortar	2187
7	In-place demolitions SQT	5.0	29	6 to 23	MTVR	2	2.3	133.4	None	0	0	0	Anti-Personnel Mines	360
	In-place demolitions SQT		29		Pickup	3	2.3	200.1					Demolition Blocks/shaped charges (2.5 lbs	1080
	In-place demolitions SQT		29		ERV	2	2.3	133.4					Demolition Blocks/shaped charges (50 lbs)	72
	In-place demolitions ULT		29		Pickup	10	2.3	667					Detonating cord	54000
8	Dry-fire and maneuver SQT	6.0	101	11 to 22	MTVR	2	12	2424	None	0	0	0	Smokes, flares, etc.	38820
	Dry-fire and maneuver SQT		101		Pickup	3	12	3636						
	Dry-fire and maneuver SQT		101		ERV	2	12	2424						
	Dry-fire and maneuver SQT		101		ATV	2	12	2424						
	Dry-fire and maneuver ULT		101		Pickup	10	12	12120						
9	LFAM SQT	5.0	385	5 to 22	MTVR	2	12	9240	None	0	0	0	9 mm	10000
	LFAM SQT		385		Pickup	3	12	13860					Hand Grenades	784
	LFAM SQT		385		ERV	2	12	9240						
	LFAM SQT		385		ATV	2	12	9240						
	LFAM ULT		385		Pickup	10	12	46200						
10	Blank-fire and maneuver SQT	18.0	116	15 to 35	MTVR	2	29	6728	None	0	0	0	LAAW	568
	Blank-fire and maneuver SQT		116		Pickup	3	29	10092						
	Blank-fire and maneuver SQT		116		ERV	2	29	6728						
	Blank-fire and maneuver SQT		116		ATV	2	29	6728						
	Blank-fire and maneuver ULT		116		HMMWV	5	29	16820						
	Blank-fire and maneuver ULT		116		Pickup	5	29	16820						
	Totals		3865											
	USMC Training													
1	Marine Aviation and Weapons Tactics Squadron One Weapons and Tactics Instructors Course, MEU SOC Tactical, Infantry Battalion Training, and MARSOC Tactical Training	336.0	4		HMMWV	45	150	27000	MV22	12	120		5.56 mm (all rounds)	3000000
			4		MTVR	40	350	56000	F/A-18	0	0		60 mm mortar	12000
			4		LVS	5	500	10000	AV-8B	0	0		40 mm TP	60000
			4		ITV	15	50	3000	JSF	0	0		40 mm M203 TP	12000
			4		M1A1 Tank	5	60	1200	KC-130	0	0		7.62 (all rounds)	200000
			4		AAV	15	60	3600	CH-53E	12	120		.50 Cal (all rounds	200000
			4		MRAP	30	150	18000	AH-1	12	120		81mm mortar	12000
			4		FMTV	15	150	9000	UH-1	12	240		9mm	20000
													120mm WP	400
	Totals		32											

(a) Days = the number of days per operation
(b) Operations = the number of operations per year

Alternative 1 Operations and Description

Operation	Type Training	Days (a)	Operations (b)	Aircraft	Number	Total Hours	Emissions Factors (lb/operation) (c)								Emissions (lbs)							
						Hours	CO	NOx	ROG	SOx	PM10	CO2	CH4	N2O	CO	Nox	ROG	Sox	PM	CO2	CH4	N2O
	NSW Training																					
1	5.56 mm static SQT	4	103	None	0																	
2	7.62 mm static SQT	4	96	None	0																	
3	0.5 caliber static SQT	5	21	None	0																	
4	HELO sniping	5	44	HH60H	72	336.0	7.50	7.68	0.66	0.48	5.04	3859.20	0.11	0.12	2520	2580.48	221.76	161.28	1693.44	1296691	35.8848	40.32
5	Explosive projectiles SQT	5	119	None	0																	
6	Mortar ULT	3.5	11	None	0																	
7	In-place demolitions SQT	5	29	None	0																	
8	Dry-fire and maneuver SQT	6	101	None	0																	
9	LFAM SQT	5	385	None	0																	
10	Blank-fire and maneuver SQT	18	116	None	0																	
	USMC Training																					
1	Marine Aviation and Weapons Tactics Squadron One Weapons and Tactics Instructors Course, MEU SOC Tactical, Infantry Battalion Training, and MARSOC Tactical Training	336		MV22	12	192	0.29	8.87	0.01	0.24	0.94	1899	0.05	0.06	55.68	1703.04	1.92	46.08	180.48	364608	10.1161	11.3664
				F/A-18	0	0	37.8594	104.0432	6.82404	6.21642	98.6214	14568.86	0.41	0.47	0	0	0	0	0	0	0	0
				AV-8B	0	0	69.01	25.45	3.8	1.73	22.86	13443.62	0.38	0.43	0	0	0	0	0	0	0	0
				JSF	0	0	6.5	68.6	1.23	5.09	28.91	1206.279	0.03	0.04	0	0	0	0	0	0	0	0
				KC-130	0	0	9.315	36.72	2.115	1.8	17.865	14026.5	0.3924	0.45045	0	0	0	0	0	0	0	0
				CH-53E	12	192	1.94	4.03	0.52	0.22	1.19	1737.62	0.05	0.05	372.48	773.76	99.84	42.24	228.48	333623	9.22752	10.368
				AH-1	12	48	0.69	0.32	0.03	0.02	0.25	192.18	0.01	0.01	33.12	15.36	1.44	0.96	12	9224.64	0.25632	0.288
				UH-1	12	192	0.13	0.25	0.01	0.02	0.21	157.94	0.00	0.00	24.96	48	1.92	3.84	40.32	30324.48	0.841926	0.945984
											PM10	PM2.5										
	Fugitive Dust Emissions from Pad Landings			MV-22	12	192					8.87	4.43							1703.04			
				CH-53E	12	192					2.53	0.38							485.76			
				AH-1	12	48					0.41	0.06							19.68			
				UH-1	12	192					0.46	0.07							88.32			
										pounds/year					**3006.24**	**5120.64**	**326.88**	**254.4**	**4451.52**	**2034471.4**	**56.326662**	**63.288384**
										tons/year					**1.50312**	**2.56032**	**0.16344**	**0.1272**	**2.22576**	**1017.2357**	**0.0281633**	**0.0316442**

(a) Days = the number of days per operation
(b) Operations = the number of operations per year
(c) Assume 1 Pad Landings per aircraft per hour for rotary wing aircraft; assume cruise for fixed wing aircraft.
Emissions for Mission Operations from AESO
1- hour cruise emissions
AESO Memoranda:

MV-22	9965 Rev B
F/A-18	9815 Rev F
AV-8B	9963 Rev A
JSF	From JSF EIS, 2010
KC-130	2000-10B
CH-53E	
AH-1	
UH-1	

Pad Landing Fugitive Dust emissions from MV-22 EA for CH-43, UH-1 and AH-1, on paved and unpaved landing pads.

Table 3 Ground Vehicles Emissions Alternative 1

Alternative 1 Operations and Description

Scenario	Type Training	Days (a)	Operations (b)	Ground Vehicles	Number	Miles per operation	Total Miles	Miles/hour	Hours	horsepower	Emissions Factors (grams/VMT or g/hp-hr) CO	NOx	ROG	SOx	PM10	PM2.5	CO2	CH4	N2O	Emissions (lbs) CO	Nox	ROG	Sox	PM10	PM2.5	CO2	CH4	N2O
1	5.56 mm static SQT	1	103	ERV	2	0.25	51.5	15	3.433333	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	2.2595737	5.569881	0.387007	0.009848324	0.216193	0.216193	1003.362	0.068671	0.141885
	5.56 mm static ULT	1	103	Pickup	1	0.25	25.75	15	1.716667	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	0.0250448	0.028799	0.00429	0.000340616	0.00354	0.003257	19.63099	0.000199	0.001198
2	7.62 mm static SQT	1	96	ERV	2	0.25	48	15	3.2	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	2.1060105	5.191345	0.360706	0.009179021	0.2015	0.2015	935.1722	0.064004	0.132242
	7.62 mm static ULT	1	96	Pickup	1	0.25	24	15	1.6	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	0.0233427	0.026842	0.003998	0.000317467	0.003299	0.003036	18.29685	0.000186	0.001117
3	0.5 caliber static SQT	1	21	ERV	2	0.25	10.5	15	0.7	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	0.4606898	1.135607	0.078904	0.002007911	0.044078	0.044078	204.5689	0.014001	0.028928
	0.5 caliber static NSW	1	21	Pickup	1	0.25	5.25	15	0.35	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	0.0051062	0.005872	0.000875	6.9446E-05	0.000722	0.000664	4.002436	4.06E-05	0.000244
4	HELO sniping	1	44	None	0	0	0																					
5	Explosive projectiles SQT	1	119	MTVR	2	1.7	404.6	15	26.97333	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	17.751913	43.75871	3.040447	0.077371496	1.698481	1.698481	7882.722	0.539499	1.114693
		1	119	Pickup	3	1.7	606.9	15	40.46	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	0.5902788	0.678764	0.101105	0.008027955	0.083436	0.076761	462.6816	0.004696	0.028237
		1	119	ERV	2	1.7	404.6	15	26.97333	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	17.751913	43.75871	3.040447	0.077371496	1.698481	1.698481	7882.722	0.539499	1.114693
	Explosive projectiles ULT	1	119	Pickup	10	1.7	2023	15	134.8667	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	1.967596	2.262546	0.337017	0.026759849	0.27812	0.25587	1542.272	0.015654	0.094122
6	Mortar ULT	1	11	Pickup	10	2.3	253	15	16.86667	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	0.2460711	0.282958	0.042148	0.003346635	0.034782	0.032	192.8793	0.001958	0.011771
7	In-place demolitions SQT	1	29	MTVR	2	2.3	133.4	15	8.893333	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	5.8529541	14.42761	1.002461	0.025510029	0.560003	0.560003	2598.999	0.177877	0.367524
	In-place demolitions SQT	1	29	Pickup	3	2.3	200.1	15	13.34	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	0.1946199	0.223794	0.033335	0.002646884	0.02751	0.025309	152.55	0.001548	0.00931
	In-place demolitions SQT	1	29	ERV	2	2.3	133.4	15	8.893333	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	5.8529541	14.42761	1.002461	0.025510029	0.560003	0.560003	2598.999	0.177877	0.367524
	In-place demolitions ULT	1	29	Pickup	10	2.3	667	15	44.46667	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	0.6487328	0.74598	0.111117	0.008822946	0.091698	0.084363	508.4999	0.005161	0.031033
8	Dry-fire and maneuver SQT	1	101	MTVR	2	12	2424	15	161.6	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	106.35353	262.1629	18.21563	0.463540552	10.17577	10.17577	47226.19	3.232193	6.678242
	Dry-fire and maneuver SQT	1	101	Pickup	3	12	3636	15	242.4	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	3.5364207	4.066542	0.60573	0.048096298	0.499874	0.459884	2771.973	0.028135	0.169168
	Dry-fire and maneuver SQT	1	101	ERV	2	12	2424	15	161.6	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	106.35353	262.1629	18.21563	0.463540552	10.17577	10.17577	47226.19	3.232193	6.678242
	Dry-fire and maneuver SQT	1	101	ATV	2	12	2424	15	161.6	300	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	79.765146	196.6222	13.66172	0.347655414	7.631829	7.631829	35419.65	2.424144	5.008682
	Dry-fire and maneuver ULT	1	101	Pickup	10	12	12120	15	808	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	11.788069	13.55514	2.019101	0.160320995	1.666245	1.532945	9239.909	0.093783	0.563894
9	LFAM SQT	1	385	MTVR	2	12	9240	15	616	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	405.40701	999.3339	69.43582	1.766961509	38.78884	38.78884	180020.6	12.32073	25.45667
	LFAM SQT	1	385	Pickup	3	12	13860	15	924	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	13.480416	15.50118	2.308972	0.183337375	1.905458	1.753022	10566.43	0.107247	0.644849
	LFAM SQT	1	385	ERV	2	12	9240	15	616	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	405.40701	999.3339	69.43582	1.766961509	38.78884	38.78884	180020.6	12.32073	25.45667
	LFAM SQT	1	385	ATV	2	12	9240	15	616	300	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	304.05526	749.5005	52.07687	1.325221132	29.09163	29.09163	135015.5	9.240551	19.0925
	LFAM ULT	1	385	Pickup	10	12	46200	15	3080	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	44.934719	51.67059	7.696572	0.611124584	6.351528	5.843406	35221.43	0.357491	2.149497
10	Blank-fire and maneuver SQT	1	116	MTVR	2	29	6728	15	448.5333	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	295.19247	727.6535	50.5589	1.286592752	28.24365	28.24365	131080	8.971201	18.53598
	Blank-fire and maneuver SQT	1	116	Pickup	3	29	10092	15	672.8	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	9.81561	11.287	1.681251	0.133495007	1.387438	1.276443	7693.825	0.078091	0.469539
	Blank-fire and maneuver SQT	1	116	ERV	2	29	6728	15	448.5333	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	295.19247	727.6535	50.5589	1.286592752	28.24365	28.24365	131080	8.971201	18.53598
	Blank-fire and maneuver SQT	1	116	ATV	2	29	6728	15	448.5333	300	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	221.39435	545.7402	37.91917	0.964944564	21.18273	21.18273	98309.97	6.728401	13.90198
	Blank-fire and maneuver ULT	1	116	HMMWV	5	29	16820	15	1121.333	192	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	354.23096	873.1843	60.67068	1.543911303	33.89237	33.89237	157296	10.76544	22.24318
	Blank-fire and maneuver ULT	1	116	Pickup	5	29	16820	15	1121.333	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	16.35935	18.81167	2.802085	0.222491678	2.312396	2.127405	12823.04	0.130152	0.782566
	Totals		###																	2729.0031	6590.765	467.4092	12.85191808	265.8399	264.6682	1247019	80.61256	169.8122
1	Marine Aviation and Weapons Tactics Squadron One Weapons and Tactics Instructors Course, MEU SOC Tactical, Infantry Battalion Training, and MARSOC Tactical Training	1	4	HMMWV	45	150	27000	15	1800																			
										360	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	1066.1678	2628.118	182.6072	4.646879293	102.0096	102.0096	473430.9	32.40193	66.94773
			4	MTVR	40	350	56000	15	3733.333	360	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	2211.311	5450.912	378.7408	9.637971868	211.5755	211.5755	981930.8	67.20401	138.8545
			4	LVS	5	500	10000	15	666.6667	192	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	210.60105	519.1345	36.07056	0.917902083	20.15004	20.15004	93517.22	6.400381	13.22424
			4	ITV	15	50	3000	15	200	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	131.62565	324.4591	22.5441	0.573688802	12.59378	12.59378	58448.26	4.000238	8.265151
			4	M1A1 Tank	5	60	1200	15	80	445	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	58.573416	144.3843	10.03212	0.255291517	5.604231	5.604231	26009.48	1.780106	3.677992
			4	AAV	15	60	3600	15	240	150	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	59.231544	146.0066	10.14484	0.258159961	5.6672	5.6672	26301.72	1.800107	3.719318
			4	MRAP	30	150	18000	15	1200	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	789.75392	1946.754	135.2646	3.44213281	75.56267	75.56267	350689.6	24.00143	49.59091
			4	FMTV	15	150	9000	15	600	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	394.87696	973.3772	67.63229	1.721066405	37.78133	37.78133	175344.8	12.00072	24.79545
	Totals																			4922.1413	12133.15	843.0365	21.45309274	470.9443	470.9443	2185673	149.5889	309.0753
																			Total, tons/year	3.8255722	9.361956	0.655223	0.017152505	0.368392	0.367806	1716.346	0.115101	0.239444

Days = the number of days per operation
Operations = the number of operations per year

NOTES ERV modeled as off road truck
MTVR and EVR modeled as 400 hp off road truck
Pickup modeled as MDV, diesel
ATV modeled as 300 horsepower off road truck
HMMWV modeled as 192 horsepower off road truck
Emission factors from ARB OFFROAD model

Table 4 Ordnance EmissionsAlternative 1

Alternative 1 Operations and Description						CO	NOX	ROG	SOX	PM10	PM2.5	Lead	CO2	CH4	Emissions, lbs/year								
Scenario	Type Training	Days (a)	Operations (b)	Ordnance	Number	lbs/item	lbs/item	lbs/item	lbs/item	lbs/item	lbs/item	lbs/item	lbs/item	lbs/item	Total CO	Total NOx	Total ROG	Total SOx	Total PM10	Total PM2.5	Total Lead	Total CO2	Total CH4
1	5.56 mm static SQT	4	103	5.56 mm rounds	2803306	1.60E-03	8.50E-05			3.90E-05	2.80E-05	5.10E-06	8.70E-04	9.70E-06	2.24E+00	1.19E-01	0.00E+00	0.00E+00	5.47E-02	3.92E-02	7.15E-03	1.22E+00	1.36E-02
	5.56 mm static ULT		103																				
2	7.62 mm static SQT	4	96	7.62 mm rounds	2788370	2.30E-03	9.70E-05			5.10E-05	3.80E-05	4.90E-06	1.20E-03	1.00E-05	3.21E+00	1.35E-01	0.00E+00	0.00E+00	7.11E-02	5.30E-02	6.83E-03	1.67E+00	1.39E-02
	7.62 mm static ULT		96																				
3	0.5 caliber static SQT	5	21	0.5 caliber	94944	1.10E-02	1.20E-03			3.10E-04	1.90E-04	1.30E-05	5.10E-03	1.30E-04	5.22E-01	5.70E-02	0.00E+00	0.00E+00	1.47E-02	9.02E-03	6.17E-04	2.42E-01	6.17E-03
	0.5 caliber static NSW		21																				
4	HELO sniping	5	44																				
5	Explosive projectiles SQT	5	119	40 mm and TP grenades	23992	2.60E-03	9.70E-05			1.40E-04	1.20E-04	1.10E-03	2.70E-03	5.40E-06	3.12E-02	1.16E-03	0.00E+00	0.00E+00	1.68E-03	1.44E-03	1.32E-02	3.24E-02	6.48E-05
				84 mm M3 Karl Gustav	1162	1.90E-01	4.80E-03			1.20E-02	1.00E-02	1.70E-05	1.90E-01	5.60E-04	1.10E-01	2.79E-03	0.00E+00	0.00E+00	6.97E-03	5.81E-03	9.88E-06	1.10E-01	3.25E-04
	Explosive projectiles ULT		119																				
6	Mortar ULT	3.5	11	60 mm Mortar	2187	5.70E-05	5.70E-04			1.70E-02	1.50E-02	3.20E-05	3.20E-03		6.23E-05	6.23E-04	0.00E+00	0.00E+00	1.86E-02	1.64E-02	3.50E-05	3.50E-03	0.00E+00
7	In-place demolitions SQT	5	29	Anti-Personnel Mines	360	2.00E-02	1.80E-02		9.10E-05	4.90E-02	2.60E-02	5.70E-05	1.60E+00	3.80E-04	3.60E-03	3.24E-03	0.00E+00	1.64E-05	8.82E-03	4.68E-03	1.03E-05	2.88E-01	6.84E-05
	In-place demolitions SQT		29	Demolition Blocks/shaped cha	1080	1.20E-02	3.25E-02		1.00E-04	6.25E-02	3.50E-02	5.00E-04	3.00E+00		6.48E-03	1.76E-02	0.00E+00	5.40E-05	3.38E-02	1.89E-02	2.70E-04	1.62E+00	0.00E+00
	In-place demolitions SQT		29	Demolition Blocks/shaped cha	72	3.15E-01	3.45E-01			1.75E+00	7.00E-01	1.85E-01	6.50E+01		1.13E-02	1.24E-02	0.00E+00	0.00E+00	6.30E-02	2.52E-02	6.66E-03	2.34E+00	0.00E+00
	In-place demolitions ULT		29	Detonating cord	54000	1.10E-03	2.60E-04			2.80E-03	2.00E-03	1.50E-05	5.70E-03	1.80E-05	2.97E-02	7.02E-03	0.00E+00	0.00E+00	7.56E-02	5.40E-02	4.05E-04	1.54E-01	4.86E-04
8	Dry-fire and maneuver SQT	6	101	Smokes, flares, etc.	38820	7.50E-03	2.50E-03	2.40E-04	7.10E-05	5.00E-02	5.00E-02	3.80E-06	1.80E-01		1.46E-01	4.85E-02	4.66E-03	1.38E-03	9.71E-01	9.71E-01	7.38E-05	3.49E+00	0.00E+00
	Dry-fire and maneuver SQT		101																				
	Dry-fire and maneuver SQT		101																				
	Dry-fire and maneuver SQT		101																				
	Dry-fire and maneuver ULT		101																				
9	LFAM SQT	5	385	9 mm	10000	3.10E-04	1.50E-05		8.20E-07	2.40E-05	2.00E-05	6.80E-06	2.00E-04	1.40E-06	1.55E-03	7.50E-05	0.00E+00	4.10E-06	1.20E-04	1.00E-04	3.40E-05	1.00E-03	7.00E-06
	LFAM SQT		385	Hand Grenades	784	1.10E-05	4.00E-05	3.20E-07		1.10E-04	9.40E-05		1.70E-04		4.31E-06	1.57E-05	1.25E-07	0.00E+00	4.31E-05	3.68E-05	0.00E+00	6.66E-05	0.00E+00
	LFAM SQT		385																				
	LFAM SQT		385																				
	LFAM ULT		385																				
10	Blank-fire and maneuver SQT	18	116	LAAW	568	4.30E-05	2.50E-03	7.30E-06	7.60E-05	1.40E-02	1.30E-02		1.10E-02		1.22E-05	7.10E-04	2.07E-06	2.16E-05	3.98E-03	3.69E-03	0.00E+00	3.12E-03	0.00E+00
	Blank-fire and maneuver SQT		116																				
	Blank-fire and maneuver SQT		116																				
	Blank-fire and maneuver SQT		116																				
	Blank-fire and maneuver ULT		116																				
	Blank-fire and maneuver ULT		116																				
	Totals		###											lbs/year	6.31E+00	4.05E-01	4.66E-03	1.47E-03	1.32E+00	1.20E+00	3.53E-02	1.12E+01	3.47E-02
														Subtotal, tons/year	3.16E-03	2.03E-04	2.33E-06	7.37E-07	6.62E-04	6.01E-04	1.76E-05	5.59E-03	1.73E-05
1	Marine Aviation and Weapons Tactics Squadron One Weapons and Tactics Instructors Course, MEU SOC Tactical, Infantry Battalion Training, and MARSOC Tactical Training	336	4																				
				5.56 mm (all rounds)	3000000	1.60E-03	8.50E-05			3.90E-05	2.80E-05	5.10E-06	8.70E-04	9.70E-06	2.40E+00	1.28E-01	0.00E+00	0.00E+00	5.85E-02	4.20E-02	7.65E-03	1.31E+00	1.46E-02
			4	60 mm mortar	12000	5.70E-05	5.70E-04			1.70E-02	1.50E-02	3.20E-05	3.20E-03		3.42E-04	3.42E-03	0.00E+00	0.00E+00	1.02E-01	9.00E-02	1.92E-04	1.92E-02	0.00E+00
			4	40 mm TP	60000	2.60E-03	9.70E-05			1.40E-04	1.20E-04	1.10E-03	2.70E-03	5.40E-06	7.80E-02	2.91E-03	0.00E+00	0.00E+00	4.20E-03	3.60E-03	3.30E-02	8.10E-02	1.62E-04
			4	40 mm M203 TP	12000	2.60E-03	9.70E-05			1.40E-04	1.20E-04	1.10E-03	2.70E-03	5.40E-06	1.56E-02	5.82E-04	0.00E+00	0.00E+00	8.40E-04	7.20E-04	6.60E-03	1.62E-02	3.24E-05
			4	7.62 (all rounds)	200000	2.30E-03	9.70E-05			5.10E-05	3.80E-05	4.90E-06	1.20E-03	1.00E-05	2.30E-01	9.70E-03	0.00E+00	0.00E+00	5.10E-03	3.80E-03	4.90E-04	1.20E-01	1.00E-03
			4	.50 Cal (all rounds	200000	1.10E-02	1.20E-03			3.10E-04	1.90E-04	1.30E-05	5.10E-03	1.30E-04	1.10E+00	1.20E-01	0.00E+00	0.00E+00	3.10E-02	1.90E-02	1.30E-03	5.10E-01	1.30E-02
			4	81mm mortar	12000	9.70E-02	1.60E-02			1.70E-01	9.30E-02	6.90E-04	1.40E+00	1.50E-03	5.82E-01	9.60E-02	0.00E+00	0.00E+00	1.02E+00	5.58E-01	4.14E-03	8.40E+00	9.00E-03
			4	9mm	20000	3.1E-04	1.5E-05		8.2E-08	2.4E-05	2.0E-05		2.0E-04	1.4E-06	3.10E-03	1.50E-04	0.00E+00	8.20E-07	2.40E-04	2.00E-04	0.00E+00	2.00E-03	1.40E-05
														lbs/year	4.41E+00	3.60E-01	0.00E+00	8.20E-07	1.22E+00	7.17E-01	5.34E-02	1.05E+01	3.78E-02
														Subtotal, tons/year	2.20E-03	1.80E-04	0.00E+00	4.10E-10	6.11E-04	3.59E-04	2.67E-05	5.23E-03	1.89E-05
														Total, tons/year	5.36E-03	3.83E-04	2.33E-06	7.37E-07	1.27E-03	9.60E-04	4.43E-05	1.08E-02	3.62E-05

NOTES Emission factors from AP-42, Chapter 15.
5.56-mm rounds from M-855 5.56 mm ball cartridge
7.62-mm rounds from M-80 7.62 mm ball cartridge
0.5 caliber from A557 M33 ball and M17 tracer cartridge
40 mm and TP grenades assumed to be M918 40 mm practice cartridges
Hand Grenades from M228 Practice Hand Grenade
84 mm M3 assumed to be M301A3
9 mm assumed to be M882 ball cartridge
60 mm assumed to be 60 mm full range practice cartridge
Anti-personnel mines assumed to be M18A1 antipersonnel mine
LAAW assumed to be M22 Anti-tank guided missile and rocket simulator
Demolition blocks/shaped charges 2.5 lbs NEW max assumed to be 1 lb blocks
Demolition blocks/shaped charges 50 lbs NEW max assumed to be 15 lb blocks
Detonating cord assumed to be M732 Proximity Fuse
Smoke, flare, etc assumed to be M159 White Star Cluster Signal Flare

Vehicle mileage data provided by NSW and USMC.

Total Vehicle Miles: Existing Activity

Table 1. Annual Miles Driven by NSW Vehicles in Support of EXISTING NSW Training Activities									
Training Activity Type	# Training Events per Year Using Vehicles	Vehicle Type	# of Vehicles (by type)	Miles per vehicle	Total Annual Miles per Vehicle Type (per training	Vehicle Weight (lbs)[1]	Vehicle weight (tons)	PM10 emissions per mile (lb/VMT)[2]	Annual PM10 emissions (tons/year)
SQT 5.56mm Static	36	ERV	2	0.25	50	6,000	3.0	1.10	0.02
ULT 5.56mm Static	63	Pickup	1	0.25	25	5,250	2.6	1.04	0.01
SQT 7.62mm Static	18	ERV	2	0.25	45	6,000	3.0	1.10	0.02
ULT 7.62mm Static	72	Pickup	1	0.25	23	5,250	2.6	1.04	0.01
SQT .50 cal Static	6	ERV	2	0.25	11	6,000	3.0	1.10	0.00
NSWC N4 .50 cal Weapons	15	Pickup	1	0.25	5	5,250	2.6	1.04	0.00
SQT Explosive Projectiles	6	MTVR	2	1.7	65	27,900	14.0	2.20	0.06
	6	Pickup	3	1.7	97	5,250	2.6	1.04	0.04
	6	ERV	2	1.7	65	6,000	3.0	1.10	0.03
ULT Explosive Projectiles	97	Pickup	10	1.7	323	5,250	2.6	1.04	0.14
ULT Mortar	9	Pickup	10	2.3	207	5,250	2.6	1.04	0.09
SQT In-place Demolitions	18	MTVR	2	2.3	124	27,900	14.0	2.20	0.11
	18	Pickup	3	2.3	186	5,250	2.6	1.04	0.08
	18	ERV	2	2.3	124	6,000	3.0	1.10	0.06
ULT In-Place Demolitions	9	Pickup	10	2.3	621	5,250	2.6	1.04	0.27
SQT Dry-Fire & Maneuver	24	MTVR	2	12	2,088	27,900	14.0	2.20	1.89
	24	Pickup	3	12	3,132	5,250	2.6	1.04	1.34
	24	ERV	2	12	2,088	6,000	3.0	1.10	0.95
	24	ATV	2	12	2,088	650	0.3	0.40	0.35
ULT Dry-Fire & Maneuver	63	Pickup	10	12	10,440	5,250	2.6	1.04	4.46
SQT Live-Fire & Maneuver	120	MTVR	2	12	7,632	27,900	14.0	2.20	6.91
	120	Pickup	3	12	11,448	5,250	2.6	1.04	4.89
	120	ERV	2	12	7,632	6,000	3.0	1.10	3.46
	120	ATV	2	12	7,632	650	0.3	0.40	1.27
ULT Live-Fire & Maneuver	192	Pickup	10	12	38,160	5,250	2.6	1.04	16.30
SQT Blank-Fire & Maneuver	24	MTVR	2	29	2,436	27,900	14.0	2.20	2.21
	24	Pickup	3	29	3,654	5,250	2.6	1.04	1.56
	24	ERV	2	29	2,436	6,000	3.0	1.10	1.11
	24	ATV	2	29	2,436	650	0.3	0.40	0.41
ULT Blank-Fire & Maneuver	40	HMMWV	5	29	6,090	7,230	3.6	1.20	3.00
	40	Pickup	5	29	6,090	5,250	2.6	1.04	2.60
								Total Annual PM10 Emissions	53.65

Table 2. Annual Miles Driven by USMC Vehicles in Support of PROPOSED USMC Training Activities									
Training Activity Type	# of Training Events per Year	Vehicle Type	# of Vehicles (by type)	Miles per vehicle	Total Annual Miles per Vehicle Type (per training	Vehicle Weight (lbs)	Vehicle weight (tons)	PM10 emissions per mile (lb/VMT)[2]	Annual PM10 emissions (tons/year)
TALONEX/WTI	2	HMMWV	15	160	4,800	7,230	3.6	1.20	2.37
TALONEX/WTI	2	MTVR	20	96	3,840	27,900	14.0	2.20	3.48
								Total Annual PM10 Emissions	5.85
								Total Annual PM10 Emissions - Baseline	59.50

Total Vehicle Miles: Proposed Activity

Table 3. Annual Miles Driven by NSW Vehicles in Support of PROPOSED NSW Training Activities									
Training Activity Type	# Training Events per Year Using Vehicles	Vehicle Type	# of Vehicles (by type)	Miles per vehicle	Total Annual Miles per Vehicle Type (per training	Vehicle Weight (lbs)	Vehicle weight (tons)	PM10 emissions per mile (lb/VMT)[2]	Annual PM10 emissions (tons/year)
SQT 5.56mm Static	36	ERV	2	0.25	52	6,000	3.0	1.10	0.02
ULT 5.56mm Static	67	Pickup	1	0.25	26	5,250	2.6	1.04	0.01
SQT 7.62mm Static	18	ERV	2	0.25	48	6,000	3.0	1.10	0.02
ULT 7.62mm Static	72	Pickup	1	0.25	24	5,250	2.6	1.04	0.01
SQT .50 cal Static	6	ERV	2	0.25	11	6,000	3.0	1.10	0.00
NSWC N4 .50 cal Weapons	15	Pickup	1	0.25	5	5,250	2.6	1.04	0.00
SQT Explosive Projectiles	6	MTVR	2	1.7	405	27,900	14.0	2.20	0.37
	6	Pickup	3	1.7	607	5,250	2.6	1.04	0.26
	6	ERV	2	1.7	405	6,000	3.0	1.10	0.18
ULT Explosive Projectiles	113	Pickup	10	1.7	2,023	5,250	2.6	1.04	0.86
ULT Mortar	11	Pickup	10	2.3	253	5,250	2.6	1.04	0.11
SQT In-place Demolitions	18	MTVR	2	2.3	133	27,900	14.0	2.20	0.12
	18	Pickup	3	2.3	200	5,250	2.6	1.04	0.09
	18	ERV	2	2.3	133	6,000	3.0	1.10	0.06
ULT In-Place Demolitions	11	Pickup	10	2.3	667	5,250	2.6	1.04	0.28
SQT Dry-Fire & Maneuver	24	MTVR	2	12	2,424	27,900	14.0	2.20	2.20
	24	Pickup	3	12	3,636	5,250	2.6	1.04	1.55
	24	ERV	2	12	2,424	6,000	3.0	1.10	1.10
	24	ATV	2	12	2,424	650	0.3	0.40	0.40
ULT Dry-Fire & Maneuver	67	Pickup	10	12	12,120	5,250	2.6	1.04	5.18
SQT Live-Fire & Maneuver	120	MTVR	2	12	9,240	27,900	14.0	2.20	8.37
	120	Pickup	3	12	13,860	5,250	2.6	1.04	5.92
	120	ERV	2	12	9,240	6,000	3.0	1.10	4.19
	120	ATV	2	12	9,240	650	0.3	0.40	1.54
ULT Live-Fire & Maneuver	259	Pickup	10	12	46,200	5,250	2.6	1.04	19.74
SQT Blank-Fire & Maneuver	24	MTVR	2	29	6,728	27,900	14.0	2.20	6.09
	24	Pickup	3	29	10,092	5,250	2.6	1.04	4.31
	24	ERV	2	29	6,728	6,000	3.0	1.10	3.05
	24	ATV	2	29	6,728	650	0.3	0.40	1.12
ULT Blank-Fire & Maneuver	22	HMMWV	5	29	16,820	7,230	3.6	1.20	8.30
	22	Pickup	5	29	16,820	5,250	2.6	1.04	7.19
								Total Annual PM10 Emissions	82.67

Table 4. Annual Miles Driven by USMC Vehicles in Support of PROPOSED USMC Training Activities									
Training Activity Type	# of Training Events per Year	Vehicle Type	# of Vehicles (by type)	Miles per vehicle	Total Annual Miles per Vehicle Type (per training	Vehicle Weight (lbs)	Vehicle weight (tons)	PM10 emissions per mile (lb/VMT)[2]	Annual PM10 emissions (tons/year)
TALONEX/WTI	2	LVS	2	30	120	40,300	20.2	2.59	0.13
TALONEX/WTI	2	ITV/EFSS	6	12	144	3,900	2.0	0.91	0.05
TALONEX/WTI	2	M1A1 TANK	NA	0	0	126,000	63.0	4.33	0.00
TALONEX/WTI	2	AAV	NA	0	0	58,200	29.1	3.06	0.00
TALONEX/WTI	2	MRAP	NA	0	0	32,000	16.0	2.34	0.00
TALONEX/WTI	2	FMTV/HIM ARS	12	32	768	24,000	12.0	2.05	0.65
TALONEX/WTI	2	4x4 TRUCK	8	128	2,048	5,250	2.6	1.04	0.87
								Total Annual PM10 Emissions	1.71

Total Annual PM10 Emissions from NSW and USMC Activities - Proposed Action[3]	54.84
Delta (Annual Emissions due to the Proposed Action only)	-4.66

Notes:

[1]Representative vehicles used to determine weights:

ERV: F-250, 6,000 lb curb weight
Pickup truck: 5,250 lb (2.6 tons) gross vehicle weight (e.g., Toyota Tundra)
MTVR: Oshkosh MK23 Cargo, 27,900 lb curb weight
ATV: Yamaha Grizzy 4x4, 650 lb "wet" weight
HMMWV :M1165A1, 7,230 lb curb weight
LVS: MK48/14, 40,300 lb curb weight
ITV/EFSS: General Dynamics Prime Mover, 3900 lb vehicle weight
M1A1: 63 short tons (126,000 lb)
AAV: 29.1 tons (58,200 lb)
MRAP: Cougar, 32,000 lb curb weight
FMTV/HIM ARS: M142, 24,000 lb

[2]Formula for PM10 emissions:

E=1.5(silt content/12)^0.9 * (vehicle weight/3)^0.45

Assumes average silt content is 8.5%.

[3] Fugitive Dust Controls included in Total Emissions:

Alt 1: Assume 50% of miles are on major access roads treated with dust palliative, 70% control efficiency

Baseline: All miles are assumed to be driven on un-paved, dirt roads with no dust minimization measures in use.

Summary of Annual Operational Emissions - Alternative 1

Total Annual Operational Emissions Resulting from Implementation of Alternative 1									
Emissions (tons/year)									
CO	NOx	ROG	SOx	PM10	PM2.5	CO2	CH4	N2O	CO2e (metric tons)
5.33	11.92	0.82	0.14	57.44	0.37	2,733.59	0.14	0.27	2,556

Annual Operational Emissions Resulting from Implementation of Alternative 1 in Imperial County									
Emissions (tons/year)									
CO	NOx	ROG	SOx	PM10	PM2.5	CO2	CH4	N2O	CO2e (metric tons)
3.47	7.75	0.53	0.09	37.33	0.24	1,776.83	0.09	0.18	1,661.40

Annual Operational Emissions Resulting from Implementation of Alternative 1 in Riverside County									
Emissions (tons/year)									
CO	NOx	ROG	SOx	PM10	PM2.5	CO2	CH4	N2O	CO2e (metric tons)
1.87	4.17	0.29	0.05	20.10	0.13	956.76	0.05	0.09	894.60

Proposed Action:
Assumes average silt content is 8.5%.
Applicable *de minimis* level for the project area (Salton Sea Air Basin - Riverside and Imperial Counties):
70 tons/year for PM10 (serious nonattainment area)
Estimated number of miles based on amount of training expected to occur in Imperial County.
It was assumed that 65 percent of the operational emissions would occur within Imperial County, and 35 percent would occur within Riversi

Source:
USEPA. 2006. Compilation of Air Pollutant Emission Factors (AP 42), Fifth Edition, Volume I, Section

Table 1 Operations Summaries Alternative 2

	General Range Training Activity	Duration, hours	Operations (b)	No. of Personnel	Ground Vehicles	Number of Vehicles	Miles per vehicle	Vehicle-miles per year	Aircraft	Number of aircraft	Hours of operation per year	Aircraft per year	Ordnance	Number of ordnance assumed
	NSW Training													
1	5.56 mm static SQT	4.0	103	13 to 26	ERV	2	0.25	51.5	None	0	0	0	5.56 mm rounds	2803306
	5.56 mm static ULT		103		Pickup	1	0.25	25.75	None	0	0	0		
2	7.62 mm static SQT	4.0	96	13 to 26	ERV	2	0.25	48	None	0	0	0	7.62 mm rounds	2788370
	7.62 mm static ULT		96		Pickup	1	0.25	24	None	0	0	0		
3	0.5 caliber static SQT	5.0	21	18 to 19	ERV	2	0.25	10.5	None	0	0	0	0.5 caliber	94944
	0.5 caliber static NSW		21		Pickup	1	0.25	5.25	None	0	0	0		
4	HELO sniping	5.0	44	8 to 12	None	0	0	0	HH60H	1	72	72		
5	Explosive projectiles SQT	5.0	119	16 to 18	MTVR	2	1.7	404.6	None	0	0	0	40 mm and TP grenades	23992
			119		Pickup	3	1.7	606.9					84 mm M3 Karl Gustav	1162
			119		ERV	2	1.7	404.6						
	Explosive projectiles ULT	5.0	119		Pickup	10	1.7	2023						
6	Mortar ULT	3.5	11	12	Pickup	10	2.3	253	None	0	0	0	60 mm Mortar	2187
7	In-place demolitions SQT	5.0	29	6 to 23	MTVR	2	2.3	133.4	None	0	0	0	Anti-Personnel Mines	360
	In-place demolitions SQT		29		Pickup	3	2.3	200.1					Demolition Blocks/shaped charges (2.5 lbs	1080
	In-place demolitions SQT		29		ERV	2	2.3	133.4					Demolition Blocks/shaped charges (50 lbs	72
	In-place demolitions ULT		29		Pickup	10	2.3	667					Detonating cord	54000
8	Dry-fire and maneuver SQT	6.0	101	11 to 22	MTVR	2	12	2424	None	0	0	0	Smokes, flares, etc.	38820
	Dry-fire and maneuver SQT		101		Pickup	3	12	3636						
	Dry-fire and maneuver SQT		101		ERV	2	12	2424						
	Dry-fire and maneuver SQT		101		ATV	2	12	2424						
	Dry-fire and maneuver ULT		101		Pickup	10	12	12120						
9	LFAM SQT	5.0	385	5 to 22	MTVR	2	12	9240	None	0	0	0	9 mm	10000
	LFAM SQT		385		Pickup	3	12	13860					Hand Grenades	784
	LFAM SQT		385		ERV	2	12	9240						
	LFAM SQT		385		ATV	2	12	9240						
	LFAM ULT		385		Pickup	10	12	46200						
10	Blank-fire and maneuver SQT	18.0	116	15 to 35	MTVR	2	29	6728	None	0	0	0	LAAW	568
	Blank-fire and maneuver SQT		116		Pickup	3	29	10092						
	Blank-fire and maneuver SQT		116		ERV	2	29	6728						
	Blank-fire and maneuver SQT		116		ATV	2	29	6728						
	Blank-fire and maneuver ULT		116		HMMWV	5	29	16820						
	Blank-fire and maneuver ULT		116		Pickup	5	29	16820						
	Totals		3865											
	USMC Training													
1	Marine Aviation and Weapons Tactics Squadron One Weapons and Tactics Instructors Course, MEU SOC Tactical, Infantry Battalion Training, and MARSOC Tactical Training	336.0	4		HMMWV	45	150	27000	MV22	12	120		5.56 mm (all rounds)	3000000
			4		MTVR	40	350	56000	F/A-18	0	0		60 mm mortar	12000
			4		LVS	5	500	10000	AV-8B	0	0		40 mm TP	60000
			4		ITV	15	50	3000	JSF	0	0		40 mm M203 TP	12000
			4		M1A1 Tank	5	60	1200	KC-130	0	0		7.62 (all rounds)	200000
			4		AAV	15	60	3600	CH-53E	12	120		.50 Cal (all rounds	200000
			4		MRAP	30	150	18000	AH-1	12	120		81mm mortar	12000
			4		FMTV	15	150	9000	UH-1	12	240		9mm	20000
													120mm WP	400
	Totals		32											

(a) Days = the number of days per operation
(b) Operations = the number of operations per year

Alternative 2 Operations and Description

Operation	Type Training	Days (a)	Operations (b)	Aircraft	Number	Total Hours	Emissions Factors (lb/operation) (c) CO	NOx	ROG	SOx	PM10	CO2	CH4	N2O	Emissions (lbs) CO	Nox	ROG	Sox	PM	CO2	CH4	N2O
	NSW Training																					
1	5.56 mm static SQT	4	103	None	0																	
2	7.62 mm static SQT	4	96	None	0																	
3	0.5 caliber static SQT	5	21	None	0																	
4	HELO sniping	5	44	HH60H	72	336.0	7.50	7.68	0.66	0.48	5.04	3859.20	0.11	0.12	2520	2580.48	221.76	161.28	1693.44	1296691	35.8848	40.32
5	Explosive projectiles SQT	5	119	None	0																	
6	Mortar ULT	3.5	11	None	0																	
7	In-place demolitions SQT	5	29	None	0																	
8	Dry-fire and maneuver SQT	6	101	None	0																	
9	LFAM SQT	5	385	None	0																	
10	Blank-fire and maneuver SQT	18	116	None	0																	
	USMC Training																					
1	Marine Aviation and Weapons Tactics Squadron One Weapons and Tactics Instructors Course, MEU SOC Tactical, Infantry Battalion Training, and MARSOC Tactical Training	336		MV22	12	192	0.29	8.87	0.01	0.24	0.94	1899	0.05	0.06	55.68	1703.04	1.92	46.08	180.48	364608	10.1161	11.3664
				F/A-18	0	0	37.8594	104.0432	6.82404	6.21642	98.6214	14568.86	0.41	0.47	0	0	0	0	0	0	0	0
				AV-8B	0	0	69.01	25.45	3.8	1.73	22.86	13443.62	0.38	0.43	0	0	0	0	0	0	0	0
				JSF	0	0	6.5	68.6	1.23	5.09	28.91	1206.279	0.03	0.04	0	0	0	0	0	0	0	0
				KC-130	0	0	9.315	36.72	2.115	1.8	17.865	14026.5	0.3924	0.45045	0	0	0	0	0	0	0	0
				CH-53E	12	192	1.94	4.03	0.52	0.22	1.19	1737.62	0.05	0.05	372.48	773.76	99.84	42.24	228.48	333623	9.22752	10.368
				AH-1	12	48	0.69	0.32	0.03	0.02	0.25	192.18	0.01	0.01	33.12	15.36	1.44	0.96	12	9224.64	0.25632	0.288
				UH-1	12	192	0.13	0.25	0.01	0.02	0.21	157.94	0.00	0.00	24.96	48	1.92	3.84	40.32	30324.48	0.841926	0.945984
											PM10	PM2.5										
	Fugitive Dust Emissions from Pad Landings			MV-22	12	192					8.87	4.43							1703.04			
				CH-53E	12	192					2.53	0.38							485.76			
				AH-1	12	48					0.41	0.06							19.68			
				UH-1	12	192					0.46	0.07							88.32			
										pounds/year					**3006.24**	**5120.64**	**326.88**	**254.4**	**4451.52**	**2034471.4**	**56.326662**	**63.288384**
										tons/year					**1.50312**	**2.56032**	**0.16344**	**0.1272**	**2.22576**	**1017.2357**	**0.0281633**	**0.0316442**

(a) Days = the number of days per operation
(b) Operations = the number of operations per year
(c) Assume 1 Pad Landings per aircraft per hour for rotary wing aircraft; assume cruise for fixed wing aircraft.
Emissions for Mission Operations from AESO
1- hour cruise emissions
AESO Memoranda:

MV-22	9965 Rev B
F/A-18	9815 Rev F
AV-8B	9963 Rev A
JSF	From JSF EIS, 2010
KC-130	2000-10B
CH-53E	
AH-1	
UH-1	

Pad Landing Fugitive Dust emissions from MV-22 EIS for CH-43, UH-1 and AH-1

Alternative 2 Operations and Description

Scenario	Type Training	Reference	Days (a)	Operations (b)	Ground Vehicles	Number	Miles per operation	Total Miles	Miles/hour	Hours	horsepower	Emissions Factors (grams/VMT or g/hp-hr) CO	NOx	ROG	SOx	PM10	PM2.5	CO2	CH4	N2O	Emissions (lbs) CO	Nox	ROG	Sox	PM10	PM2.5	CO2	CH4	N2O
1	5.56 mm static SQT	1	103		ERV	2	0.25	51.5	15	3.433333	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	2.25957372	5.569881	0.387007	0.009848324	0.216193	0.216193	1003.362	0.068671	0.141885
	5.56 mm static ULT	1	103		Pickup	1	0.25	25.75	15	1.716667	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	0.02504478	0.028799	0.00429	0.000340616	0.00354	0.003257	19.63099	0.000199	0.001198
2	7.62 mm static SQT	1	96		ERV	2	0.25	48	15	3.2	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	2.10601046	5.191345	0.360706	0.009179021	0.2015	0.2015	935.1722	0.064004	0.132242
	7.62 mm static ULT	1	96		Pickup	1	0.25	24	15	1.6	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	0.02334271	0.026842	0.003998	0.000317467	0.003299	0.003036	18.29685	0.000186	0.001117
3	0.5 caliber static SQT	1	21		ERV	2	0.25	10.5	15	0.7	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	0.46068979	1.135607	0.078904	0.002007911	0.044078	0.044078	204.5689	0.014001	0.028928
	0.5 caliber static NSW	1	21		Pickup	1	0.25	5.25	15	0.35	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	0.00510622	0.005872	0.000875	6.9446E-05	0.000722	0.000664	4.002436	4.06E-05	0.000244
4	HELO sniping	1	44		None	0	0	0																					
5	Explosive projectiles SQT	1	119		MTVR	2	1.7	404.6	15	26.97333	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	17.7519131	43.75871	3.040447	0.077371496	1.698481	1.698481	7882.722	0.539499	1.114693
		1	119		Pickup	3	1.7	606.9	15	40.46	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	0.59027881	0.678764	0.101105	0.008027955	0.083436	0.076761	462.6816	0.004696	0.028237
		1	119		ERV	2	1.7	404.6	15	26.97333	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	17.7519131	43.75871	3.040447	0.077371496	1.698481	1.698481	7882.722	0.539499	1.114693
	Explosive projectiles ULT	1	119		Pickup	10	1.7	2023	15	134.8667	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	1.96759602	2.262546	0.337017	0.026759849	0.27812	0.25587	1542.272	0.015654	0.094122
6	Mortar ULT	1	11		Pickup	10	2.3	253	15	16.86667	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	0.24607108	0.282958	0.042148	0.003346635	0.034782	0.032	192.8793	0.001958	0.011771
7	In-place demolitions SQT	1	29		MTVR	2	2.3	133.4	15	8.893333	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	5.85295406	14.42761	1.002461	0.025510029	0.560003	0.560003	2598.999	0.177877	0.367524
	In-place demolitions SQT	1	29		Pickup	3	2.3	200.1	15	13.34	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	0.19461985	0.223794	0.033335	0.002646884	0.02751	0.025309	152.55	0.001548	0.00931
	In-place demolitions SQT	1	29		ERV	2	2.3	133.4	15	8.893333	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	5.85295406	14.42761	1.002461	0.025510029	0.560003	0.560003	2598.999	0.177877	0.367524
	In-place demolitions ULT	1	29		Pickup	10	2.3	667	15	44.46667	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	0.64873285	0.74598	0.111117	0.008822946	0.091698	0.084363	508.4999	0.005161	0.031033
8	Dry-fire and maneuver SQT	1	101		MTVR	2	12	2424	15	161.6	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	106.353528	262.1629	18.21563	0.463540552	10.17577	10.17577	47226.19	3.232193	6.678242
	Dry-fire and maneuver SQT	1	101		Pickup	3	12	3636	15	242.4	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	3.53642073	4.066542	0.60573	0.048096298	0.499874	0.459884	2771.973	0.028135	0.169168
	Dry-fire and maneuver SQT	1	101		ERV	2	12	2424	15	161.6	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	106.353528	262.1629	18.21563	0.463540552	10.17577	10.17577	47226.19	3.232193	6.678242
	Dry-fire and maneuver SQT	1	101		ATV	2	12	2424	15	161.6	300	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	79.7651461	196.6222	13.66172	0.347655414	7.631829	7.631829	35419.65	2.424144	5.008682
	Dry-fire and maneuver ULT	1	101		Pickup	10	12	12120	15	808	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	11.7880691	13.55514	2.019101	0.160320995	1.666245	1.532945	9239.909	0.093783	0.563894
9	LFAM SQT	1	385		MTVR	2	12	9240	15	616	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	405.407013	999.3339	69.43582	1.766961509	38.78884	38.78884	180020.6	12.32073	25.45667
	LFAM SQT	1	385		Pickup	3	12	13860	15	924	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	13.4804157	15.50118	2.308972	0.183337375	1.905458	1.753022	10566.43	0.107247	0.644849
	LFAM SQT	1	385		ERV	2	12	9240	15	616	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	405.407013	999.3339	69.43582	1.766961509	38.78884	38.78884	180020.6	12.32073	25.45667
	LFAM SQT	1	385		ATV	2	12	9240	15	616	300	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	304.05526	749.5005	52.07687	1.325221132	29.09163	29.09163	135015.5	9.240551	19.0925
	LFAM ULT	1	385		Pickup	10	12	46200	15	3080	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	44.9347189	51.67059	7.696572	0.611124584	6.351528	5.843406	35221.43	0.357491	2.149497
10	Blank-fire and maneuver SQT	1	116		MTVR	2	29	6728	15	448.5333	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	295.192466	727.6535	50.5589	1.286592752	28.24365	28.24365	131080	8.971201	18.53598
	Blank-fire and maneuver SQT	1	116		Pickup	3	29	10092	15	672.8	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	9.81561001	11.287	1.681251	0.133495007	1.387438	1.276443	7693.825	0.078091	0.469539
	Blank-fire and maneuver SQT	1	116		ERV	2	29	6728	15	448.5333	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	295.192466	727.6535	50.5589	1.286592752	28.24365	28.24365	131080	8.971201	18.53598
	Blank-fire and maneuver SQT	1	116		ATV	2	29	6728	15	448.5333	300	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	221.394349	545.7402	37.91917	0.964944564	21.18273	21.18273	98309.97	6.728401	13.90198
	Blank-fire and maneuver ULT	1	116		HMMWV	5	29	16820	15	1121.333	192	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	354.230959	873.1843	60.67068	1.543911303	33.89237	33.89237	157296	10.76544	22.24318
	Blank-fire and maneuver ULT	1	116		Pickup	5	29	16820	15	1121.333	360	0.441168	0.5073	0.075565	0.006	0.062359	0.05737	345.8028	0.00351	0.021104	16.35935	18.81167	2.802085	0.222491678	2.312396	2.127405	12823.04	0.130152	0.782566
	Totals			###																	2729.00311	6590.765	467.4092	12.85191808	265.8399	264.6682	1247019	80.61256	169.8122
1	Marine Aviation and Weapons T	1	4		HMMWV	45	150	27000	15	1800	360	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	1066.16779	2628.118	182.6072	4.646879293	102.0096	102.0096	473430.9	32.40193	66.94773
			4		MTVR	40	350	56000	15	3733.333	360	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	2211.31098	5450.912	378.7408	9.637971868	211.5755	211.5755	981930.8	67.20401	138.8545
			4		LVS	5	500	10000	15	666.6667	192	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	210.601046	519.1345	36.07056	0.917902083	20.15004	20.15004	93517.22	6.400381	13.22424
			4		ITV	15	50	3000	15	200	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	131.625654	324.4591	22.5441	0.573688802	12.59378	12.59378	58448.26	4.000238	8.265151
			4		M1A1 Tank	5	60	1200	15	80	445	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	58.5734158	144.3843	10.03212	0.255291517	5.604231	5.604231	26009.48	1.780106	3.677992
			4		AAV	15	60	3600	15	240	150	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	59.2315441	146.0066	10.14484	0.258159961	5.6672	5.6672	26301.72	1.800107	3.719318
			4		MRAP	30	150	18000	15	1200	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	789.753921	1946.754	135.2646	3.44213281	75.56267	75.56267	350689.6	24.00143	49.59091
			4		FMTV	15	150	9000	15	600	400	1.96395	4.841164	0.336374	0.00856	0.187908	0.187908	872.0903	0.059686	0.123322	394.876961	973.3772	67.63229	1.721066405	37.78133	37.78133	175344.8	12.00072	24.79545
																				Total	4922.14131	12133.15	843.0365	21.45309274	470.9443	470.9443	2185673	149.5889	309.0753
																				Total, tons/year	3.82557221	9.361956	0.655223	0.017152505	0.368392	0.367806	1716.346	0.115101	0.239444

Days = the number of days per operation
Operations = the number of operations per year

NOTES ERV modeled as off road truck
MTVR and EVR modeled as 400 hp off road truck
Pickup modeled as MDV, diesel
ATV modeled as 300 horsepower off road truck
HMMWV modeled as 192 horsepower off road truck
Emission factors from ARB OFFROAD model

Table 4 Ordnance Emissions Alternative 2

Alternative 2 Operations and Description

Scenario	Type Training	Reference	Days (a)	Operations (b)	Ordnance	Number	CO	NOX	ROG	SOX	PM10	PM2.5	Lead	CO2	CH4	Emissions, lbs/year								
							lbs/item	lbs/item	lbs/item	lbs/item	lbs/item	lbs/item	lbs/item	lbs/item	lbs/item	Total CO	Total NOx	Total ROG	Total SOx	Total PM10	Total PM2.5	Total Lead	Total CO2	Total CH4
1	5.56 mm static SQT	4		103	5.56 mm rounds	2803306	1.60E-03	8.50E-05			3.90E-05	2.80E-05	5.10E-06	8.70E-04	9.70E-06	2.24E+00	1.19E-01	0.00E+00	0.00E+00	5.47E-02	3.92E-02	7.15E-03	1.22E+00	1.36E-02
	5.56 mm static ULT			103																				
2	7.62 mm static SQT	4		96	7.62 mm rounds	2788370	2.30E-03	9.70E-05			5.10E-05	3.80E-05	4.90E-06	1.20E-03	1.00E-05	3.21E+00	1.35E-01	0.00E+00	0.00E+00	7.11E-02	5.30E-02	6.83E-03	1.67E+00	1.39E-02
	7.62 mm static ULT			96																				
3	0.5 caliber static SQT	5		21	0.5 caliber	94944	1.10E-02	1.20E-03			3.10E-04	1.90E-04	1.30E-05	5.10E-03	1.30E-04	5.22E-01	5.70E-02	0.00E+00	0.00E+00	1.47E-02	9.02E-03	6.17E-04	2.42E-01	6.17E-03
	0.5 caliber static NSW			21																				
4	HELO sniping	5		44																				
5	Explosive projectiles SQT	5		119	40 mm and TP grenades	23992	2.60E-03	9.70E-05			1.40E-04	1.20E-04	1.10E-03	2.70E-03	5.40E-06	3.12E-02	1.16E-03	0.00E+00	0.00E+00	1.68E-03	1.44E-03	1.32E-02	3.24E-02	6.48E-05
					84 mm M3 Karl Gustav	1162	1.90E-01	4.80E-03			1.20E-02	1.00E-02	1.70E-05	1.90E-01	5.60E-04	1.10E-01	2.79E-03	0.00E+00	0.00E+00	6.97E-03	5.81E-03	9.88E-06	1.10E-01	3.25E-04
	Explosive projectiles ULT			119																				
6	Mortar ULT	3.5		11	60 mm Mortar	2187	5.70E-05	5.70E-04			1.70E-02	1.50E-02	3.20E-05	3.20E-03		6.23E-05	6.23E-04	0.00E+00	0.00E+00	1.86E-02	1.64E-02	3.50E-05	3.50E-03	0.00E+00
7	In-place demolitions SQT	5		29	Anti-Personnel Mines	360	2.00E-02	1.80E-02		9.10E-05	4.90E-02	2.60E-02	5.70E-05	1.60E+00	3.80E-04	3.60E-03	3.24E-03	0.00E+00	1.64E-05	8.82E-03	4.68E-03	1.03E-05	2.88E-01	6.84E-05
	In-place demolitions SQT			29	Demolition Blocks/shaped charg	1080	1.20E-02	3.25E-02		1.00E-04	6.25E-02	3.50E-02	5.00E-04	3.00E+00		6.48E-03	1.76E-02	0.00E+00	5.40E-05	3.38E-02	1.89E-02	2.70E-04	1.62E+00	0.00E+00
	In-place demolitions SQT			29	Demolition Blocks/shaped charg	72	3.15E-01	3.45E-01			1.75E+00	7.00E-01	1.85E-01	6.50E+01		1.13E-02	1.24E-02	0.00E+00	0.00E+00	6.30E-02	2.52E-02	6.66E-03	2.34E+00	0.00E+00
	In-place demolitions ULT			29	Detonating cord	54000	1.10E-03	2.60E-04			2.80E-03	2.00E-03	1.50E-05	5.70E-03	1.80E-05	2.97E-02	7.02E-03	0.00E+00	0.00E+00	7.56E-02	5.40E-02	4.05E-04	1.54E-01	4.86E-04
8	Dry-fire and maneuver SQT	6		101	Smokes, flares, etc.	38820	7.50E-03	2.50E-03	2.40E-04	7.10E-05	5.00E-02	5.00E-02	3.80E-06	1.80E-01		1.46E-01	4.85E-02	4.66E-03	1.38E-03	9.71E-01	9.71E-01	7.38E-05	3.49E+00	0.00E+00
	Dry-fire and maneuver SQT			101																				
	Dry-fire and maneuver SQT			101																				
	Dry-fire and maneuver SQT			101																				
	Dry-fire and maneuver ULT			101																				
9	LFAM SQT	5		385	9 mm	10000	3.10E-04	1.50E-05		8.20E-07	2.40E-05	2.00E-05	6.80E-06	2.00E-04	1.40E-06	1.55E-03	7.50E-05	0.00E+00	4.10E-06	1.20E-04	1.00E-04	3.40E-05	1.00E-03	7.00E-06
	LFAM SQT			385	Hand Grenades	784	1.10E-05	4.00E-05	3.20E-07		1.10E-04	9.40E-05		1.70E-04		4.31E-06	1.57E-05	1.25E-07	0.00E+00	4.31E-05	3.68E-05	0.00E+00	6.66E-05	0.00E+00
	LFAM SQT			385																				
	LFAM SQT			385																				
	LFAM ULT			385																				
10	Blank-fire and maneuver SQT	18		116	LAAW	568	4.30E-05	2.50E-03	7.30E-06	7.60E-05	1.40E-02	1.30E-02		1.10E-02		1.22E-05	7.10E-04	2.07E-06	2.16E-05	3.98E-03	3.69E-03	0.00E+00	3.12E-03	0.00E+00
	Blank-fire and maneuver SQT			116																				
	Blank-fire and maneuver SQT			116																				
	Blank-fire and maneuver SQT			116																				
	Blank-fire and maneuver ULT			116																				
	Blank-fire and maneuver ULT			116																				
	Totals			3865											lbs/year	6.31E+00	4.05E-01	4.66E-03	1.47E-03	1.32E+00	1.20E+00	3.53E-02	1.12E+01	3.47E-02
															Subtotal, tons/year	3.16E-03	2.03E-04	2.33E-06	7.37E-07	6.62E-04	6.01E-04	1.76E-05	5.59E-03	1.73E-05
1	Marine Aviation and Weapons Tactics Squadron One Weapons and Tactics Instructors Course, MEU SOC Tactical, Infantry Battalion Training, and MARSOC Tactical Training	336		4																				
					5.56 mm (all rounds)	3000000	1.60E-03	8.50E-05			3.90E-05	2.80E-05	5.10E-06	8.70E-04	9.70E-06	2.40E+00	1.28E-01	0.00E+00	0.00E+00	5.85E-02	4.20E-02	7.65E-03	1.31E+00	1.46E-02
				4	60 mm mortar	12000	5.70E-05	5.70E-04			1.70E-02	1.50E-02	3.20E-05	3.20E-03		3.42E-04	3.42E-03	0.00E+00	0.00E+00	1.02E-01	9.00E-02	1.92E-04	1.92E-02	0.00E+00
				4	40 mm TP	60000	2.60E-03	9.70E-05			1.40E-04	1.20E-04	1.10E-03	2.70E-03	5.40E-06	7.80E-02	2.91E-03	0.00E+00	0.00E+00	4.20E-03	3.60E-03	3.30E-02	8.10E-02	1.62E-04
				4	40 mm M203 TP	12000	2.60E-03	9.70E-05			1.40E-04	1.20E-04	1.10E-03	2.70E-03	5.40E-06	1.56E-02	5.82E-04	0.00E+00	0.00E+00	8.40E-04	7.20E-04	6.60E-03	1.62E-02	3.24E-05
				4	7.62 (all rounds)	200000	2.30E-03	9.70E-05			5.10E-05	3.80E-05	4.90E-06	1.20E-03	1.00E-05	2.30E-01	9.70E-03	0.00E+00	0.00E+00	5.10E-03	3.80E-03	4.90E-04	1.20E-01	1.00E-03
				4	.50 Cal (all rounds	200000	1.10E-02	1.20E-03			3.10E-04	1.90E-04	1.30E-05	5.10E-03	1.30E-04	1.10E+00	1.20E-01	0.00E+00	0.00E+00	3.10E-02	1.90E-02	1.30E-03	5.10E-01	1.30E-02
				4	81mm mortar	12000	9.70E-02	1.60E-02			1.70E-01	9.30E-02	6.90E-04	1.40E+00	1.50E-03	5.82E-01	9.60E-02	0.00E+00	0.00E+00	1.02E+00	5.58E-01	4.14E-03	8.40E+00	9.00E-03
				4	9mm	20000	3.1E-04	1.5E-05		8.2E-08	2.4E-05	2.0E-05		2.0E-04	1.4E-06	3.10E-03	1.50E-04	0.00E+00	8.20E-07	2.40E-04	2.00E-04	0.00E+00	2.00E-03	1.40E-05
															lbs/year	4.41E+00	3.60E-01	0.00E+00	8.20E-07	1.22E+00	7.17E-01	5.34E-02	1.05E+01	3.78E-02
															Subtotal, tons/year	2.20E-03	1.80E-04	0.00E+00	4.10E-10	6.11E-04	3.59E-04	2.67E-05	5.23E-03	1.89E-05
															Total, tons/year	5.36E-03	3.83E-04	2.33E-06	7.37E-07	1.27E-03	9.60E-04	4.43E-05	1.08E-02	3.62E-05

umber of days per operation
e number of operations per year

NOTES Emission factors from AP-42, Chapter 15.
5.56-mm rounds from M-855 5.56 mm ball cartridge
7.62-mm rounds from M-80 7.62 mm ball cartridge
0.5 caliber from A557 M33 ball and M17 tracer cartridge
40 mm and TP grenades assumed to be M918 40 mm practice cartridges
Hand Grenades from M228 Practice Hand Grenade
84 mm M3 assumed to be M301A3
9 mm assumed to be M882 ball cartridge
60 mm assumed to be 60 mm full range practice cartridge
Anti-personnel mines assumed to be M18A1 antipersonnel mine
LAAW assumed to be M22 Anti-tank guided missile and rocket simulator
Demolition blocks/shaped charges 2.5 lbs NEW max assumed to be 1 lb blocks
Demolition blocks/shaped charges 50 lbs NEW max assumed to be 15 lb blocks
Detonating cord assumed to be M732 Proximity Fuse
Smoke, flare, etc assumed to be M159 White Star Cluster Signal Flare

Vehicle mileage data provided by NSW and USMC.

Total Vehicle Miles: Existing Activity

Table 1. Annual Miles Driven by NSW Vehicles in Support of EXISTING NSW Training Activities

Training Activity Type	# Training Events per Year Using Vehicles	Vehicle Type	# of Vehicles (by type)	Miles per vehicle	Total Annual Miles per Vehicle Type (per training	Vehicle Weight (lbs)[1]	Vehicle weight (tons)	PM10 emissions per mile (lb/VMT)[2]	Annual PM10 emissions (tons/year)
SQT 5.56mm Static	36	ERV	2	0.25	50	6,000	3.0	1.10	0.02
ULT 5.56mm Static	63	Pickup	1	0.25	25	5,250	2.6	1.04	0.01
SQT 7.62mm Static	18	ERV	2	0.25	45	6,000	3.0	1.10	0.02
ULT 7.62mm Static	72	Pickup	1	0.25	23	5,250	2.6	1.04	0.01
SQT .50 cal Static	6	ERV	2	0.25	11	6,000	3.0	1.10	0.00
NSWC N4 .50 cal Weapons	15	Pickup	1	0.25	5	5,250	2.6	1.04	0.00
SQT Explosive Projectiles	6	MTVR	2	1.7	65	27,900	14.0	2.20	0.06
	6	Pickup	3	1.7	97	5,250	2.6	1.04	0.04
	6	ERV	2	1.7	65	6,000	3.0	1.10	0.03
ULT Explosive Projectiles	97	Pickup	10	1.7	323	5,250	2.6	1.04	0.14
ULT Mortar	9	Pickup	10	2.3	207	5,250	2.6	1.04	0.09
SQT In-place Demolitions	18	MTVR	2	2.3	124	27,900	14.0	2.20	0.11
	18	Pickup	3	2.3	186	5,250	2.6	1.04	0.08
	18	ERV	2	2.3	124	6,000	3.0	1.10	0.06
ULT In-Place Demolitions	9	Pickup	10	2.3	621	5,250	2.6	1.04	0.27
SQT Dry-Fire & Maneuver	24	MTVR	2	12	2,088	27,900	14.0	2.20	1.89
	24	Pickup	3	12	3,132	5,250	2.6	1.04	1.34
	24	ERV	2	12	2,088	6,000	3.0	1.10	0.95
	24	ATV	2	12	2,088	650	0.3	0.40	0.35
ULT Dry-Fire & Maneuver	63	Pickup	10	12	10,440	5,250	2.6	1.04	4.46
SQT Live-Fire & Maneuver	120	MTVR	2	12	7,632	27,900	14.0	2.20	6.91
	120	Pickup	3	12	11,448	5,250	2.6	1.04	4.89
	120	ERV	2	12	7,632	6,000	3.0	1.10	3.46
	120	ATV	2	12	7,632	650	0.3	0.40	1.27
ULT Live-Fire & Maneuver	192	Pickup	10	12	38,160	5,250	2.6	1.04	16.30
SQT Blank-Fire & Maneuver	24	MTVR	2	29	2,436	27,900	14.0	2.20	2.21
	24	Pickup	3	29	3,654	5,250	2.6	1.04	1.56
	24	ERV	2	29	2,436	6,000	3.0	1.10	1.11
	24	ATV	2	29	2,436	650	0.3	0.40	0.41
ULT Blank-Fire & Maneuver	40	HMMWV	5	29	6,090	7,230	3.6	1.20	3.00
	40	Pickup	5	29	6,090	5,250	2.6	1.04	2.60
								Total Annual PM10 Emissions	**53.65**

Table 2. Annual Miles Driven by USMC Vehicles in Support of EXISTING USMC Training Activities - Alternative 2

Training Activity Type	# of Training Events per Year	Vehicle Type	# of Vehicles (by type)	Miles per vehicle	Total Annual Miles per Vehicle Type (per training	Vehicle Weight (lbs)	Vehicle weight (tons)	PM10 emissions per mile (lb/VMT)[2]	Annual PM10 emissions (tons/year)
TALONEX/WTI	2	HMMWV	15	160	4,800	7,230	3.6	1.20	2.37
TALONEX/WTI	2	MTVR	20	96	3,840	27,900	14.0	2.20	3.48
								Total Annual PM10 Emissions	**5.85**
								Total Annual PM10 Emissions - Baseline	**59.50**

Total Vehicle Miles: Proposed Activity

Table 3. Annual Miles Driven by NSW Vehicles in Support of PROPOSED NSW Training Activities - Alternative 2

Training Activity Type	# Training Events per Year Using Vehicles	Vehicle Type	# of Vehicles (by type)	Miles per vehicle	Total Annual Miles per Vehicle Type (per training	Vehicle Weight (lbs)	Vehicle weight (tons)	PM10 emissions per mile (lb/VMT)[2]	Annual PM10 emissions (tons/year)
SQT 5.56mm Static	36	ERV	2	0.25	52	6,000	3.0	1.10	0.02
ULT 5.56mm Static	67	Pickup	1	0.25	26	5,250	2.6	1.04	0.01
SQT 7.62mm Static	18	ERV	2	0.25	48	6,000	3.0	1.10	0.02
ULT 7.62mm Static	72	Pickup	1	0.25	24	5,250	2.6	1.04	0.01
SQT .50 cal Static	6	ERV	2	0.25	11	6,000	3.0	1.10	0.00
NSWC N4 .50 cal Weapons	15	Pickup	1	0.25	5	5,250	2.6	1.04	0.00
SQT Explosive Projectiles	6	MTVR	2	1.7	405	27,900	14.0	2.20	0.37
	6	Pickup	3	1.7	607	5,250	2.6	1.04	0.26
	6	ERV	2	1.7	405	6,000	3.0	1.10	0.18
ULT Explosive Projectiles	113	Pickup	10	1.7	2,023	5,250	2.6	1.04	0.86
ULT Mortar	11	Pickup	10	2.3	253	5,250	2.6	1.04	0.11
SQT In-place Demolitions	18	MTVR	2	2.3	133	27,900	14.0	2.20	0.12
	18	Pickup	3	2.3	200	5,250	2.6	1.04	0.09
	18	ERV	2	2.3	133	6,000	3.0	1.10	0.06
ULT In-Place Demolitions	11	Pickup	10	2.3	667	5,250	2.6	1.04	0.28
SQT Dry-Fire & Maneuver	24	MTVR	2	12	2,424	27,900	14.0	2.20	2.20
	24	Pickup	3	12	3,636	5,250	2.6	1.04	1.55
	24	ERV	2	12	2,424	6,000	3.0	1.10	1.10
	24	ATV	2	12	2,424	650	0.3	0.40	0.40
ULT Dry-Fire & Maneuver	67	Pickup	10	12	12,120	5,250	2.6	1.04	5.18
SQT Live-Fire & Maneuver	120	MTVR	2	12	9,240	27,900	14.0	2.20	8.37
	120	Pickup	3	12	13,860	5,250	2.6	1.04	5.92
	120	ERV	2	12	9,240	6,000	3.0	1.10	4.19
	120	ATV	2	12	9,240	650	0.3	0.40	1.54
ULT Live-Fire & Maneuver	259	Pickup	10	12	46,200	5,250	2.6	1.04	19.74
SQT Blank-Fire & Maneuver	24	MTVR	2	29	6,728	27,900	14.0	2.20	6.09
	24	Pickup	3	29	10,092	5,250	2.6	1.04	4.31
	24	ERV	2	29	6,728	6,000	3.0	1.10	3.05
	24	ATV	2	29	6,728	650	0.3	0.40	1.12
ULT Blank-Fire & Maneuver	22	HMMWV	5	29	16,820	7,230	3.6	1.20	8.30
	22	Pickup	5	29	16,820	5,250	2.6	1.04	7.19
								Total Annual PM10 Emissions	**82.67**

Table 4. Annual Miles Driven by USMC Vehicles in Support of PROPOSED USMC Training Activities - Alternative 2

Training Activity Type	# of Training Events per Year	Vehicle Type	# of Vehicles (by type)	Miles per vehicle	Total Annual Miles per Vehicle Type (per training	Vehicle Weight (lbs)	Vehicle weight (tons)	PM10 emissions per mile (lb/VMT)[2]	Annual PM10 emissions (tons/year)
TALONEX/WTI	2	LVS	2	30	120	40,300	20.2	2.59	0.13
TALONEX/WTI	2	ITV/EFSS	6	12	144	3,900	2.0	0.91	0.05
TALONEX/WTI	2	M1A1 TANK	NA	0	0	126,000	63.0	4.33	0.00
TALONEX/WTI	2	AAV	NA	0	0	58,200	29.1	3.06	0.00
TALONEX/WTI	2	MRAP	NA	0	0	32,000	16.0	2.34	0.00
TALONEX/WTI	2	FMTV/HIM ARS	12	32	768	24,000	12.0	2.05	0.65
TALONEX/WTI	2	4x4 TRUCK	8	128	2,048	5,250	2.6	1.04	0.87
								Total Annual PM10 Emissions	**1.71**

Total Annual PM10 Emissions from NSW and USMC Vehicles- Proposed Action[3]	**62.22**
Delta (Annual Emissions due to the Proposed Action only)	**2.73**

Notes:

[1]Representative vehicles used to determine weights:

ERV: F-250, 6,000 lb curb weight
Pickup truck: 5,250 lb (2.6 tons) gross vehicle weight (e.g., Toyota Tundra)
MTVR: Oshkosh MK23 Cargo, 27,900 lb curb weight
ATV: Yamaha Grizzy 4x4, 650 lb "wet" weight
HMMWV :M1165A1, 7,230 lb curb weight
LVS: MK48/14, 40,300 lb curb weight
ITV/EFSS: General Dynamics Prime Mover, 3900 lb vehicle weight
M1A1: 63 short tons (126,000 lb)
AAV: 29.1 tons (58,200 lb)
MRAP: Cougar, 32,000 lb curb weight
FMTV/HIM ARS: M142, 24,000 lb

[2]Formula for PM10 emissions:

E=1.5(silt content/12)^0.9 * (vehicle weight/3)^0.45

Assumes average silt content is 8.5%.

[3]Fugitive Dust controls:

Baseline: All miles are assumed to be driven on un-paved, dirt roads with no dust minimization measures in use.

Alt 2: Assume that 75% of vehicle miles under Alternative 2 are on road (25% off-road), and 50% of the on-road miles are on major roads treated with a dust palliative as needed, 70% control efficiency

Summary of Annual Operational Emissions - Alternative 2

Total Annual Operational Emissions Resulting from Implementation of Alternative 2									
Emissions (tons/year)									
CO	NOx	ROG	SOx	PM10	PM2.5	CO2	CH4	N2O	CO2e (metric tons)
5.33	11.92	0.82	0.14	64.82	0.37	2,733.59	0.14	0.27	2,556

Annual Operational Emissions Resulting from Implementation of Alternative 2 in Imperial County									
Emissions (tons/year)									
CO	NOx	ROG	SOx	PM10	PM2.5	CO2	CH4	N2O	CO2e (metric tons)
3.47	7.75	0.53	0.09	42.13	0.24	1,776.83	0.09	0.18	1,661.40

Annual Operational Emissions Resulting from Implementation of Alternative 2 in Riverside County									
Emissions (tons/year)									
CO	NOx	ROG	SOx	PM10	PM2.5	CO2	CH4	N2O	CO2e (metric tons)
1.87	4.17	0.29	0.05	22.69	0.13	956.76	0.05	0.09	894.60

Alternative 2:
Assumes average silt content is 8.5%.
Applicable *de minimis* level for the project area (Salton Sea Air Basin - Riverside and Imperial Counties):
70 tons/year for PM10 (serious nonattainment area)
Estimated number of miles based on amount of training expected to occur in Imperial County.
It was assumed that 65 percent of the operational emissions would occur within Imperial County, and 35 percent would occur within Ri

Source:
USEPA. 2006. Compilation of Air Pollutant Emission Factors (AP 42), Fifth Edition, Volume I,

APPENDIX H
RECORD OF NON-APPLICABILITY

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

This Proposed Action falls under the Record of Non-Applicability (RONA) category and is documented with this RONA.

The United States 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 CFR Parts 6, 51, and 93). The United States (U.S.) Navy published *Clean Air Act Conformity Guidance* in Appendix F, OPNAVINST 5090.1C, dated 30 October 2007. These publications provide implementing guidance to document Clean Air Act 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 51.850[a]).

Federal actions may be exempt from conformity determinations if they do not exceed designated *de minimis* levels for criteria pollutants (40 CFR Part 51.853[b]). *De minimis* levels (in tons/year) for the air basin potentially affected by the Proposed Action are listed in Table 1.

Table 1. *De minimis* Levels for Criteria Pollutants in the Salton Sea Air Basin

Criteria Pollutant	*De Minimis* Threshold (tons/year)
Imperial County	
PM_{10}	70
$PM_{2.5}$	100
NO_x	100
VOC	100
Riverside County	
PM_{10}	70
$PM_{2.5}$	100
NO_x	25
VOC	25

PROPOSED ACTION

Action Proponent: U.S. Marine Corps

Location: Chocolate Mountain Aerial Gunnery Range

Proposed Action Name: Proposed Range Redesign of Special Warfare Training Areas 4 and 5

Proposed Action and Emissions Summary: The project is located in Special Warfare Training Areas (SWATs) 4 and 5, within the western portion of the Chocolate Mountain Aerial Gunnery Range (CMAGR). SWAT 4 is located within Imperial and Riverside counties and SWAT 5 is located within Riverside County.

The Proposed Action consists of: (1) a reconfiguration and certification of static ranges and live-fire and maneuver (LFAM) areas and improving supporting range infrastructure, and (2) an increase in the annual throughput of personnel and training events within SWATs 4 and 5 within the CMAGR. There would be no change to the existing SWATs 4 and 5 boundaries under the Proposed Action.

The purpose of the Proposed Action is to increase training throughput and maximize range use capabilities within SWATs 4 and 5 at the CMAGR. The Proposed Action is needed because the existing ranges and supporting infrastructure within SWATs 4 and 5 do not provide sufficient throughput capacity, the ability for multiple units to conduct simultaneous training, or the flexibility to meet evolving operational requirements. Implementation of the Proposed Action would facilitate maintaining Naval Special Warfare, USMC, and other forces at an optimal state of readiness to support current and emerging contingency and wartime requirements.

Air Emissions Summary: The Proposed Action would result in air emissions from construction activities and training activities. The three construction phases are estimated to last a total of 24 months, and each phase includes grading activities. Construction activities would occur within Imperial County only. The annual emissions from construction are shown in Table 2, and annual emissions from operational activities are shown in Table 3.

Table 2. Estimated Total Annual Construction Emissions

Activity and Location	**Air Pollutant Emissions (tons)**					
	VOCs	**CO**	**NO_x**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Imperial County:						
Construction Emissions	2.09	11.89	18.23	0.01	58.71	40.57
Conformity *de minimis* thresholds:	100	NA	100	NA	70	100
Exceeds Conformity *de minimis* threshold?	**No**	**NA**	**No**	**NA**	**No**	**No**

Note: NA = not applicable because the SSAB is currently in attainment of the NAAQS for these criteria pollutants.

Table 3. Total Annual Operational Emissions Resulting from Implementation of the Proposed Action

Activity and Location	Air Pollutant Emissions (tons/year)					
	VOCs	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$
Imperial County:						
Baseline (No-Action Alternative) Emissions	0.16	1.34	2.09	0.05	39.28	0.05
Proposed Action Annual Operational Emissions	0.53	3.47	7.75	0.09	37.33	0.24
Net Change in Emissions	**0.37**	**2.13**	**5.66**	**0.04**	**-1.95**	**0.19**
Conformity *de minimis* thresholds:	100	NA	100	NA	70	100
Exceeds Conformity *de minimis* threshold?	**No**	**NA**	**No**	**NA**	**No**	**No**
Riverside County:						
Baseline (No-Action Alternative) Emissions	0.09	0.72	1.13	0.03	21.15	0.03
Proposed Action Annual Operational Emissions	0.29	1.87	4.17	0.05	20.10	0.13
Net Change in Emissions	**0.2**	**1.15**	**3.04**	**0.02**	**-1.05**	**0.1**
Conformity *de minimis* thresholds:	25	NA	25	NA	70	100
Exceeds Conformity *de minimis* threshold?	**No**	**NA**	**No**	**NA**	**No**	**No**

Notes: NA = not applicable because the SSAB is currently in attainment of the NAAQS for these criteria pollutants.

For the first two years of the project, construction and training emissions would occur simultaneously. The combined emissions from the construction and training phases are shown in Table 4.

Table 4. Total Annual Emissions Resulting from Implementation of the Proposed Action During Construction (from Construction and Training)

Activity and Location	Air Pollutant Emissions (tons/year)					
	VOCs	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$
Imperial County:						
Annual Construction Emissions	2.09	11.89	18.23	0.01	58.71	40.57
Annual Training Emissions (net change)	0.37	2.13	5.66	0.04	-1.95	0.19
Total	**2.46**	**14.02**	**23.89**	**0.05**	**56.76**	**40.76**
Conformity *de minimis* thresholds:	100	NA	100	NA	70	100
Exceeds Conformity *de minimis* threshold?	**No**	**NA**	**No**	**NA**	**No**	**No**
Riverside County:						
Annual Construction Emissions	0	0	0	0	0	0
Annual Training Emissions (net change)	0.2	1.15	3.04	0.02	-1.05	0.1
Total	**0.2**	**1.15**	**3.04**	**0.02**	**-1.05**	**0.1**
Conformity *de minimis* thresholds:	25	NA	25	NA	70	100
Exceeds Conformity *de minimis* threshold?	**No**	**NA**	**No**	**NA**	**No**	**No**

Notes: NA = not applicable because the SSAB is currently in attainment of the NAAQS for these criteria pollutants.

Based on the air quality analysis for the Proposed Action, the maximum net increase in emissions when compared with baseline conditions would be below conformity *de minimis* levels (Tables 2 through 4).

EMISSIONS EVALUATION AND CONCLUSION

The Navy concludes that *de minimis* thresholds for applicable criteria pollutants would not be exceeded as a result of implementation of the Proposed Action. The emissions data supporting that conclusion is shown in Tables 2, 3, and 4 above, which is a summary of the calculations, methodology, data, and references included in the attachment to the RONA. Therefore, the Navy concludes that further formal Conformity Determination procedures are not required, resulting in this Record of Non-Applicability.

RONA APPROVAL

Date:_____

Signature:_____