Naval Facilities Engineering Systems Command Southwest
BRAC PMO West
San Diego, CA

Final
Proposed Plan for Soil Remedial Action
Installation Restoration Program Site 1

Former Marine Corps Air Station El Toro
Irvine, CA

February 2023

Approved for public release: distribution unlimited.

DCN: USAE-1812-4021-0079

This page intentionally left blank

Naval Facilities Engineering Systems Command Southwest
BRAC PMO West
San Diego, CA

Final
Proposed Plan for Soil Remedial Action
Installation Restoration Program Site 1

Former Marine Corps Air Station El Toro
Irvine, CA

February 2023

DCN: USAE-1812-4021-0079

Prepared for:
U.S. Department of the Navy
Naval Facilities Engineering Systems Command Southwest
BRAC PMO West
33000 Nixie Way, Bldg. 50, Suite 207, San Diego, CA 92147

Prepared by:

AECOM 999 Town and Country Road Orange, California 92868	For	USA Environmental, Inc. 720 Brooker Creek Boulevard, Suite 204 Oldsmar, FL 34677

Contract No. N62742-17-D-1812, Task Order No. N6247322F4021

This page intentionally left blank

FINAL PROPOSED PLAN
For Soil Remedial Action
Installation Restoration Program Site 1
Former Marine Corps Air Station El Toro
Irvine, California

February 2023

NAVY PROPOSES FINAL SOIL REMEDIES FOR INSTALLATION RESTORATION PROGRAM SITE 1

The United States (U.S.) Department of the Navy (Navy) requests public comment on this ***Proposed Plan**** for the cleanup of soil impacted by naphthalene and ***munitions and explosives of concern (MEC)*** at ***Installation Restoration Program (IRP)*** Site 1 (the Explosive Ordnance Disposal [EOD] Training Range and the Adjacent Property), located at Former Marine Corps Air Station (MCAS) El Toro, Irvine, California. The U.S. Environmental Protection Agency, Region 9 (U.S. EPA), the California Department of Toxic Substances Control (DTSC), and the California Regional Water Quality Control Board, Santa Ana Region (RWQCB), in cooperation with the Navy, developed and evaluated alternatives including the ***preferred alternatives***.

PREFERRED ALTERNATIVES

This *Proposed Plan* presents the following *preferred alternatives* for cleanup of naphthalene- and *MEC*-impacted soil associated with the EOD Training Range and the Adjacent Property:

- Alternative N-3, Excavation and Off-Site Disposal of naphthalene-impacted soil at the EOD Training Range.
- Alternative M-2, ***Institutional Controls (ICs)*** and Access Restrictions for *MEC*-impacted soil at the EOD Training Range.
- Alternative AP-3, *MEC* Survey of Six Remaining Acres at Area A and Area B(RA) at the Adjacent Property and *ICs*.

The remedy for impacted groundwater at *IRP* Site 1 was selected in the 2012 Final *IRP* Sites 1 and 2 Groundwater ***Record of Decision (ROD)***.

PROPOSED PLAN CONTENT/OVERVIEW

This *Proposed Plan* summarizes the regulatory framework that governs the cleanup; reviews environmental investigations, risk assessments, and remedial alternatives developed and evaluated for soil; and presents the *preferred alternatives*. The Navy will review public comments on this *Proposed Plan* and will provide responses in the *ROD* for soil at *IRP* Site 1.

-NOTICE-
Public Comment Period
March 7 – April 6, 2023

REGULATORY FRAMEWORK

MCAS El Toro was closed on 2 July 1999 as a part of the Base Realignment and Closure (BRAC) Act. Since the late 1980s, numerous investigations have been conducted at Former MCAS El Toro under the Navy's *IRP*, which is a comprehensive environmental investigation and cleanup program that identifies, investigates, and remediates chemical releases to the environment resulting from past military activities. The *IRP* complies with the ***Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)***; the ***Resource Conservation and Recovery Act (RCRA)***; the ***National Oil and Hazardous Substances Pollution Contingency Plan (NCP)***; and all other federal and state laws that govern environmental cleanups. To facilitate resolution of the differing positions regarding the applicability of *RCRA* requirements, the Navy and DTSC agreed that the substantive provisions of the State's *RCRA* closure and post-closure requirements would be incorporated into the *CERCLA*-related documentation for *IRP* Site 1.

The Former MCAS El Toro BRAC Cleanup Team (BCT), which includes representatives from the U.S. EPA, DTSC, and RWQCB, has carefully evaluated environmental data, technical information, and remedial alternatives for the EOD Training Range and the Adjacent Property and concurs with the Navy's *preferred alternatives*.

Public Meeting
Date — March 8, 2023
Irvine Civic Center, Room L-102
1 Civic Center Plaza
Irvine, California
7:00 to 8:00 p.m.

* Words in bold and italic type are defined in the Glossary of Terms on page 14.

DCN: USAE-1812-4021-0079

The Navy, which is the lead agency for making decisions on remedies for the site, is issuing this *Proposed Plan* as part of its public participation responsibilities under Section 117(a) of *CERCLA* and Sections 300.430(f)(2) and (3) of the *NCP*. This *Proposed Plan* summarizes information detailed in documents contained in the ***Administrative Record (AR) File*** for *IRP* Site 1, including the Final ***Remedial Investigation*** (***RI***) and the Final ***Feasibility Study*** (***FS***). The Navy encourages the public to review these documents to gain an understanding of the environmental investigations and cleanups that have been conducted. Documents are available for public review at the locations listed on page 13.

BACKGROUND AND OVERVIEW

SITE DESCRIPTION

IRP Site 1 is located in the northeastern portion of Former MCAS El Toro (Figures 1 and 2). *IRP* Site 1 includes two distinct areas: an on-Station Area known as the EOD Training Range (previously Navy property) and an off-Station Area referred to as the Adjacent Property (never-Navy-owned property).

The EOD Training Range is approximately 74 acres in size and includes a Northern and a Southern EOD Training Range. EOD training exercises were conducted from 1952 until the closure of Former MCAS El Toro. Military ordnance handled at the site included hand grenades, land mines, cluster bombs, smoke bombs, and rocket-propelled munitions. Civilian commercial-grade explosives, such as dynamite, and plastic and gelatinous explosives were also handled at the EOD Training Range. Historical information suggests that rocket motors or Jet-Assisted Take-Off units were also handled at the EOD Training Range. The EOD Training Range is east of the Adjacent Property and was recently transferred by the Navy to the Federal Bureau of Investigation (FBI), which conducts training operations within limited areas of its property and uses the remainder of the acreage as a natural buffer zone. The EOD Training Range will be incorporated into the existing buffer zone; no training operations will occur within this area.

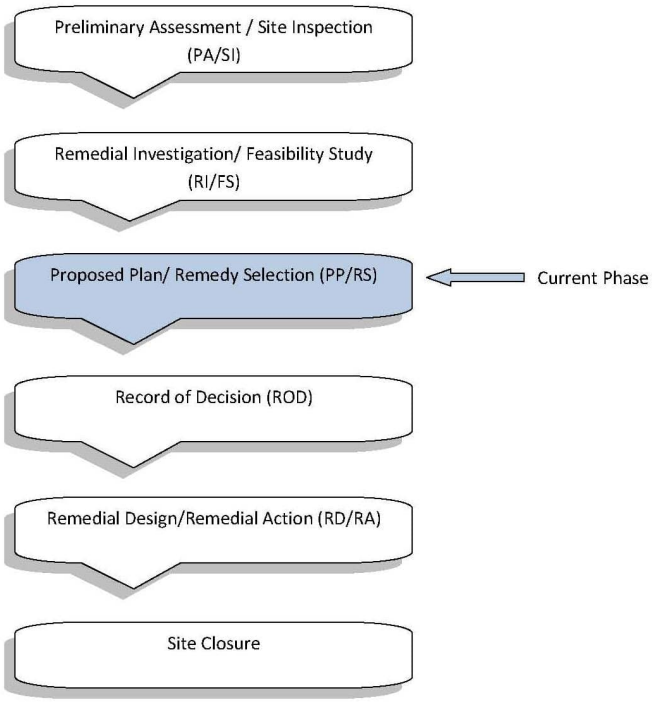
The Adjacent Property is located immediately west of the EOD Training Range (Figure 1) and consists of approximately 44 acres of open space. ***Kick-outs*** from training activities conducted at the EOD Training Range were a potential source of munitions items in the soil at the Adjacent Property.

PREVIOUS INVESTIGATIONS

Various environmental investigations have been performed at *IRP* Site 1 as a part of the *CERCLA* process to characterize the physical attributes of the site including the geology and hydrogeology, the nature and extent of impacts, potential risks to human health and the environment, and the feasibility of potential cleanup technologies.

CERCLA PROCESS OVERVIEW

COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT (CERCLA) PROCESS



SOIL INVESTIGATIONS

EOD TRAINING RANGE

Investigations at the EOD Training Range included soil sampling for ***volatile organic compounds***, ***semivolatile organic compounds***, perchlorate, explosives residues, N-nitrosodimethylamine, ***petroleum hydrocarbons***, metals, dioxins/furans, and radionuclides, as well as a munitions characterization and *MEC* range evaluation. Based on the results of these investigations, the BCT concurred that the only significant chemical requiring further consideration was naphthalene. Soil investigations at the EOD Training Range also identified metallic anomalies that have the potential to contain *MEC*.

Naphthalene was reported in soil in the central portion of the Northern EOD Training Range at concentrations exceeding the 2004 State of California residential ***preliminary remediation goal (PRG)*** of 1,700 micrograms per kilogram (µg/kg) and the 2004 U.S. EPA residential *PRG* of 56,000 µg/kg. Figure 2 presents the approximate location of naphthalene-impacted soil.

MEC items were found in the soil at the Northern EOD Training Range. Additionally, munitions debris (an older term for what is now referred to as ***Material Documented as Safe*** [***MDAS***]) was found at the surface and in the soil at the Northern and Southern EOD Training Ranges. The area surrounding both ranges and the Range Perimeter also contained munitions debris. The *MEC* and *MDAS*

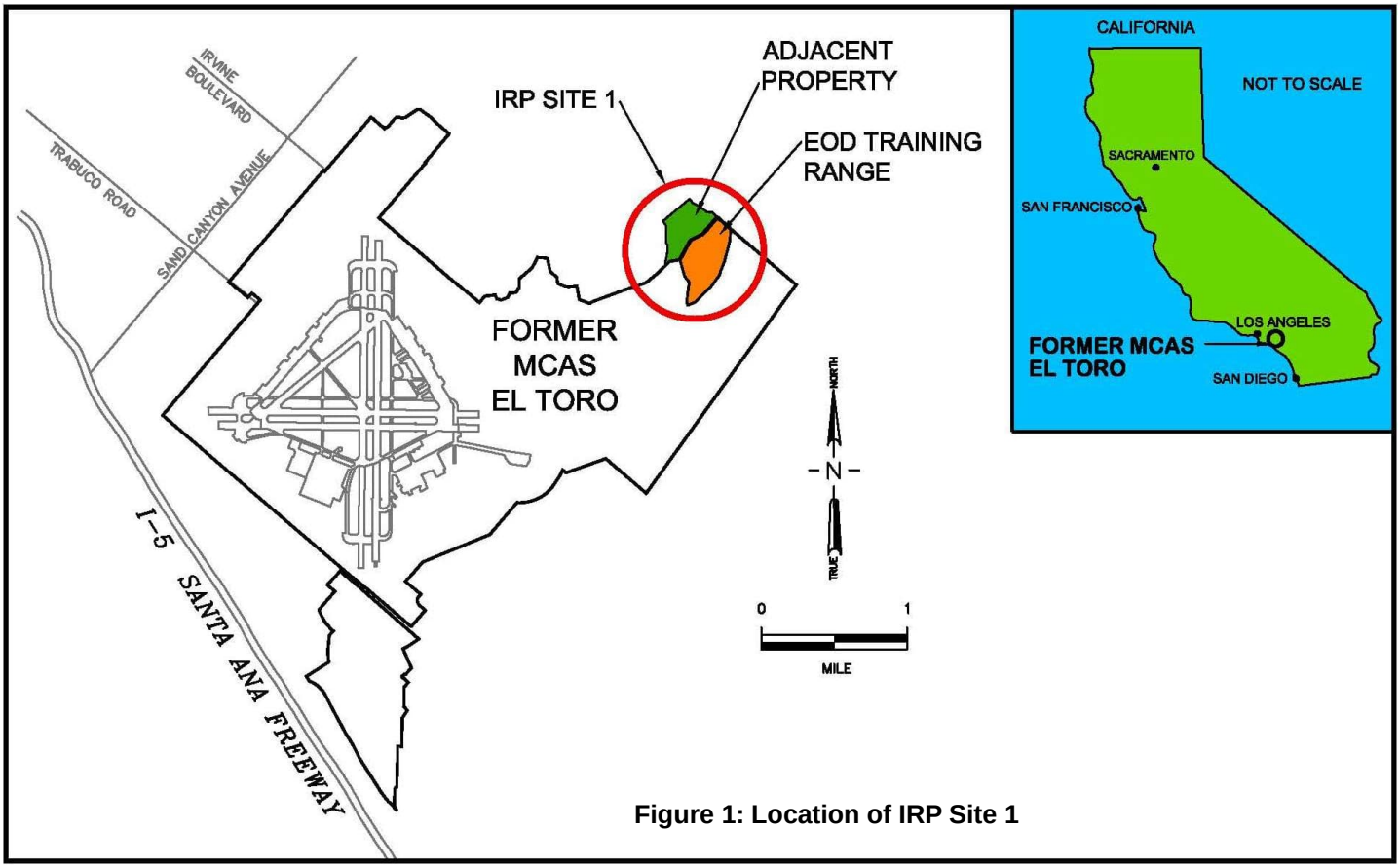


Figure 1: Location of IRP Site 1

items found during the investigations were removed. Metallic anomalies and potential MEC were not fully investigated and are to remain on the EOD Training Range because the FBI plans to use this property as a natural buffer zone for its training operations (Figure 2).

Adjacent Property

Investigations at the Adjacent Property included a munitions characterization conducted in 2008 to verify the extent of potential *MEC* and *MDAS* present as a result of historical activities at the EOD Training Range. Twenty-five *MEC* items were removed from the ground surface during this investigation. Due to the presence of munitions on the Adjacent Property, in 2010 the Navy initiated actions to remove and address the potential explosive safety hazards found during the 2008 investigation. This immediate action to remove munitions is referred to as a ***time-critical removal action (TCRA)***.

For purposes of the 2010 *TCRA*, the Adjacent Property was subdivided into Areas A, B, and C based, in part, on results from the 2008 munitions characterization and the relative probability of encountering MEC: 1) Area A, property owned by The Irvine Company (TIC), was designated as having a relatively high probability of encountering material potentially presenting explosive hazard (MPPEH) based primarily on its close proximity to the western boundary of the EOD Training Range; 2) Area B, property owned by the Orange County Flood Control District (OCFCD), was designated as having a relatively low probability of encountering MPPEH; and 3) Area C, property owned by TIC, was also designated as having a relatively low probability of encountering MPPEH. Area C includes the area west of Agua Chinon Retarding Basin (ACRB; Figure 3) and was included in the 2010 TCRA because during the 2008 munitions characterization activities, one 2-inch by 4-inch metal fragment was identified and removed from this area.

The ACRB was excluded from the 2010 *TCRA* as it was classified as an area of low probability for encountering munitions. In addition, approximately 8 acres were not comprehensively evaluated due to the presence of steep terrain and/or dense vegetation; however, these areas were visually inspected to the maximum extent practicable at that time and again with the assistance of all-metals detectors in 2022.

A subsequent TCRA was conducted in 2018 and is referred to as the 2018 TCRA. During the 2018 TCRA, soil from the top 12 inches was removed from both Area B (TCRA) and Area C, including 2 of the 8 acres that were previously not comprehensively evaluated during the 2010 TCRA. Following this topsoil removal, surveys were conducted over the newly-established surface grade to identify any anomalies indicative of munitions. Surveys were also conducted within ACRB, although pre-survey soil removal was not conducted. The results from these digital geophysical mapping surveys showed that there were no anomalies indicative of munitions.

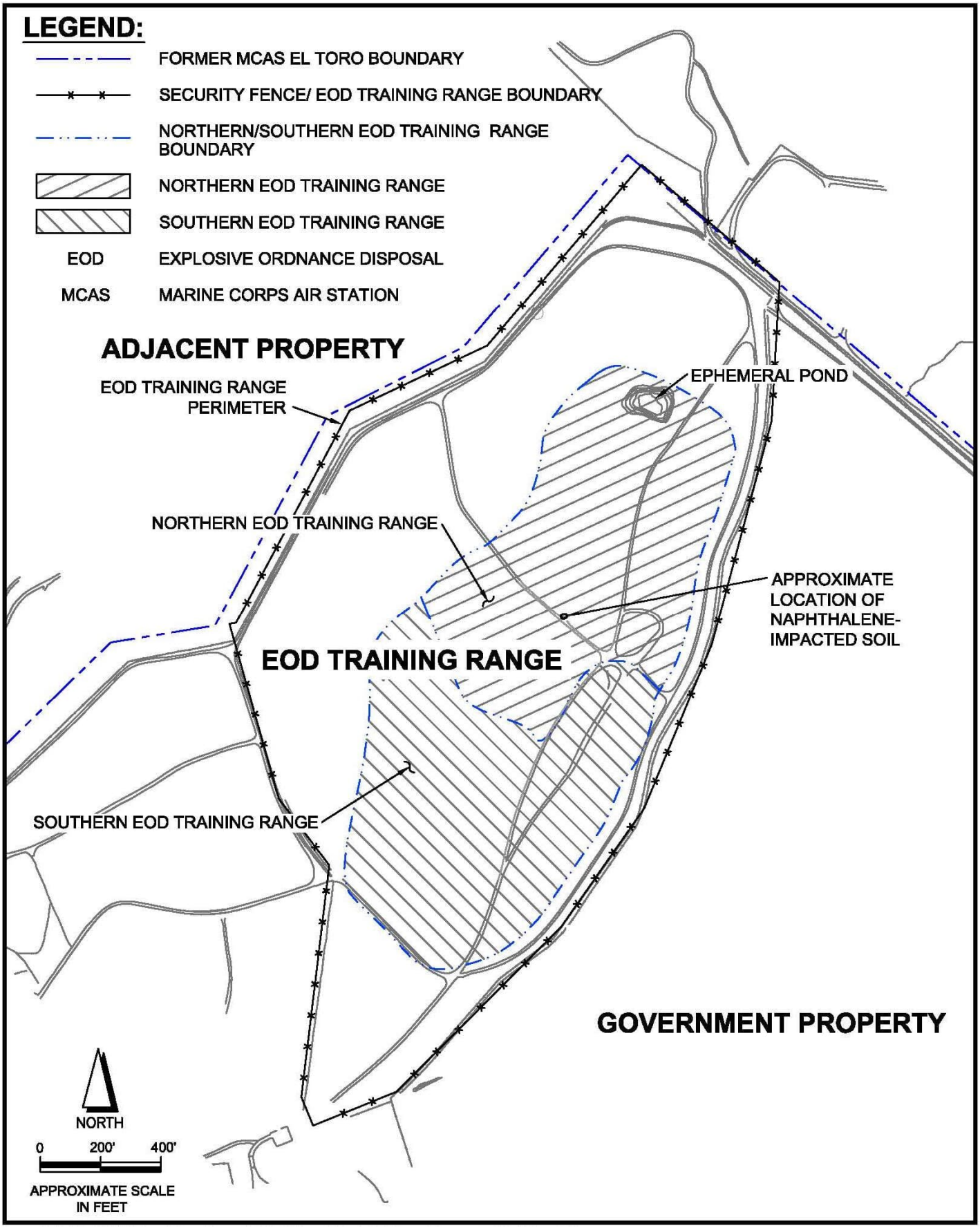


Figure 2: EOD Training Range Site Plan and Naphthalene-Impacted Soil Area

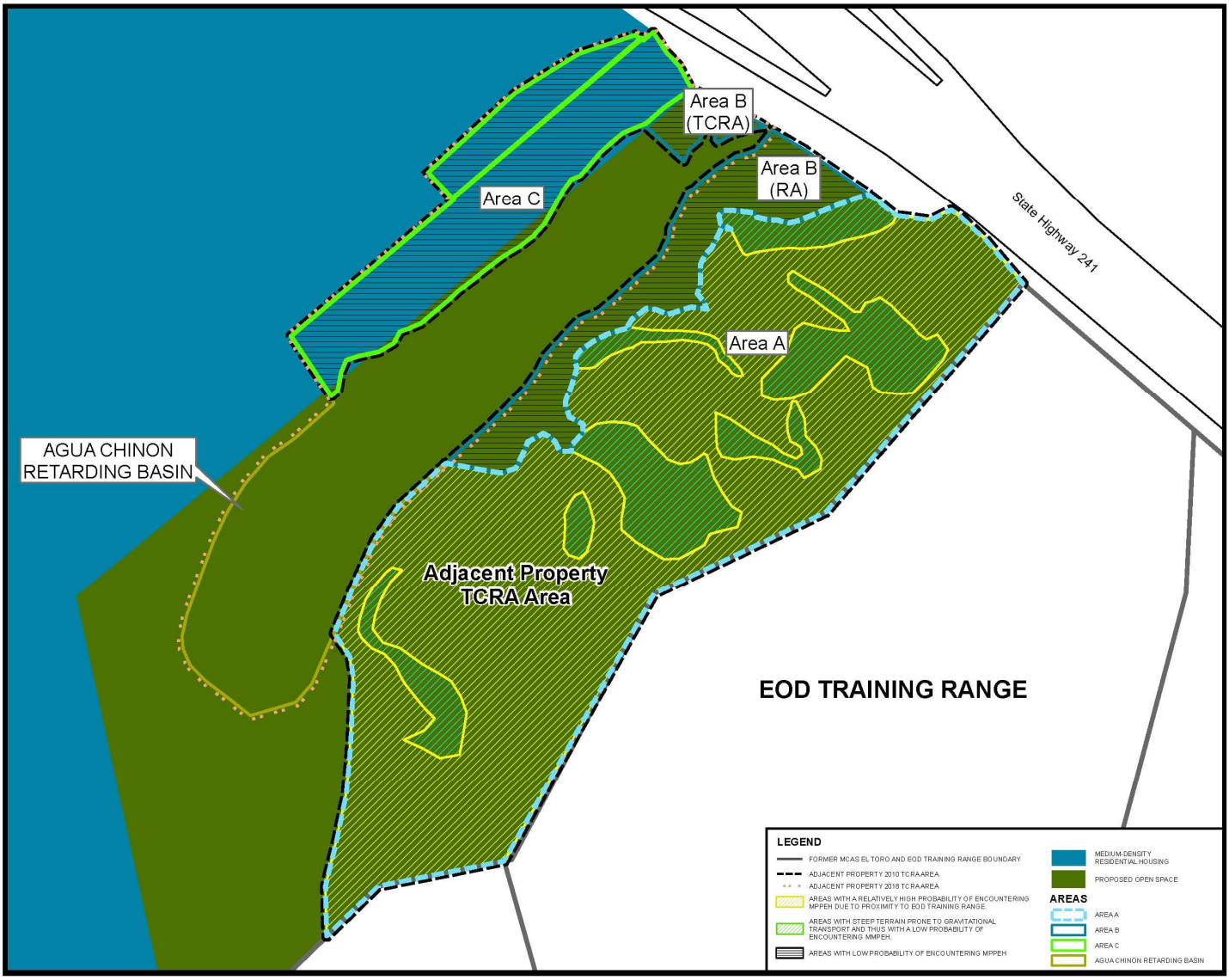


Figure 3: Adjacent Property Area

Based on these results, the Final Removal Action Report concluded there were sufficient lines of evidence to recommend unlimited use/unrestricted exposure (UU/UE) for Area B (TCRA), Area C, and ACRB. The BCT subsequently concurred with these findings. As a result, the Final ***FS*** Report evaluated whether the 2018 TCRA meets the final remedy performance and protectiveness as well as response action alternatives for the other areas not addressed by the 2018 TCRA, namely Area A and Area B ***Remedial Action (RA)***.

Risk Assessment Process

"Risk" is the likelihood or probability that a hazardous chemical, when released to the environment, will cause adverse impacts to humans or other ecological receptors. ***Human Health Risk Assessments (HHRAs)*** were performed as part of ***RIs*** to evaluate the potential for adverse human health effects due to potential exposure to impacted soil associated with the EOD Training Range.

Human health risks can be classified as cancerous (from exposure to carcinogens) or noncancerous (from exposure to non-carcinogens). Cancer risk is expressed as a statistical probability and is not based on actual cases of cancer. It estimates the probability that an individual's baseline or normal risk of cancer could increase because of exposure. This risk is generally expressed as an upper bound probability. For example, a 1-in-10,000 chance is a risk of 1×10^{-4}. In this case, for every 10,000 people, one additional cancer case may occur because of exposure. A 1-in-1,000,000 chance is a risk of 1×10^{-6}. In this case, for every 1,000,000 people, one additional cancer case may occur as a result of exposure. Based on U.S. EPA guidance, the risk management range is 10^{-4} to 10^{-6}. This range was established to set guidelines for making risk management decisions.

Noncarcinogenic (noncancer) risk from a single chemical is expressed as a number called a ***Hazard Quotient (HQ)***, which is estimated by comparing a chemical's exposure dose or concentration at a given site with reference values. The sum of the *HQs* for all chemicals at a site is referred to as the ***Hazard Index (HI)***. An *HI* of 1 or less is considered an acceptable exposure level for noncancerous health hazards.

The Navy considered different ways that human receptors might be exposed to chemicals, the possible concentrations of chemicals that could be encountered during exposures, and the potential frequencies and durations of exposures, based on various potential future uses at the EOD Training Range. Risk calculations were based on "conservative" assumptions, which tend to overestimate risk, resulting in cleanup goals that are more protective of human health. The residential scenario is considered the most conservative as it assumes that hypothetical residents would live at the EOD Training Range and would be potentially exposed to impacted soil for a period of 30 years.

A *MEC* Hazard Assessment (HA) was also conducted to quantify the explosive hazards that currently exist at the EOD Training Range and the Adjacent Property as well as under future land conditions.

Ecological Risk Assessment

The results of the Ecological Risk Assessment determined that no further action is necessary to protect ecological receptors at the EOD Training Range. However, while the overall ecological risk to receptors was not considered to be adverse, the California Department of Fish and Wildlife expressed a concern that impacted soil may pose an adverse effect on individual receptors and supported the recommendation that the *FS* evaluate how remedial alternatives developed for the naphthalene cleanup may also serve to reduce ecological risks.

EOD Training Range Human Health Risk Assessment

The risk estimates discussed in the following paragraphs were prepared using U.S. EPA Region 9 toxicity criteria. Potential cancer risk for residential receptors from exposure (ingestion, skin contact, and inhalation) to impacted surface and subsurface soil was estimated to be 8×10^{-6} and 1×10^{-5}, respectively. The corresponding risk based on the California toxicity criteria were 1×10^{-4} and 1×10^{-4}, respectively. The concentration that receptors would likely be exposed to is referred to as the ***exposure point concentration (EPC).*** Arsenic contributed a majority of the cancer risk. For arsenic in soil, the EPC was estimated to be 2.79 milligrams per kilogram (mg/kg), which is below the established Former MCAS El Toro ***background*** concentration of 6.86 mg/kg. Because arsenic and other metal concentrations were in the same range as surrounding non-impacted soil (i.e., naturally occurring), no cleanup action is required for metals.

The noncancer *HI* (sum of individual *HQs* of individual constituents) for all complete exposure pathways (ingestion, dermal, inhalation, and indoor air) exceeds an *HI* of 1. Naphthalene in indoor air is the main contributor to the total *HI*. Therefore, naphthalene was selected as the ***chemical of concern*** for remedial alternatives developed in the *FS*. It is anticipated that a human health–based cleanup action conducted for naphthalene-impacted soil would reduce the potential ecological risk and overall site risk.

Potential risk through exposure to vapor intrusion in indoor air (an incomplete receptor pathway under the current and proposed reuse) was estimated to be 2×10^{-5}. The corresponding risk associated with the use of California-modified toxicity values was 9×10^{-4}.

Potential residential risk from exposure to ephemeral pond sediment and surface water was estimated to be 2×10^{-6} and 3×10^{-5}, respectively. The corresponding risk associated with the use of California-modified toxicity values was 2×10^{-5} and 2×10^{-4}, respectively. While arsenic contributed a majority of the cancer risk, its concentration was consistent with the *background* value.

The noncancer *HI* for sediment and surface water were less than 1. Therefore, no cleanup action is required for sediment and surface water.

EOD Training Range MEC Hazard Assessment

The *MEC* HA methodology (U.S. EPA 2008) was developed for evaluating potential explosives hazards to human receptors. Each scenario evaluated by the *MEC* HA produces a score that is associated with one of four ***hazard levels*** (1 through 4, with 4 being the lowest). These hazard levels reflect the interaction between the current or future human activities and the types, amounts, and conditions of *MEC* items. The *MEC* HA methodology does not provide an evaluation of what is an acceptable score/level; rather, the results are used to compare different remedial alternatives. The *MEC* HA methodology was used to evaluate a baseline hazard for *MEC*-impacted soil at the EOD Training Range because the future land use is consistent throughout the site; the baseline hazard score under future use activities was 625 (*Hazard Level* 3).

Adjacent Property MEC Hazard Assessment

After completion of the two *TCRAs*, the *MEC* HA methodology was used to compare pre-removal-action explosive hazards with post-removal-action explosive hazards under future land use conditions (open space for Areas A and B, and medium-density residential housing for Area C). Results of the *MEC* HA for the Adjacent Property indicated a baseline hazard score of 675 (*Hazard Level* 3) and a post-*TCRA* hazard score of 350 (*Hazard Level* 4), the lowest *MEC* Hazard Category.

Remedial Alternatives

Based on the potential exposure pathways and potential risks to human health and the environment, the following ***remedial action objective (RAO)*** was developed for remediation of naphthalene-impacted soil on-Station:

- Reduce the potential for exposure to naphthalene-impacted soil that would result in unacceptable risks to future receptors at the EOD Training Range.

The *FS* developed, evaluated, and compared the remedial alternatives to achieve the following *RAO* for remediation of *MEC*-impacted soil at the EOD Training Range and Adjacent Property:

- Reduce the potential for exposure to *MEC* that would result in unacceptable hazards to future receptors at *IRP* Site 1.

Descriptions of the remedial alternatives developed for the naphthalene-impacted soil at the EOD Training Range and *MEC*-impacted soil at *IRP* Site 1 are presented below.

EOD Training Range Naphthalene-Impacted Soil

Three remedial alternatives were developed for remediation of naphthalene-impacted soil at the EOD Training Range.

Alternative N-1: No Action

Alternative N-1 was developed to provide a baseline from which to evaluate other remedial alternatives. Under this alternative, no *ICs*/access restrictions, treatment, removal, or disposal would be implemented for naphthalene-impacted soil.

Alternative N-2: ICs and Access Restrictions

Alternative N-2 would rely primarily on *ICs* and/or access restrictions to minimize the potential for exposure to naphthalene-impacted soil that would result in risks to human health, and there would be no reduction in potential ecological risk at the site. The *ICs* would include land use restrictions (e.g., prevent digging or construction of either commercial or residential structures) in the area with naphthalene-impacted soil to limit potential exposure of future landowner(s) and/or user(s) and to maintain the integrity of physical controls used to restrict unauthorized access and/or use of the site. Under this alternative, five-year reviews would be required. The estimated cost for Alternative N-2 is approximately $0.2 million (M).

Alternative N-3: Excavation and Off-Site Disposal of Naphthalene-Impacted Soil

Alternative N-3 would include excavation of naphthalene-impacted soil from the central portion of the EOD Training Range (Figure 2) and disposal at an appropriate off-Station facility. Pre-excavation soil sampling will be performed to better define the lateral extent of naphthalene-impacted soil. The area that would be excavated is approximately 700 feet southwest of and downhill from the ephemeral pond, where a population of fairy shrimp exists. The Navy would avoid staging, transportation, and developing access routes in the area of the ephemeral pond.

Since the naphthalene-impacted soil is collocated with *MEC*-impacted soil, the objective of the naphthalene *RA* would be risk reduction for both potential human and ecological receptors. To achieve this objective, the naphthalene-impacted soil would be excavated vertically to a maximum depth of 10 feet below ground surface (bgs) and laterally until the site-specific risk reduction goal for naphthalene of 8,100 µg/kg has been achieved. Once sampling results confirm that the goal

has been achieved, the excavated area would be backfilled with clean soil.

Following soil excavation, if residual naphthalene concentrations are protective of residential receptors, then Alternative N-3 would be the final action for the naphthalene-impacted soil area and as such, five-year reviews would not be required for this alternative. However, if residual naphthalene concentrations are not protective of residential receptors, *ICs* similar to those described in Alternative N-2 would be implemented and five-year reviews would be required. Also, should the site use change in the future, soil and soil vapor sampling may be required up to a depth of 20 feet to assess the potential for vapor intrusion. Costs for these additional requirements would be similar to the cost for Alternative N-2. The estimated cost for Alternative N-3 is approximately $0.3M.

EOD Training Range MEC-Impacted Soil

Four remedial alternatives were developed for *MEC*-impacted soil at the EOD Training Range.

Alternative M-1: No Action

The No Action Alternative was developed to provide a baseline from which to compare other remedial alternatives. Under this alternative, no *ICs*/access restrictions or *MEC* removal would be implemented to minimize the potential for exposure to the *MEC*-impacted soil. Because no action would be taken under this alternative, it was used as the baseline for the *MEC* HA, with a score of 625 (*Hazard Level* 3).

Alternative M-2: ICs and Access Restrictions

Alternative M-2 would rely primarily on *ICs*, including legal and/or administrative mechanisms to limit potential human exposure to *MEC*. In addition to *ICs*, access restrictions (e.g., the use of the existing perimeter fence and permanent markers such as warning signs, which would be maintained in the future) would be implemented to minimize the potential for unauthorized entry and/or use of the site due to the munitions that would remain. Under this Alternative, the future land use for the site would be like-use for range buffer purposes. Five-year reviews would be required. The *MEC* HA score for this alternative was 585 (*Hazard Level* 3). The estimated cost for Alternative M-2 is approximately $0.3 M.

Alternative M-3: Near-Surface Excavation and Off-Site Disposal of MEC Items and ICs and Access Restrictions

Alternative M-3 would include a surface clearance throughout the EOD Training Range and a soil excavation to a depth of 1.5 feet bgs in the Northern and Southern EOD Training Ranges to reduce the potential for direct contact with *MEC* items. Prior to excavation, a survey would be conducted to identify potential munitions. The items removed during the survey would be evaluated to assess whether they pose an explosive hazard. The excavated soil would be sifted on-site to remove any remaining metallic objects, which would be evaluated to determine their potential *MEC* hazard; if necessary, the hazard would be removed, and the inert debris would be transported off-site as metallic scrap. Under this alternative, identified *MEC* items would be removed such that the EOD Training Range would not pose an elevated explosive safety hazard to potential human receptors under the open space/wildlife reserve scenario. Because the removal of near-surface *MEC* items under this alternative would not result in unrestricted use for the site, *ICs* and access restrictions would be implemented to ensure protection of human health, and five-year reviews would be required. The *MEC* HA score following implementation of this alternative would be 350 (*Hazard Level* 4). The estimated cost for Alternative M-3 is approximately $5.7 M.

Alternative M-4: Comprehensive Excavation and Off-Site Disposal of MEC Items

Alternative M-4 would include removal of *MEC* items in the areas within the Northern and Southern EOD Training Ranges consistent with current residential reuse protocols through excavation to the maximum depth *MEC* is encountered and to an average depth of 8 feet bgs within the Training Ranges (the maximum depth of *MEC* removed during previous investigations). Soil and removed *MEC* items would be evaluated as described above in Alternative M-3. After excavation, surveys would be conducted to search for any additional metallic anomalies, which would then be investigated and removed. Under this alternative, identified *MEC* would be removed to the greatest extent practicable, consistent with DTSC's recommended residential protocol. Alternative M-4 would be a final action for *MEC*-impacted soil, and five-year reviews would not be required. Following implementation of Alternative M-4, the site would be released for UU/UE. In addition, post-*RA* notifications would be implemented by way of a letter, notifying the landowners about the potential presence of *MEC* items. The *MEC* HA score following implementation of this alternative would be 280 (*Hazard Level* 4). The estimated cost for Alternative M -4 is approximately $17.4 M.

Adjacent Property MEC-Impacted Soil

Four remedial alternatives were developed for *MEC*-impacted soil at Area A and Area B(RA) at the Adjacent Property.

Alternative AP-1: No Action

The No Action Alternative was developed to provide a baseline from which to compare other remedial

alternatives. Because no action would be taken under this alternative, it's *MEC* HA score of 350 (*Hazard Level* 4) was used as a baseline score for comparing other alternatives.

Alternative AP-2: ICs and Access Restrictions

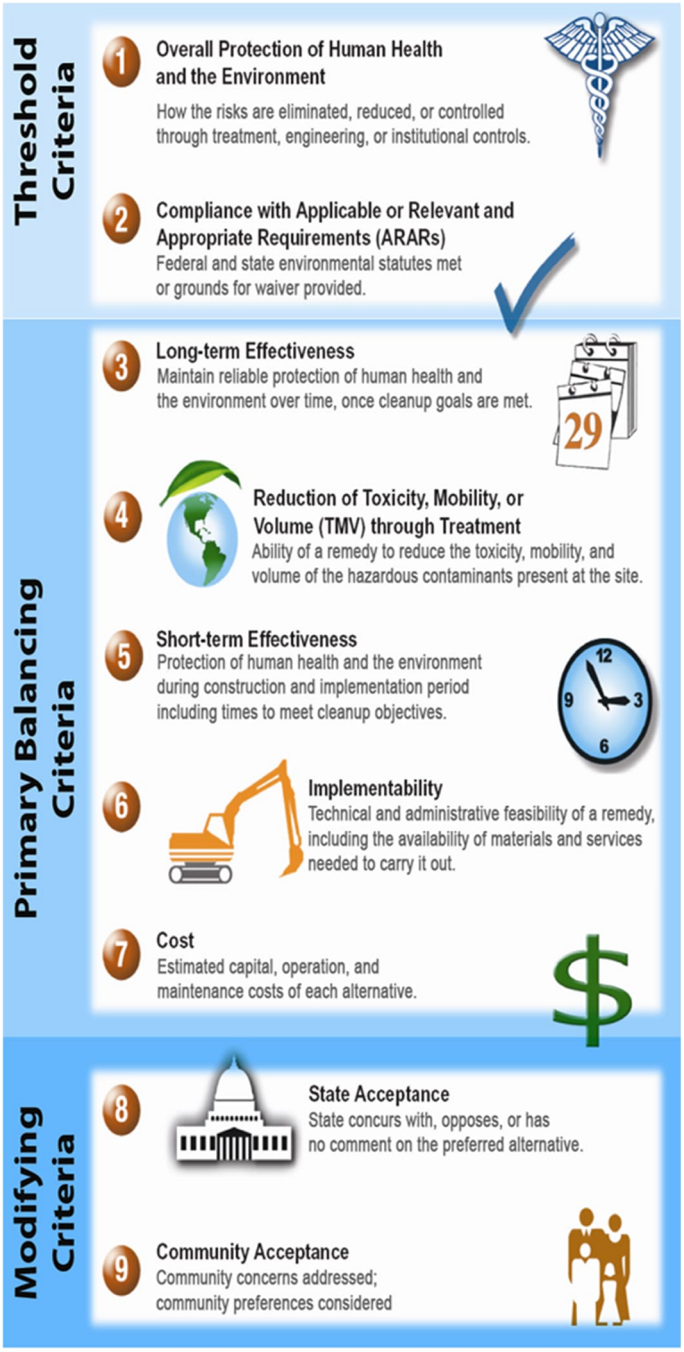
Under Alternative AP-2, no removal of *MEC* items would be performed and *ICs* would be implemented by providing notifications to the current landowners, TIC and OCFCD, about the potential presence of *MEC* items on the Adjacent Property. The notifications would state that the *MEC* items (primarily 20-millimeter projectiles) are *kick-outs* from EOD training activities conducted within the boundaries of the EOD Training Range and are potentially present on the Adjacent Property. If present, these items are anticipated to be found at or near the ground surface to a maximum depth of 18 inches. The *MEC* hazard would remain unchanged (i.e., post-*TCRA MEC* HA score of 350). In addition to ICs, access restrictions would be implemented to minimize the potential for unauthorized entry and/or use of the site. This alternative will not attain the same level of protection as DTSC's recommended residential protocol. Therefore, notifications to the property owners would provide additional awareness of the potential explosive hazard and would thus reduce the potential for encountering munitions. As a result, five-year reviews would be required. The estimated cost for Alternative AP-2 is approximately $0.3 M.

Alternative AP-3: MEC Survey of Six Remaining Acres and ICs

Under Alternative AP-3, a geophysical survey to identify and remove *MEC* items would be conducted on the approximately 6 acres that were not comprehensively investigated during the 2010 *TCRA* due to the presence of steep terrain and/or dense vegetation and not included in the 2018 *TCRA* activities; however, these areas were visually inspected to the maximum extent practicable during the 2010 TCRA and again with the assistance of all-metals detectors in 2022. Any remaining individual metallic anomalies present would be identified using handheld geophysical instruments (e.g., metal detectors). The metallic objects would be evaluated to determine their potential *MEC* hazard, and if necessary, the explosive hazard would be removed and the inert debris would be transported off-site as metallic scrap. Under Alternative AP-3, identified *MEC* would be removed to a depth of 18 inches so that it does not result in unacceptable hazards to potential future human receptors. As discussed under Alternative AP-2, *ICs* would be implemented by providing notification to the current landowners, TIC and OCFCD, about the potential presence of *MEC* items. As a result, five-year reviews would be required. The estimated cost for Alternative AP-3 is approximately $0.7 M.

Alternative AP-4: Comprehensive MEC Removal and Verification

Under Alternative AP-4, removal of MEC items would be conducted consistent with current residential reuse protocols



through excavation to the maximum depth MEC is encountered (for Area A and Area B [*RA*]) . A geophysical survey would be conducted to verify removal of MEC. Under this alternative, MEC would be removed from the Adjacent Property in accordance with DTSC's recommended residential protocol to the extent practicable such that it does not result in unacceptable hazards to potential future human receptors. However, as discussed under Alternative AP-2, notifications similar to those discussed under Alternative AP-2 would be sent to the current owners, TIC and OCFCD, about the potential presence of MEC items at Areas A and B (RA) at the Adjacent Property. This alternative would result in a clearance depth of up to 18 inches throughout the Adjacent Property and would be a final action for MEC-impacted soil. As such, 5-year

Evaluation of Remedial Alternatives

Every alternative has undergone a detailed evaluation and analysis using the nine criteria set forth in the *NCP*, which are categorized into three groups: threshold criteria, primary balancing criteria, and modifying criteria. Threshold criteria must be satisfied in order for an alternative to be eligible for selection. Primary balancing criteria are used to weigh major tradeoffs among alternatives. Generally, modifying criteria are taken into account after public comments are received on the *Proposed Plan* and reviewed with the various federal and state regulatory agencies to determine if the *preferred alternative* remains the most appropriate remedy. The nine *NCP* criteria are defined on Page 9 and are accompanied by key points from the evaluation of the alternatives. Alternatives are rated "good", "fair", or "poor" based on their performance under each criterion.

For example, an alternative that is substantially easier to implement than other alternatives is rated high in implementability. Similarly, an alternative that would be significantly lower in cost than the other alternatives is rated high under cost because it would perform most favorably within the cost comparison. The alternatives are ranked based on their protectiveness and on their ability to meet the *RAOs*. Results from this evaluation are summarized in Tables 1 through 3.

Table 1: Summary of Comparative Analysis of Alternatives – Naphthalene-Impacted Soil at the EOD Training Range

U.S. EPA Criteria	N-1 No Action	N-2 *ICs* and Access Restrictions	N-3 Excavation and Off-Site Disposal
Overall Protection of Human Health and the Environment	Does not Meet the Criterion	Meets the Criterion	Meets the Criterion
Compliance with *ARARs*	Not Applicable	Meets the Criterion	Meets the Criterion
Long-Term Effectiveness	○	◑	●
Reduction of Toxicity/Hazards, Mobility, and Volume through Treatment	○	○	◑
Short-Term Effectiveness	●	●	◑
Implementability	●	◑	○
Cost (Present value in millions of dollars for comparison purposes)	Not Applicable	● $0.2 M	● $0.3 M
State Acceptance	The State of California agrees with the *preferred alternative*.		
Community Acceptance	To be evaluated after public comment period.		
Relative Performance in Satisfying Criteria: ○ Poor ◑ Fair ● Good			
Notes: There would be additional costs associated with Alternative N-3 if *ICs* and five-year reviews are required.			

Table 2: Summary of Comparative Analysis of Alternatives – MEC-Impacted Soil at the EOD Training Range

U.S. EPA Criteria	M-1 No Action	M-2 *ICs* and Access Restrictions	M-3 Near-Surface Excavation and Off-Site Disposal of *MEC* Items and *ICs* and Access Restrictions	M-4 Comprehensive Excavation and Off-Site Disposal of *MEC* Items
Overall Protection of Human Health and the Environment	Does not Meet the Criterion	Meets the Criterion	Meets the Criterion	Meets the Criterion
Compliance with *ARARs*	Not Applicable	Meets the Criterion	Meets the Criterion	Meets the Criterion
Long-Term Effectiveness	○	◑	◕	●
Reduction of Toxicity/ Hazards, Mobility, and Volume through Treatment	○	○	◑	●
Short-Term Effectiveness	●	●	◕	◑
Implementability	●	◕	◑	◔
Cost (Present value in millions of dollars for comparison purposes)	Not Applicable	● $0.3 M	◑ $5.7 M	○ $17.4 M
State Acceptance	The State of California agrees with the *preferred alternative*.			
Community Acceptance	To be evaluated after public comment period.			

Table 3: Summary of Comparative Analysis of Alternatives – MEC-Impacted Soil at the Adjacent Property

U.S. EPA Criteria	AP-1 No Action	AP-2 *ICs* and Access Restrictions	AP-3 *MEC* Survey of Six Remaining Acres and *ICs*	AP-4 Comprehensive *MEC* Removal and Verification
Overall Protection of Human Health and the Environment	Does not meet the Criterion	Meets the Criterion	Meets the Criterion	Meets the Criterion
Compliance with *ARARs*	Not Applicable	Meets the Criterion	Meets the Criterion	Meets the Criterion
Long-Term Effectiveness	○	◑	◕	●
Reduction of Toxicity/Hazards, Mobility, and Volume through Treatment	○	○	◑	●
Short-Term Effectiveness	●	●	◕	◑
Implementability	●	◕	◑	◔
Cost (Present value in millions of dollars for comparison purposes)[1]	Not Applicable	● $0.3 M	◑ $0.7 M	○ $4.7 M
State Acceptance	The State of California agrees with the *preferred alternative*.			
Community Acceptance	To be evaluated after public comment period.			

Relative Performance in Satisfying Criteria: ○ Poor ◔ Poor to fair ◑ Fair ◕ Fair to Good ● Good

PREFERRED REMEDIES

Based on the analyses of alternatives, the preferred remedies for *IRP* Site 1 are presented below. Specific details regarding implementation of the remedies will be developed during the remedial design phase.

EOD Training Range Naphthalene-Impacted Soil

- Alternative N-3: Excavation and Off-Site Disposal of Naphthalene-Impacted Soil

This alternative meets the threshold criteria (Table 1) for overall protection of human health and the environment and compliance with ***applicable or relevant and appropriate requirements (ARARs)*** and would achieve the project *RAOs*. It is rated the highest overall for all *NCP* criteria except for *"short-term effectiveness"* and *"implementability"* because there is an active remediation phase for this alternative. Alternative N-3 would provide protection of human health and the environment through excavation of naphthalene-impacted soil from the central portion of the EOD Training Range exceeding its site-specific risk reduction goal. However, if residual naphthalene concentrations are not protective of residential receptors, *ICs* similar to those described in Alternative N-2 will be implemented and five-year reviews would be required. Costs for these additional requirements would be similar to the cost for Alternative N-2.

EOD Training Range MEC-Impacted Soil

- Alternative M-2: *ICs* and Access Restrictions

This alternative meets the threshold criteria (Table 2) for overall protection of human health and the environment and compliance with *ARARs* and would achieve the project *RAOs*. It is rated the highest overall for all *NCP* criteria except for *"long-term protectiveness"* and *"reduction of toxicity/hazards, mobility, and volume through treatment"* because there is no active remediation for this alternative. Under this alternative, effective implementation of ICs would ensure that the EOD Training Range is used in a manner protective of human health in the long term. ICs and access restrictions are relatively easy to implement. Five-year reviews would be conducted to evaluate the continued protectiveness of the remedy.

Adjacent Property MEC-Impacted Soil

- Alternative AP-3: MEC Survey of Six Remaining Acres and ICs

This alternative meets the threshold criteria (Table 3) for overall protection of human health and the environment and compliance with *ARARs* and would achieve the project *RAOs*. Alternative AP-3 is considered protective of human health and the environment since it involves reducing site risks/hazards by removing the MEC items within the six acres that were not comprehensively investigated during the 2010 TCRA and the 2018 TCRA. *ICs* would be implemented by providing notification to the current landowners, TIC and OCFCD, about the potential presence of *MEC* items. Effective implementation of *ICs* would ensure protectiveness of human health in the long term. Since this alternative will not achieve UU/UE criteria, Alternative AP-3 would require five-year reviews.

Multi-Agency Team Concurs with the IRP Site 1 Preferred Remedies

The BCT was involved in the review of all major documents and activities associated with *IRP* Site 1. These reviews included the *RI* and *FS* Reports, which included detailed *HHRAs*, and an evaluation of the effectiveness of the soil remedial alternatives for the EOD Training Range and the Adjacent Property, including how these alternatives meet the nine *NCP* evaluation criteria (see pages 9 through 11). Based on reviews of and discussions on these key documents and activities, the other members of the BCT concur with the Navy's recommendation for Alternative N-3 for the naphthalene-impacted soil, Alternative M-2 for MEC-impacted soil at the EOD Training Range, and Alternative AP-3 for MEC-impacted soil at the Adjacent Property.

How Do You Provide Input to the Navy?

Providing Comments on this Proposed Plan

You are invited to attend a public meeting to discuss the information presented in this *Proposed Plan* regarding the proposed cleanup of soil at Former MCAS El Toro *IRP* Site 1. Navy representatives will provide visual displays and information on the investigations and the cleanup alternatives evaluated. You will have the opportunity to ask clarifying questions and formally comment on the alternatives.

There are two ways to provide comments during the public comment period from **March 7 to April 6, 2023**:

- Provide oral comments during the public meeting on **March 8, 2023** at Irvine Civic Center, Room L-102, 1 Civic Center Plaza, Irvine, CA; or

- Provide written comments by mail or e-mail to the Navy no later than **April 6, 2023** (see contact information below).

Please send all written comments to:

Ms. Elizabeth A. Roddy
BRAC Environmental Coordinator
Former MCAS El Toro
33000 Nixie Way, Bldg. 50, Floor 2
San Diego, CA 92147
(619) 524-4048
elizabeth.a.roddy3.civ@us.navy.mil

Public comments received during this period or in person at the public meeting will be included in the Responsiveness Summary section of the *ROD* and considered in the final soil remedy decisions for *IRP* Site 1. Community members interested in the full technical details beyond the scope of this *Proposed Plan* can find key supporting documents that pertain to *IRP* Site 1 and a complete index of all Navy Former MCAS El Toro documents at the *AR File*.

Administrative Record File Location

The complete *AR* File of documents for all of Former MCAS El Toro, including site-specific files for *IRP* Site 1, is available for review at the Former MCAS El Toro Administrative Record, administered by Ms. Diane Silva at 750 Pacific Highway, Code EV33, Naval Base San Diego, Building 3519, San Diego, CA 92132-5190. To schedule a review time at the *AR* during the public comment period, contact Ms. Silva at (619) 556-1280. Alternatively, conduct a search for records at https://go.usa.gov/xhqE5

Restoration Advisory Board

The Navy provides information on the cleanup of *IRP* Site 1 to the public through public meetings, the *AR* File for the site, and notices in local newspapers or via other mechanisms that provide for adequate community notification. Restoration Advisory Board (RAB) meetings are typically held semiannually in March and September and are open to the public. Please visit the Navy's website for more RAB information: https://go.usa.gov/xhqEK

PROJECT CONTACTS

Ms. Elizabeth A. Roddy	**Ms. Mary Aycock**	**Ms. Michelle Micucci**	**Ms. Patricia Hannon**
BRAC Environmental Coordinator Base Realignment and Closure Former MCAS El Toro 33000 Nixie Way, Bldg. 50, Floor 2 San Diego, CA 92147 elizabeth.a.roddy3.civ@us.navy.mil	Remedial Project Manager U.S. EPA Region 9, SFD-8-1 75 Hawthorne Street San Francisco, CA 94105 aycock.mary@epa.gov	Environmental Scientist/ Project Manager DTSC Site Mitigation and Restoration Program 5796 Corporate Ave. Cypress, CA 90630-4700 michelle.micucci@dtsc.ca.gov	Engineering Geologist RWQCB 3737 Main Street, Suite 500 Riverside, CA 92501-3348 patricia.hannon@waterboards.ca.gov

Glossary of Terms

Administrative Record (AR) File is a collection of reports and historical documents used in the selection of cleanup or environmental management activities.

Applicable or Relevant and Appropriate Requirements (ARARs) are the federal and state laws and regulations that must be followed for the selected cleanup remedy.

Background is defined as contamination that is not influenced by the site and may occur naturally (e.g., arsenic in soil and water) or is present in the environment as a result of human activities unrelated to the site.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), also known as Superfund, is a federal law that regulates environmental investigation and cleanup of sites identified as potentially posing a risk to human health and/or the environment.

Chemical of Concern is a chemical identified in a site-specific human health risk assessment as a potential risk driver or a chemical that exceeds its federal or state drinking water maximum contaminant level.

Exposure Point Concentration (EPC) is an estimation of the concentration of a chemical in the environment. The *EPC* is a conservative estimate of the average chemical concentration in an environmental medium.

Feasibility Study (FS) is a study that identifies and evaluates cleanup technologies for a site based on effectiveness, availability, cost, and other criteria.

Hazard Level is a numerical ranking (1 through 4, with 4 representing the lowest hazard) of hazard scores calculated based on the interaction between the current or future human activities on a munitions response site, and the types, amounts, and conditions of *MEC* items found at the site.

Hazard Quotient (HQ) is a measure of the potential noncancer health effect and is the ratio of a chemical's exposure concentration to the chemical's toxicity reference value.

Hazard Index (HI) is the summation of *HQs* for multiple chemicals. An *HI* value of 1 or less is considered protective of human health.

Human Health Risk Assessment (HHRA) is an analysis of the potentially adverse human health effects caused by potential exposure to hazardous substances released at a site.

Installation Restoration Program (IRP) is the Department of Defense's program to investigate and clean up environmental contamination at military facilities in full compliance with *CERCLA*.

Institutional Controls (ICs) are non-engineering mechanisms established to limit human exposure to contaminated soil, sediment, and/or groundwater.

Kick-outs are lightweight munitions or munition fragments that were ejected from the EOD Training Range.

Material Documented as Safe (MDAS) refers to munitions or munitions fragments that do not pose a potential hazard to receptors that come in contact with them. Often referred to as "inert munitions debris".

Munitions and Explosives of Concern (MEC) refers to munitions or munition fragments that pose a potential hazard to receptors that come in contact with them.

National Oil and Hazardous Substances Pollution Contingency Plan (NCP) describes the organizational structure and procedures to be followed by the federal government to prepare for and respond to discharges of oil and releases of hazardous substances, pollutants, and contaminants.

Petroleum Hydrocarbons are a family of several hundred chemical compounds in crude oil, such as benzene, hexane, toluene, and others.

Preliminary remediation goal (PRG) is the concentration of a contaminant that provides a reference point for establishing site-specific cleanup levels. A *PRG* may be based on federal or state drinking water standards or risk-based concentrations.

Preferred Alternative is the remedial alternative identified by the Navy in conjunction with the regulatory agencies that best satisfies the *RAOs* based on an evaluation of alternatives presented in the *FS*.

Proposed Plan is a document that reviews cleanup alternatives, summarizes recommended cleanup actions, explains the reasons for recommending them, and solicits comments from the community.

Record of Decision (ROD) is a public document that explains the selected remedial alternative to be implemented at a specific site. The *ROD* is based on information and technical analysis generated during the *RI*/*FS* and on consideration of public comments received throughout the process and in response to the *Proposed Plan*.

Remedial Action (RA) is a general term used to describe technologies used to contain, remove, or treat hazardous contaminants to protect human health and/or the environment.

Remedial Action Objectives (RAOs) are goals established for the protection of human health and the environment.

Remedial Investigation (RI) identifies the nature and extent of potential contaminants at a site and evaluates human health and environmental risks.

Resource Conservation and Recovery Act (RCRA) is a federal law that gives California EPA the authority to control hazardous waste from "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous wastes.

Semivolatile Organic Compound is an organic (carbon-containing) compound that has a boiling point higher than water and may vaporize when exposed to temperatures above room temperature.

Time-Critical Removal Action (TCRA) is an expedited action to remove contamination and/or hazards.

Volatile Organic Compounds (VOCs) make up a general category of organic (carbon-containing) compounds that evaporate easily at room temperature. *VOC*s are commonly used for degreasing, paint stripping, and other industrial operations.

Proposed Plan Comment Form

IRP Site 1 Soil Remedy

The public comment period for the *Proposed Plan* for the *IRP* Site 1 Soil Remedy, located at Former MCAS El Toro, Irvine, California, is from **March 7 to April 6, 2023.** A public meeting to present the *Proposed Plan* will be held at Irvine Civic Center, Room L-102, 1 Civic Center Plaza, Irvine, California, on **March 8, 2023 from 7:00 pm to 8:00 pm**. You may provide comments verbally at the public meeting, where all comments will be recorded by a court reporter. Alternatively, you may provide written comments in the space provided below or on your own stationery. All written comments must be postmarked no later than **April 6, 2023**. After completing your comments and providing your contact information, please mail this form to the address provided on the reverse side. You may also submit this form to a Navy representative at the public meeting. Comments are also being accepted by e-mail; please address e-mail messages to elizabeth.a.roddy3.civ@us.navy.mil.

Name: _____

Representing: (optional) _____

Phone Number: (optional) _____

Address: (optional) _____

Comments:

_____

_____

_____

_____

_____

_____

_____

_____

Ms. Elizabeth A. Roddy
BRAC Environmental Coordinator
Department of the Navy
BRAC Program Management Office West
33000 Nixie Way, Bldg. 50, Floor 2
San Diego, CA 92147-5101

Proposed Plan for Soil Remedial Action at Installation Restoration Program Site 1 Former Marine Corps Air Station El Toro Irvine, California

DCN: USAE-1812-4021-0079