



Naval Facilities Engineering Systems Command Southwest
San Diego, California

Final

Engineering Evaluation/Cost Analysis

Munitions Response Program Site 2
(Former Small Arms Range)

Naval Air Facility El Centro
El Centro, California

June 2021

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DCN: CH2M-9000-FZ08-0032

Prepared for:



Department of the Navy
Naval Facilities Engineering Systems Command Southwest
750 Pacific Highway
San Diego, CA 92132

Prepared by:



CH2M HILL, Inc.
San Diego, California

Contract Number: N62470-16-D-9000; Task Order No. FZ08



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Executive Summary

This report presents the Engineering Evaluation/Cost Analysis (EE/CA) for a Non-Time-Critical-Removal-Action (NTCRA) under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 for Munitions Response Program (MRP) Site 2 (former Small Arms Range), located at Naval Air Facility (NAF) El Centro in El Centro, California.

NAF El Centro is a 2,289-acre installation located in the Imperial Valley desert of southeastern California, south of the Salton Sea and approximately 11 miles north of the United States/Mexico border (Malcolm Pirnie, 2005). The installation, commissioned in 1942, is located in Imperial County approximately seven miles northwest of the City of El Centro and 85 miles east of San Diego (Malcolm Pirnie, 2005). The 2,289-acre installation includes the airfield runways and control tower, aircraft parking apron and hangars, auxiliary, administration, and storage buildings; ordnance storage areas; a wastewater treatment facility; barracks and family housing; and roads. The former Small Arms Range (MRP Site 2) is a 4-acre site located approximately 1 mile north of the NAF El Centro runways. The area is generally flat, with a gradual slope to the east/southeast towards a drainage swale. The elevation is approximately 50 feet below sea level. MRP Site 2 is located in an area that has been disturbed, with native habitat removed; however, desert scrub vegetation has re-established locally.

The Small Arms Range at MRP Site 2 was constructed in 1942, with 10 fixed firing positions and targets located at 10, 20, and 45 yards. The range at MRP Site 2 was used for small arms training through the 1980s. Weapons use was limited to primarily small caliber (.22-, .38-, and .45-caliber, and 9-millimeter) handguns. The backstop berm was approximately 15 feet high and 75 feet long and has been demolished, with soil from the berm stockpiled onsite. MRP Site 2 is not currently in use.

A Preliminary Assessment (PA) was completed in 2004 and a Site Inspection (SI) was conducted in 2008. Based on the PA and SI results, a remedial investigation (RI) was performed in 2018, which included collection and analysis of 50 composite samples for analysis of total lead, with most samples also analyzed for pH and total organic carbon and select samples analyzed to evaluate disposal options. The RI results (CH2M, 2019) indicate that the lateral and vertical extent of lead contamination within MRP Site 2 exceeding the Department of Toxic Substances Control (DTSC) residential and industrial screening levels is limited to the surface (0 to 0.5 foot below ground surface [bgs]) of an area near the firing line of the former Small Arms Range (sub-grid cell 1E west of SAR03) in the western portion of the site.

A human health risk assessment (HHRA) evaluated potential risks from exposure to chemicals of potential concern (COPCs) in soil from exposure areas for MRP Site 2: the MRP Site 2 Firing Fan and the MRP Site 2 Drainage Swales. Explosives residues detected in soil and metals detected above background threshold values for NAF El Centro at each exposure area were identified as COPCs. One explosives residue (cyclotrimethylenetrinitramine [RDX]) and three metals (antimony, copper, and lead) were identified as COPCs for the MRP Site 2 Firing Fan exposure area. Three metals (antimony, copper, and zinc) were identified as COPCs for the MRP Site 2 Drainage Swale exposure area. Cumulative carcinogenic risks (excluding lead) from exposure to surface and subsurface soils, at both the MRP Site 2 Firing Fan and the MRP Site 2 Drainage Swale exposure areas, are less than the DTSC point of departure for cancer risks of 1×10^{-6} for all human receptors evaluated. The cumulative noncancer hazard indexes (excluding lead) from exposure to surface and subsurface soils, at both the MRP Site 2 Firing

Fan and the MRP Site 2 Drainage Swale exposure areas, are less than the noncancer threshold level of 1 for all human receptors evaluated.

Lead was evaluated separately from cancer risks and noncancer hazards in the HHRA for each receptor at both exposure areas because of its unique toxicological properties. The exposure point concentration for lead in surface soil (117 milligrams per kilogram [mg/kg]) at the MRP Site 2 Firing Fan exposure area exceeds the DTSC residential screening criterion of 80 mg/kg but is below the DTSC industrial screening criterion of 320 mg/kg. Lead in surface soil (0 to 0.5 foot bgs) was identified as a chemical of concern for residential receptors at the MRP Site 2 Firing Fan exposure area. The estimated volume of lead-impacted soil exceeding the proposed residential risk-based cleanup goal of 80 mg/kg is 62 cubic yards. Lead was not evaluated in the HHRA for the MRP Site 2 Drainage Swale exposure area because concentrations of lead in soil samples from this area were less than the background threshold value for lead (27 mg/kg) and thus lead was not identified as a COPC for this exposure area.

The goals of the EE/CA are to identify the objectives of a potential removal action and analyze the effectiveness, implementability, and cost of various alternatives that may satisfy these objectives. The Removal Action Objective (RAO) for MRP Site 2 is to prevent exposure to surface soil containing lead at concentrations that exceed the cleanup goal and pose an unacceptable risk to future residents.

Three alternatives were developed for the RA at MRP Site 2 based on the RAO. The three alternatives were evaluated against the nine NCP criteria because the NTCRA is being conducted during the RI phase (Navy, 2018). This allows the EE/CA to meet Feasibility Study requirements in the CERCLA Process. A brief description of the alternatives and the results of the comparative analysis that was conducted, including the recommended alternative, in this EE/CA are as listed below:

- Alternative 1: No Action
- Alternative 2: Institutional Controls
- Alternative 3: Excavation and Offsite Disposal

Alternative 1 (No Action) does not meet the objectives of the NTCRA to mitigate risk to human health. As such, this alternative is not recommended.

Alternative 2 (Institutional Controls) achieves the RAO, complies with applicable or relevant and appropriate requirements (ARARs), and mitigates the onsite risks to human health through the implementation of institutional controls (ICs) that prevent residential development of the site. ICs are readily implementable and used in similar sites worldwide; however, because lead-impacted soil is left in place, ICs would be implemented in perpetuity and would not allow for unlimited use/unrestricted exposure (UU/UE).

Alternative 3 (Excavation and Offsite Disposal) achieves the RAO, complies with ARARs, and mitigates the onsite risks to human health and the environment through the removal of berm soil. Alternative 3 would be intended to achieve UU/UE. This alternative is straightforward to implement, utilizing conventional construction methods, and resources. Because Alternative 3 removes impacted surface and near surface soil, potential for exposure to lead is eliminated. Pending post-removal conditions, no further action status would be recommended for MRP Site 2. This alternative eliminates long-term maintenance and monitoring costs through the achievement of no further action.

Based on the comparative analysis of the alternatives provided in this EE/CA, the recommended RA is Alternative 3 – Excavation and Offsite Disposal.

Contents

Executive Summary.....	v
Acronyms and Abbreviations	ix
1.0 Introduction	1-1
1.1 Regulatory Background.....	1-1
1.2 Purpose and Objectives	1-2
2.0 Site Characterization	2-1
2.1 NAF El Centro Description and Operational History.....	2-1
2.2 Site Description and Background	2-2
2.2.1 Geology and Hydrogeology	2-2
2.2.2 Hydrology	2-3
2.2.3 Natural Resources.....	2-3
2.3 Land Use and Populations	2-4
2.4 Summary of Previous Investigations	2-4
2.4.1 Preliminary Assessment (Malcolm Pirnie, 2005)	2-4
2.4.2 Site Inspection (Battelle, 2009).....	2-5
2.4.3 Remedial Investigation (CH2M, 2019).....	2-5
2.5 Nature and Extent of Contamination	2-6
2.6 Risk Assessment Summary	2-6
2.6.1 Human Health Risk Assessment Results	2-7
2.6.2 Ecological Risk Assessment Results.....	2-8
2.7 Contamination Fate and Transport.....	2-9
3.0 Identification of Removal Action Objectives	3-1
3.1 Removal Action Requirements.....	3-1
3.2 Removal Action Scope and Objectives	3-1
3.3 Determination of Removal Action Schedule	3-1
3.4 Applicable or Relevant and Appropriate Requirements.....	3-2
3.4.1 Chemical-Specific ARARs	3-2
3.4.2 Location-Specific ARARs	3-3
3.4.3 Action-Specific ARARs	3-3
4.0 Identification and Analysis of Alternatives.....	4-1
4.1 Cleanup Goal and Estimated Volume of Impacted Soil.....	4-1
4.2 Description of Alternatives.....	4-1
4.2.1 Alternative 1 – No Action	4-1
4.2.2 Alternative 2 – Institutional Controls	4-1
4.2.3 Alternative 3 – Excavation and Offsite Disposal	4-2
4.3 Alternatives Evaluation Criteria	4-4
4.4 Evaluation of Alternatives.....	4-6
4.4.1 Alternative 1 – No Action	4-6
4.4.2 Alternative 2 – Institutional Controls	4-7
4.4.3 Alternative 3 – Excavation and Offsite Disposal	4-8
5.0 Comparative Analysis of Alternatives.....	5-1
5.1 Overall Protection of Human Health and the Environment.....	5-1
5.2 Compliance with ARARs	5-1

5.3	Long-Term Effectiveness and Permanence	5-1
5.4	Reduction of Toxicity, Mobility, or Volume through Treatment	5-1
5.5	Short-Term Effectiveness	5-1
5.6	Implementability	5-2
5.7	Cost.....	5-2
6.0	Recommended Alternative.....	6-1
7.0	References.....	7-1

Appendixes

A	Potential Applicable or Relevant and Appropriate Requirements.....	A-1
B	Cost Estimate.....	B-1
C	Sustainability Assessment	C-1
D	Response to Comments	D-1

Tables

2-1	Site Inspection Data Summary for MRP Site 2 - Metals.....	2-11
2-2	Remedial Investigation Data Summary for MRP Site 2 – Lead.....	2-17
2-3	Remedial Investigation Data Summary for MRP Site 2 – Geotechnical Sample Results	2-21
4-1	Summary of Detailed Analysis of Alternatives by Evaluation Criteria.....	4-11
4-2	Cost Estimate Summary for Alternative 2: Institutional Controls	4-15
4-3	Cost Estimate Summary for Alternative 3: Excavation and Offsite Disposal	4-17
5-1	Summary of Comparative Analysis of Alternatives	5-3

Figures

2-1	Facility Location Map	2-25
2-2	MRP Site 2 Layout	2-27
2-3	Sample Locations and Screening Level Exceedances – Lead.....	2-29
2-4	Results of Detector-aided Visual Reconnaissance	2-31
4-1	Removal Action Area	4-19

Acronyms and Abbreviations

§	Section (for laws and public codes)
95UCL	95 percent upper confidence limit
µg/L	microgram(s) per liter
AM	Action Memorandum
ARAR	applicable or relevant and appropriate requirement
bgs	below ground surface
BTV	background threshold value
Cal. Code Regs.	California Code of Regulations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
CH2M	CH2M HILL, Inc.
CLEAN	Comprehensive Long-term Environmental Action–Navy
COC	chemical of concern
COPC	chemical of potential concern
CRWQCB	Colorado River Basin Regional Water Quality Control Board
DTSC	Department of Toxic Substances Control
EO	Executive Order(s)
Eco-SSL	ecological soil screening level
EE/CA	Engineering Evaluation/Cost Analysis
EPC	exposure point concentration
ERA	ecological risk assessment
ESV	ecological screening value
FS	Feasibility Study
GHG	greenhouse gas
GSR	Green and Sustainable Remediation
HHRA	Human Health Risk Assessment
HI	hazard index
IC	Institutional Control
ID	identification
ITRC	Interstate Technology and Regulatory Council
J	analyte present, value may or may not be accurate or precise
LUC	land use control
MC	munitions constituents

MCAS	Marine Corps Air Station
mg/kg	milligram(s) per kilogram
mg/L	milligram(s) per liter
MRP	Munitions Response Program
N/A	not applicable
NA	not analyzed
NAF	Naval Air Facility
NAVFAC	Naval Facilities Engineering Command
Navy	Department of the Navy
NCP	National Oil and Hazardous Substance Pollution Contingency Plan
NOX	oxides of nitrogen
NTCRA	Non-Time-Critical-Removal-Action
O&M	operation and maintenance
OMB	Office of Management and Budget
PA	Preliminary Assessment
PM10	particulate matter with particle sizes of 10 microns or smaller in aerodynamic diameter
RA	removal action
RAO	Removal Action Objective
RDX	cyclotrimethylenetrinitramine
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RSL	regional screening level
SARA	Superfund Amendments and Reauthorization Act
SI	site investigation
SOX	oxides of sulfur
TCLP	Toxicity Characteristic Leaching Procedure
TDS	total dissolved solids
tit.	Title (for laws and public codes)
TOC	total organic carbon
U.S.C.	United States Code
USEPA	U.S. Environmental Protection Agency
UU/UE	unrestricted use/unlimited exposure
WP	Work Plan

1.0 Introduction

This report presents the Engineering Evaluation/Cost Analysis (EE/CA) for a non-time critical removal action (NTCRA) for Munitions Response Program (MRP) Site 2 (former Small Arms Range) at Naval Air Facility (NAF) El Centro in El Centro, California. This EE/CA report is prepared under the Department of the Navy (Navy), Naval Facilities Engineering Command (NAVFAC) Atlantic, Comprehensive Long-term Environmental Action–Navy (CLEAN) Contract N62470-16-D-9000, Contract Task Order FZ08, for submittal to NAVFAC Southwest and regulatory stakeholders.

1.1 Regulatory Background

This EE/CA will be used as the basis for a future Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) removal action (RA) and has been prepared in accordance with the requirements for NTCRAs under CERCLA and the Superfund Amendments and Reauthorization Act of 1986 (SARA). This document is issued by the Navy, the lead agency responsible for remediation at MRP Site 2, under Section (§) 104 of CERCLA (USEPA, 2006a). CERCLA § 104 of and SARA allows an authorized agency to take any appropriate RA to abate, prevent, minimize, stabilize, mitigate, or eliminate the release or threat of release relating to hazardous substances, pollutants, or contaminants at any time, or to take any other response measures consistent with the National Oil and Hazardous Substance Pollution Contingency Plan (NCP), as deemed necessary, to protect public health or welfare and the environment (USEPA, 2006b). A NTCRA is being pursued under 40 *Code of Federal Regulations* (CFR) Part 300.415(b)(2), which defines the right and responsibility of the lead agency to instigate an appropriate RA to mitigate or eliminate the threat posed to the public or the environment from a release. NTCRAs may constitute interim or final actions. In the case of MRP Site 2, the NTCRA is planned as a final action to mitigate potential unacceptable risks to future hypothetical residents based on exposure to lead in surface soils.

The lead agency is required by 40 CFR § 300.415(b)(4)(i) to conduct an EE/CA when a NTCRA is planned for a site. An EE/CA documents the alternatives and selection process. Where the extent of the contamination is well defined and limited, NTCRAs also allow for the expedited cleanup of sites in comparison to the remedial action process under CERCLA. Because the NTCRA is being conducted during the remedial investigation (RI) phase, the alternatives are evaluated against the nine NCP criteria (Navy, 2018). This allows the EE/CA to meet Feasibility Study (FS) requirements of the CERCLA Process. The Navy will prepare an Action Memorandum (AM) to document, for the Administrative Record, the Navy's decision to undertake the NTCRA at NAF El Centro MRP Site 2 (former Small Arms Range) per their authority to undertake CERCLA response actions under Title 42 of the United States Code (U.S.C.) § 9604, 10 U.S.C. § 2701 and federal Executive Orders (EOs) 12580 and 13016.

Community involvement requirements for NTCRAs include preparing an EE/CA and making it available for public review and comment for a period of 30 days. Announcement of the 30-day public comment period is required to be published in a local newspaper. Written responses to significant comments will be summarized in the AM and included in the Administrative Record for NAF El Centro.

Submittal of this document fulfills the requirements for NTCRAs defined by CERCLA, SARA, and the NCP. This EE/CA has been prepared in accordance with the United States Environmental Protection Agency's (USEPA's) Guidance on Conducting NTCRAs Under

CERCLA, PB93-963402 (August 1993). This document also summarizes the site conditions supporting the NTCRA.

1.2 Purpose and Objectives

The purpose of this EE/CA is to provide a framework for evaluating and selecting alternative technologies, along with satisfying environmental review and Administrative Record requirements. This EE/CA evaluates alternatives for MRP Site 2 based on technical feasibility, ability to protect human health and the environment, ability to prevent the potential release of hazardous constituents, implementability, and cost. The final objective of this EE/CA is to recommend an RA for MRP Site 2 based on the identification and comparative analysis of the alternatives.

The following information is presented within this EE/CA:

- **Section 2:** Site Characterization
- **Section 3:** Identification of Removal Action Objectives
- **Section 4:** Identification and Analysis of Alternatives
- **Section 5:** Comparative Analysis of Alternatives
- **Section 6:** Recommended Alternative
- **Section 7:** References
- **Appendix A:** Potential Applicable or Relevant and Appropriate Requirements
- **Appendix B:** Cost Estimate
- **Appendix C:** Sustainability Assessment
- **Appendix D:** Response to Agency Comments

2.0 Site Characterization

This section summarizes the site history and presents an evaluation of the physical characteristics pertaining to the surface and subsurface features, and a brief discussion of the ecological setting and potential human receptors for MRP Site 2. The physical characteristics are important to describe the primary mechanisms that control fate and migration of contaminants. In addition, this section provides a summary of previous investigations, the nature and extent of contamination, a summary of the human health and ecological risk assessment results, and the fate and transport of contamination. The information presented in this section establishes the basis for the NTCRA.

2.1 NAF El Centro Description and Operational History

NAF El Centro is a 2,289-acre installation located in the Imperial Valley desert of southeastern California, south of the Salton Sea and approximately 11 miles north of the United States/Mexico border (Malcolm Pirnie, 2005). The installation is located in Imperial County approximately seven miles northwest of the City of El Centro and 85 miles east of San Diego (Malcolm Pirnie, 2005). The 2,289-acre installation includes the airfield runways and control tower, aircraft parking apron and hangars, auxiliary, administration, and storage buildings; ordnance storage areas; a wastewater treatment facility; barracks and family housing; and roads. The location of NAF El Centro is shown on **Figure 2-1**.

The Imperial Valley is within the Colorado Desert geomorphic province of California and occupies the north-central part of the Salton Trough, a large topographic structural depression largely below sea level. The surficial deposits in the area of NAF El Centro consist of lacustrine sediments which are predominantly clays, sands, or a combination of sand-silt-clay mixtures. These lacustrine sediments are underlain by heterogeneous, nonmarine, sedimentary rock. In the northern portion of the installation, groundwater is generally present at depths of 10 to 20 feet below ground surface (bgs), but may be as shallow as 5 feet bgs. A deeper saturated zone is present at depths ranging from 40 to 50 feet bgs. The general direction of groundwater flow at NAF El Centro is northwest towards the New River; however, the depth and flow direction may be influenced locally by nearby agricultural irrigation. The climate at NAF El Centro is dry and arid, with hot summers and mild winters. Average annual precipitation ranges from 2.8 to 3.5 inches per year, of which about half falls during summer showers and half during gentle winter rains. The area is subject to mild prevailing westerly winds in the winter and spring. On windy days, velocities of 15 to 20 miles per hour are common, with some gusts exceeding 30 miles per hour. The lack of precipitation and arid climate results in high evaporation rates (Malcolm Pirnie, 2005). Evapotranspiration rates in El Centro ranged from 1.66 inches in December 2019 to 10.32 in July 2019 (CIMIS, 2020).

The historical installation use and designations for NAF El Centro were as follows:

- 1942 – The installation was commissioned as a Marine Corps Air Station (MCAS).
- 1945 – The Marine Corps Aerial Gunnery School was located at the MCAS.
- 1946 – The installation was commissioned by the Navy as a Naval Air Station.
- 1947-1949 – Naval Parachute Experimental Unit, Navy Air Technical Training Unit, and Fleet Air Gunnery Unit commenced operations at the Naval Air Station.
- 1951 – The Joint Air Force/Navy Parachute Test Facility was established.

- 1962 – The installation was designated as a NAF.
- 1964 – The Navy Aerospace Recovery Facility was commissioned.
- 1973 – The Navy Aerospace Recovery Facility was combined with the NAF to form the National Parachute Test Range.
- 1979 – The parachute test mission was transferred to Naval Weapons Center China Lake and the installation designated as NAF El Centro.

NAF El Centro currently provides facilities for tactical air training for active or reserve units from each of the major Department of Defense components and for units from other federal agencies. NAF El Centro does not have a permanently stationed aviation unit. NAF El Centro is the winter training location for the Navy's Blue Angels Flight Demonstration Squadron (Tierra Data, 2014). In addition to touch and go landings and take-offs, aircrews have used the training ranges and targets associated with NAF El Centro for bombing, rocketry, gunnery, strafing, and air combat training (Malcolm Pirnie, 2005).

2.2 Site Description and Background

The former Small Arms Range (MRP Site 2) is a 4-acre site located approximately 1 mile north of the NAF El Centro runways, north and east of Patrol Road, adjacent to the northern installation boundary (**Figure 2-2**). The area is generally flat, with a gradual slope to the east/southeast toward a drainage swale. The elevation is approximately 50 feet below sea level. MRP Site 2 is located in an area that has been disturbed, with native habitat removed; however, desert scrub vegetation has re-established locally. North of the site is an unpaved, unnamed road and fencing that demarcates the installation boundary. A drainage swale is located southwest of the site. West of the site is desert scrub vegetation. To the east (past the installation boundaries) is an agricultural field.

The Small Arms Range at MRP Site 2 was constructed in 1942, with 10 fixed firing positions and targets located at 10, 20, and 45 yards. The former site configuration is shown on **Figure 2-2**. The range was oriented in a west to east direction, with the firing points located on the westernmost portion of the range. The former range was used for small arms training and periodic re-qualification training through the 1980s. Weapons use was limited to primarily small caliber (.22-, .38-, and .45-caliber, and 9-millimeter) handguns. The backstop berm was located in the central portion of MRP Site 2 and was approximately 15 feet high and 75 feet long. It was demolished and the soil from the berm was stockpiled on the central portion of the site (**Figure 2-3**). MRP Site 2 is not currently in use. Concrete and metal debris from a former structure (Building 162) were observed on the site during the PA (Malcolm Pirnie, 2005).

2.2.1 Geology and Hydrogeology

Soil observed at MRP Site 2 consists of mostly silt and sand with few observations of clay-like properties. Soil behavior and characteristics change consistently at depth with sandier material residing at the surface and tougher silts and some clay material residing at approximately 3 feet bgs.

The depth to groundwater and direction of groundwater flow at MRP Site 2 are locally influenced by nearby irrigated fields, drainage ditches, subsurface drains, and natural channels (Malcolm Pirnie, 2005). Groundwater in the vicinity of MRP Site 2 was reported during the PA to be encountered at 10 to 20 feet bgs but may be as shallow as 5 feet bgs (Malcolm Pirnie, 2005). The RI conducted at MRP Site 2 included soil borings down to 3.5 feet bgs. Groundwater was

not encountered during the investigation activities of the RI. A deeper saturated zone is present at depths between 40 and 50 feet bgs (Malcolm Pirnie, 2005). The general direction of groundwater flow at NAF El Centro is northwest toward the New River. Groundwater sources in the vicinity of NAF El Centro (within the Imperial hydrologic unit) have been designated as having municipal and industrial uses, and as suitable, or potentially suitable, for municipal or domestic water supply (CRWQCB, 2014). The actual municipal usage of the Imperial hydrologic unit is limited only to a small portion of that groundwater unit (CRWQCB, 2014). Exceptions to beneficial use include groundwater with total dissolved solids (TDS) concentrations exceeding 3,000 milligrams per liter (mg/L) (or specific conductance values exceeding 5,000 micromhos per centimeter), and groundwater that is not reasonably expected by the Colorado River Basin Regional Water Quality Control Board (CRWQCB) to supply a public water system (CRWQCB, 2014). The upper aquifer at NAF El Centro is characterized as having high TDS (commonly exceeds 3,000 mg/L), chloride, and sulfate concentrations (SWES, 2012) and low aquifer yields (CRWQCB, 1998). Shallow groundwater beneath NAF El Centro is of poor quality (TDS commonly exceeds 3,000 mg/L). Groundwater from other areas at NAF El Centro generally do not meet the criteria for municipal beneficial use given the level of TDS. Therefore, shallow groundwater beneath MRP Site 4 may be unsuitable for municipal use. Although some industrial uses may be applicable, none are presently known to exist or are planned to be implemented. Impacts to groundwater from MRP Site 2 are not anticipated because of limited soil vertical migration of the chemicals of potential concern (COPCs), low precipitation, high evaporation, and site soil characteristics (neutral pH and high total organic carbon [TOC] content) (**Section 2.7**).

2.2.2 Hydrology

There are no natural surface water bodies at MRP Site 2. Surface water in the vicinity of NAF El Centro typically is conveyed by canals and irrigation ditches. The Imperial Irrigation District's Elm Canal and Elder Canal border the installation to the east and west, respectively. Excess irrigation water from nearby fields and unlined canals is the main source of groundwater recharge. Because of the arid climate, the recharge contribution from precipitation is minimal. Runoff at MRP Site 2 flows overland east to southeast toward a drainage swale. During periods of heavy rainfall at the installation, stormwater runoff collected by the drainage swales is discharged to the New River (located approximately 1 mile west of the range along the installation's northwestern boundary). Given the infrequent nature of precipitation events and the high rate of evaporation and infiltration in the area, it is unlikely that surface water from MRP Site 2 will reach the New River. As a result, impacts to surface water and sediment are not anticipated (CH2M, 2019).

2.2.3 Natural Resources

Because almost all of the installation has been graded or disturbed at one time, there are no areas remaining that are considered natural resources. MRP Site 2 has very limited desert scrub vegetation, but does include native species, such as creosote bush and burro bush, and non-native invasive species, such as Russian thistle (commonly referred to as tumbleweed) (Malcolm Pirnie, 2005). Former agricultural fields are located north and east of the former range. These agricultural fields have been taken out of production and the Navy is no longer leasing them out for agricultural activities (as of October 15, 2017), with no plans to lease them out in the future (CH2M, 2019). No federally listed plant species are known to occur on NAF El Centro or its target areas (Tierra Data, 2014).

Common upland wildlife species found near NAF El Centro include the gopher snake, sideblotched lizard, western whiptail, mourning dove, burrowing owl, western meadowlark, redwinged blackbird, American coot, ring-billed gull, American kestrel, cattle egret, great blue heron, deer mouse, desert cottontail, round-tailed ground squirrel, and coyote (Malcolm Pirnie, 2005). Federally threatened and/or endangered species that have the potential to occur in the general vicinity of the installation are the southwestern willow flycatcher, Yuma clapper rail, and desert tortoise, but only the desert tortoise has the potential to occur specifically at MRP Site 2 because existing habitat is only suitable for this species (Malcolm Pirnie, 2005). No threatened and endangered species have been documented at NAF El Centro (Tierra Data, 2014). The flat-tailed horned lizard and the western burrowing owl, which are special-status wildlife, also have the potential to occur at NAF El Centro. However, habitat for the flat-tailed horned lizard does not exist at the site. The western burrowing owl is a bird of conservation concern and a California Species of Special Concern and was observed near MRP Site 2 during the RI (CH2M, 2019).

2.3 Land Use and Populations

The former Small Arms Range (MRP Site 2) falls within the Explosives Safety Arc of nearby active storage magazines and there are currently no future land uses designated for the 4-acre property. NAF El Centro is secured by a perimeter fence and installation access is restricted to Navy personnel, authorized civilian personnel, authorized contractors, and escorted/authorized visitors. MRP Site 2 is located within the secured perimeter of NAF El Centro but is not fenced separately. Security patrols are conducted throughout the installation several times per day.

Located in a rural part of Imperial County, the area surrounding NAF El Centro is primarily used for agricultural purposes, with some residential use. According to 2018 U.S. Census Bureau statistics, Imperial County encompasses 4,176.6 square miles, has a population density of approximately 43.5 people per square mile, and a reported population of 181,827.

2.4 Summary of Previous Investigations

The following sections summarize the previous investigations conducted at MRP Site 2.

2.4.1 Preliminary Assessment (Malcolm Pirnie, 2005)

A PA was completed at MRP Site 2 in 2004. The site boundary for the 4-acre Small Arms Range (MRP Site 2) was confirmed to encompass the firing line, range floor, target areas, former backstop berm location, and stockpiled soil from the backstop berm. The site includes the area where bullets and bullet fragments were observed. In addition, parts of the surface danger zone were included in the site boundary to incorporate areas where ricochets may have occurred (**Figure 2-2**).

Observations during the visual survey identified numerous lead bullets and bullet fragments in the backstop berm soil stockpile, concrete and metal debris from a former structure (Building 162) near the southern portion of the site (**Figure 2-2**), and desert scrub vegetation re-establishment over a majority of the former range. Based on the PA research and visual survey, it was concluded that only small arms ammunition was used at the site and there is no potential for the presence of munitions and explosives of concern. In addition, special consideration munition types (i.e., chemical warfare materiel-filled munitions, electrically fuzed munitions, and/or depleted uranium associated munitions) were defined as 'not known nor suspected to have been used at the site.'

Based on the information obtained during the PA research, the stockpiled soil from the backstop berm was determined to be a potential source of munitions constituents (MC) contamination. This MC could include lead and other constituents associated with the type of ammunition used, and may be present in the stockpiled soil, surface soil adjacent to the stockpile, former berm location, and near the former firing line.

2.4.2 Site Inspection (Battelle, 2009)

A Site Inspection (SI) was conducted at MRP Site 2 in 2008. A total of 50 soil samples were collected: 36 composite samples from 18 grid cells (sized 25- by 25-meter) overlaying the site, 6 composite samples from 6 locations within the backstop berm stockpile, 4 composite samples from 2 locations outside the boundary but within the firing fan, and 4 composite samples from 2 locations within the drainage swales to the southeast of the site. Five-point composite soil samples were collected from each location, at depths of 0 to 0.5 and 1 to 2 feet bgs.

Soil samples were analyzed for metals (antimony, arsenic, copper, lead, and zinc) and explosives residues. Lead was detected at concentrations exceeding the 150 milligrams per kilogram (mg/kg) project action limit established during the SI in the shallow samples from grid cells SAR03 (205 mg/kg) and SAR10 (152 mg/kg). No other metals were detected at concentrations exceeding their respective project action limits in any of the other samples collected at MRP Site 2. The explosives residue cyclotrimethylenetrinitramine (RDX) was detected in a sample collected from the backstop berm stockpile at an estimated concentration of 0.19J mg/kg, well below the project action limit of 4.4 mg/kg. Explosives residues were not detected in any of the other soil samples collected at MRP Site 2. The SI concluded that lead contamination in soil is not a widespread problem at MRP Site 2. However, because lead bullets and bullet fragments were observed throughout the exposed portions of the backstop berm soil stockpile, further action to address the lead debris was recommended.

A summary of metals results from the SI at MRP Site 2 are presented in **Table 2-1**.

2.4.3 Remedial Investigation (CH2M, 2019)

An RI was conducted at MRP Site 2 in 2018. The RI consisted of implementing the Interstate Technology and Regulatory Council (ITRC) (2003) sampling methodology to further delineate the nature and extent of MC at MRP Site 2. This consisted of the collection of five-point composite soil samples from multiple depths in selected areas. The same grid overlay used during the SI was carried forward for the RI. SI grid cells where concentrations of MC were detected above current human health soil screening criteria were further refined by sub-dividing the SI grid cells into quadrants, resulting in 12.5- by 12.5-meter sub-grid cells at MRP Site 2. To define the lateral extent of MC detected during the SI where no samples were previously collected, step-out sub-grid cells of the same dimensions were established as needed. Within each sub-grid cell, soil was collected from depth intervals of 0 to 0.5, 1 to 1.5, 2 to 2.5, and 3 to 3.5 feet bgs. If preliminary data and professional judgment suggested the need for further investigation to better define the extent of contamination, properly assess risk based on the Conceptual Site Model, or evaluate potential response actions, additional samples were collected from step-out sub-grid cells using the same methodology. To assess the lateral extent of ammunition debris in soil from the demolished backstop berm and throughout the site, a detector-aided (i.e., White's Spectrum XLT) visual reconnaissance was conducted.

A total of 50 composite samples were collected from sub-grid cells. Additionally, four composite samples were collected from the surface of the backstop berm stockpile. All samples were analyzed for lead. Most samples were also analyzed for pH and TOC to evaluate the fate and

transport of site contaminants. In addition, selected samples were analyzed for grain size to assess an excavation, sifting, and offsite disposal remedial alternative during a future response action. Selected samples were analyzed via the toxicity characteristic leaching procedure (TCLP) for lead to assist in development of remedial alternatives, including soil treatability and offsite disposal (if needed).

Eleven soil samples contained lead concentrations that exceeded the installation-specific background threshold value (BTV) for lead (27 mg/kg). Of these 11 samples, only the surface soil sample result for lead in sub-grid cell 1E exceeded the Department of Toxic Substances Control (DTSC) (DTSC, 2018) residential screening criterion of 80 mg/kg and industrial screening criterion of 320 mg/kg. All samples for lead that exceeded the BTV were detected within and around the firing line. All samples collected from the surface of the soil stockpile contained lead below the BTV and DTSC residential and industrial screening criteria. Lead was detected at concentrations exceeding the ecological soil screening level (Eco-SSL) of 11 mg/kg throughout MRP Site 2 (CH2M, 2019).

Soil within MRP Site 2 is generally neutral with pH ranging from 6.20 to 7.84 (average of 7.27). TOC results ranged from 1,000 mg/kg to 10,000 mg/kg (average of approximately 4,500 mg/kg). Eight soil samples from MRP Site 2 (four from the surface and four from the soil stockpile) were also analyzed via TCLP for lead only; the maximum leachate concentration (18.7 micrograms per liter [µg/L]) was below the maximum concentration of contaminants for the toxicity characteristic (5,000 µg/L).

A summary of lead results from the RI at MRP Site 2 are presented in **Table 2-2**. A summary of pH, TOC, and TCLP results at MRP Site 2 are presented in **Table 2-3**.

2.5 Nature and Extent of Contamination

The lateral and vertical extent of lead contamination within MRP Site 2 is limited to the surface (0 to 0.5 foot bgs) of an area near the firing line of the former Small Arms Range (sub-grid cell 1E west of SAR03) in the western portion of the MRP Site 2 (**Figure 2-3**). Lead concentrations decrease with depth and are generally less than the lead BTV below 2.5 feet bgs within and around SAR03. Lead was not detected in the soil stockpile at concentrations exceeding screening levels. The lateral and vertical extent of lead at MRP Site 2 is presented on **Figure 2-3**.

Based on the results of a detector-aided visual reconnaissance conducted during the RI, small arms ammunition debris is present on the surface and/or unknown metallic items are present in the subsurface across most of MRP Site 2, bound to the east by the drainage swale running north to south across the site (**Figure 2-4**). The areas beyond the site boundaries to the west, north, and south of MRP Site 2 were not surveyed; therefore, the lateral extent of metal debris in these directions has not been determined. However, MRP Site 2 boundaries include the area where bullet and bullet fragments were observed during the PA.

2.6 Risk Assessment Summary

This section summarizes the results of the human health risk assessment (HHRA) and ecological risk assessment (ERA) presented in the RI Report for MRP Site 2 (CH2M, 2019). Data collected during the SI and RI were evaluated in the HHRA and ERA. The primary objective of the risk assessments was to estimate potential site-related chemical risks that may pose a threat to human health, the environment, or both.

2.6.1 Human Health Risk Assessment Results

Based on the sources and distribution of chemicals at MRP Site 2, the HHRA evaluated potential risks from exposure to COPCs in soil from two exposure areas for MRP Site 2: the MRP Site 2 Firing Fan and the MRP Site 2 Drainage Swales. Explosive residues detected in soil and metals detected above BTVs for NAF El Centro at each exposure area were identified as COPCs.

- **MRP Site 2 Firing Fan** – the area within the MRP Site 2 boundary, the RI step-out sampling grid area immediately adjacent to the western boundary of the site, and the sampling areas outside and to the east of the site boundary but within the surface danger zone (**Figure 2-3**). One explosives residue (RDX) and three metals (antimony, copper, and lead) were identified as COPCs for the MRP Site 2 Firing Fan exposure area.
- **MRP Site 2 Drainage Swale** – the area along the drainage swale southeast of the site, outside of the MRP Site 2 boundary, where four SI samples were collected (**Figure 2-3**). Three metals (antimony, copper, and zinc) were identified as COPCs for the MRP Site 2 Drainage Swale exposure area.

For each exposure area, future industrial workers (including maintenance workers), future construction workers, and hypothetical future residents were evaluated for potential exposure to COPCs in surface soil (0 to 0.5 foot bgs) and subsurface soil (0 to 3.5 feet bgs). Potentially complete surface and subsurface soil exposure pathways evaluated were incidental ingestion, dermal contact, and inhalation of particulate chemicals released from surface and subsurface soil to outdoor air from wind erosion. The concentration of each COPC that receptors may be exposed to in surface soil and subsurface soil is the exposure point concentration (EPC). The 95 percent upper confidence limit (95UCL) of the arithmetic mean was used as the EPC for each COPC unless the 95UCL exceeded the maximum detected concentration or the number of detected results was not sufficient for calculation of a 95UCL; in these cases, the maximum detection was used as the EPC.

Cancer risks are estimates of the incremental probability that an individual will develop cancer over a lifetime as a direct result of an exposure. USEPA's established range for management of residual cancer risks (1×10^{-6} to 1×10^{-4}), referred to as the risk management range, is used by risk managers to determine whether site risks are significant enough to warrant cleanup. The lower end of the range (1×10^{-6}) is DTSC's point of departure for cancer risks. Risks that do not exceed DTSC's point of departure of 1×10^{-6} are considered negligible and do not require action. When risk is between 1×10^{-6} and 1×10^{-4} , the Navy, in consultation with the support agencies, decides about the need for remedial action based on site-specific factors. Risks that exceed 1×10^{-4} , the upper end of the risk management range, presumptively require remedial action to minimize risk.

A Hazard Index (HI) is an estimate of the potential for adverse health effects other than cancer. An HI at or below 1 is considered an acceptable exposure level for noncancer health hazards and does not warrant a remedial action. An HI greater than 1 indicates that the estimated dose exceeds a threshold level that is considered safe, and noncancer health effects cannot be ruled out. HIs above 1 may require action.

The HHRA evaluated the potential for health effects from exposure to lead by comparing the EPC for lead in surface and subsurface soil with the DTSC (2018) screening criterion for lead (80 mg/kg for residential exposure and 320 mg/kg for industrial exposure). The screening criteria for lead are based on a biomarker (blood lead levels); for this reason, the risks from

exposure to lead were characterized separately and were not included in cumulative risk calculations.

At both the MRP Site 2 Firing Fan and the MRP Site 2 Drainage Swale exposure areas, the cumulative carcinogenic risks from exposure to surface and subsurface soils are less than 1×10^{-6} for all receptors evaluated. At both the MRP Site 2 Firing Fan and the MRP Site 2 Drainage Swale exposure areas, cumulative noncancer HIs from exposure to surface and subsurface soils are less than 1 for all receptors.

The EPC for lead in surface soil (117 mg/kg) at the MRP Site 2 Firing Fan exposure area exceeds the DTSC residential screening criterion of 80 mg/kg but is below the industrial criterion of 320 mg/kg. The EPC for lead in subsurface soil (61.3 mg/kg) is below the DTSC residential and industrial screening criteria. Based on these results, lead in surface soil (0 to 0.5 foot bgs) was identified as a chemical of concern (COC) for residential receptors at the MRP Site 2 Firing Fan exposure area.

The number of samples for lead at the MRP Site 2 Firing Fan exposure area that exceed the DTSC residential screening criterion of 80 mg/kg is limited to one sample in surface soil (744 mg/kg, detected at step-out sub-grid cell 1E near the firing line for the former Small Arms Range [Figure 2-3]). Lead in surface soil was identified as a COC for the hypothetical future resident. Although the result at this location also exceeds the industrial criterion of 320 mg/kg, no other results in surface or subsurface soil exceeded residential or industrial criteria, and the calculated 95UCL-based EPC for lead in surface soil is less than the industrial criterion. Therefore, lead in surface soil was not identified as a COC for the future industrial worker.

Lead was not evaluated in the HHRA for the MRP Site 2 Drainage Swale exposure area because concentrations were less than the BTV.

The HHRA recommended preparing an FS or an EE/CA to identify and evaluate remedial or RA alternatives to address lead in soil that may pose unacceptable risk to hypothetical future residents.

2.6.2 Ecological Risk Assessment Results

Risks were evaluated for plants, soil invertebrates, and terrestrial birds and mammals. These estimates were conducted under the hypothetical assumption that soil at MRP Site 2 is readily accessible for exposure by these receptors. Potential risks to terrestrial birds and mammals were estimated using the dosage-based food-chain uptake model and No Effect and Low Effect toxicity reference values to derive ecological screening values (ESVs). Soil concentrations were compared with ESVs to derive ecological hazard quotients.

No Effect ESVs are most relevant for assessing potential risks to threatened and endangered species. Given that no threatened and endangered species have been documented at NAF El Centro (Tierra Data, 2014), the results using the Low Effect ESVs are considered most appropriate for assessing the receptor populations and communities for nonthreatened and nonendangered species.

The results of this ERA indicate that concentrations of chemicals of potential ecological concern found in MRP Site 2 soil (surface and subsurface) during the SI and RI sampling are below levels that would be expected to pose ecological risk (as indicated by the Low Effect ESVs) to wildlife receptor populations and communities that may use that site.

2.7 Contamination Fate and Transport

Soil and the soil stockpile at MRP Site 2 are generally neutral and with high soil organic matter. At near neutral or higher soil pH ($6.5 < \text{pH} < 11$, neutral to basic conditions) lead tends to bind to soil media, its solubility is very low and therefore it is less likely to migrate. Lead is also known to sorb to and be retained by soil organic matter (ITRC, 2003). Given the pH and TOC results from soil samples at MRP Site 2, lead is considered immobile and potential migration through surface runoff, erosion, or leaching to groundwater is unlikely. TCLP results from the RI also suggest that lead is tightly bound to soil at MRP Site 2 and migration of lead through soil leaching or surface water runoff is unlikely.

Ammunition debris present at MRP Site 2 is dated up to approximately 77 years at the time of the RI. Results from soil characterization, fate and transport, and risk assessment (**Section 2.6**) indicate ammunition debris has not resulted in concentrations of ammunition-related metals (antimony, arsenic, copper, lead, and zinc) that are a concern for human health or the environment, and that this is unlikely to change in the future.

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Table 2-1. Site Inspection Data Summary for MRP Site 2 - Metals

					Antimony	Arsenic	Copper	Lead	Zinc
SI Project Action Limit^a (mg/kg)					31	6.3	3,100	150	23,000
Background Level^b (mg/kg)					0.025	11	25	27	90
USEPA Eco-SSL^c (mg/kg)					0.27	18	28	11	46
Residential Human Health Screening Level^d (mg/kg)					31	0.11	3,100	80	23,000
Industrial Human Health Screening Level^d (mg/kg)					470	0.36	47,000	320	350,000
SI Grid Cell ID	Location ID	Sample ID ^e	Sample Date	Sample Depth ^f (feet bgs)	Result (mg/kg)				
SAR01	SAR01	SAR01-Comp-S	08/03/08	0 – 0.5	0.22 J	3.35	17.1	17.2	52.5
		SAR01-Comp-D	08/04/08	1 – 2	0.22 J	4.58	21.7	16.4	69.7
SAR02	SAR02	SAR02-Comp-S	08/03/08	0 – 0.5	0.24 J	4.71	20.6	30.1	64.1
		SAR02-Comp-D	08/04/08	1.5 – 2	0.22 J	4.68	21.8	22.7	67.4
SAR03	SAR03	SAR03-Comp-S	08/03/08	0 – 0.5	0.25 J	5.62	24.3	205.0 ^g	77.6
		SAR03-Comp-D	08/04/08	1.5 – 2	0.25 J	5.75	24.5	75.7	78.2
SAR04	SAR04	SAR04-Comp-S	08/03/08	0 – 0.5	0.31 J	4.85	19.6	21.2	59.5
		SAR04-Comp-D	08/04/08	1.5 – 2	0.29 J	5.21	20.5	15.7	63.6
SAR05	SAR05	SAR05-Comp-S	08/03/08	0 – 0.5	0.28 J	4.41	22.1	33.8	59.0
		SAR05-Comp-D	08/04/08	1.5 – 2	0.24 J	5.56	22.3	16.9	64.2
SAR06	SAR06	SAR06-Comp-S	08/03/08	0 – 0.5	0.24 J	5.11	22.0	20.4	63.5
		SAR06-Comp-D	08/04/08	1.5 – 2	0.27 J	4.99	21.4	29.4	61.0
SAR07	SAR07	SAR07-Comp-S	08/03/08	0 – 0.5	0.49 J	5.15	21.6	20.1	66.6
		SAR07-Comp-D	08/04/08	1 – 2	0.25 J	5.02	19.9	21.1	61.3

Table 2-1. Site Inspection Data Summary for MRP Site 2 - Metals

					Antimony	Arsenic	Copper	Lead	Zinc
SI Project Action Limit^a (mg/kg)					31	6.3	3,100	150	23,000
Background Level^b (mg/kg)					0.025	11	25	27	90
USEPA Eco-SSL^c (mg/kg)					0.27	18	28	11	46
Residential Human Health Screening Level^d (mg/kg)					31	0.11	3,100	80	23,000
Industrial Human Health Screening Level^d (mg/kg)					470	0.36	47,000	320	350,000
SI Grid Cell ID	Location ID	Sample ID ^e	Sample Date	Sample Depth ^f (feet bgs)	Result (mg/kg)				
SAR08	SAR08	SAR08-Comp-S	08/03/08	0 – 0.5	0.22 J	3.72	17.2	13.7	56.6
		SAR08-Comp-D	08/03/08	1 – 2	0.22 J	4.18	19.0	12.9	58.7
SAR09	SAR09	SAR09-Comp-S	08/03/08	0 – 0.5	0.26 J	5.42	23.0	17.0	68.9
		SAR09-Comp-D	08/03/08	1 – 2	0.27 J	5.31	23.3	16.8	68.9
SAR10	SAR10	SAR10-Comp-S	08/02/08	0 – 0.5	0.39 J	5.01	21.9	152.0 ^g	62.3
		SAR10-Comp-D	08/03/08	1 – 2	0.26 J	5.26	25.0	17.1	65.8
SAR11	SAR11	SAR11-Comp-S	08/02/08	0 – 0.5	0.67 J	4.36	30.0	26.5	76.3
		SAR11-Comp-D	08/03/08	1 – 2	0.32 J	4.62	21.2	17.9	62.0
SAR12	SAR12	SAR12-Comp-S	08/02/08	0 – 0.5	0.30 J	4.82	20.6	28.0	58.1
		SAR12-Comp-D	08/04/08	1.5 – 2	0.28 J	4.80	20.0	19.0	58.6
SAR13	SAR13	SAR13-Comp-S	08/03/08	0 – 0.5	0.28 J	4.37	19.7	15.1	58.0 J
		SAR13-Comp-D	08/03/08	1 – 2	0.30 J	4.31	19.7	17.1	56.1 J
SAR14	SAR14	SAR14-Comp-S	08/03/08	0 – 0.5	0.37 J	4.83	22.3	20.4	66.5 J
		SAR14-Comp-D	08/03/08	1 – 2	0.31 J	4.94	22.5	18.1	67.6 J

Table 2-1. Site Inspection Data Summary for MRP Site 2 - Metals

					Antimony	Arsenic	Copper	Lead	Zinc
SI Project Action Limit^a (mg/kg)					31	6.3	3,100	150	23,000
Background Level^b (mg/kg)					0.025	11	25	27	90
USEPA Eco-SSL^c (mg/kg)					0.27	18	28	11	46
Residential Human Health Screening Level^d (mg/kg)					31	0.11	3,100	80	23,000
Industrial Human Health Screening Level^d (mg/kg)					470	0.36	47,000	320	350,000
SI Grid Cell ID	Location ID	Sample ID ^e	Sample Date	Sample Depth ^f (feet bgs)	Result (mg/kg)				
SAR15	SAR15	SAR15-Comp-S	08/03/08	0 – 0.5	0.28 J	5.14	21.6	14.7	63.1
		SAR15-Comp-D	08/03/08	1 – 2	0.28 J	4.55	21.2	15.3	60.2
SAR16	SAR16	SAR16-Comp-S	08/02/08	0 – 0.5	0.30 J	4.88	22.1	15.2	63.4 J
		SAR16-Comp-D	08/03/08	1 – 2	0.32 J	5.09	23.0	15.8	67.4 J
SAR17	SAR17	SAR17-Comp-S	08/02/08	0 – 0.5	0.25 J	4.94	20.7	17.6	60.8 J
		SAR17-Comp-D	08/03/08	1 – 2	0.27 J	4.74	21.9	15.0	64.3 J
SAR18	SAR18	SAR18-Comp-S	08/02/08	0 – 0.5	0.24 J	4.92	22.7	15.8	65.0
		SAR18-Comp-D	08/03/08	1 – 2	0.26 J	4.82	21.8	17.2	66.8
Backstop Berm	BBSAR01	BBSAR01-Comp	08/06/08	0 – 0.5	0.19 J	4.60	24.8	19.7	64.8
	BBSAR02	BBSAR02-Comp	08/06/08	0 – 0.5	0.19 J	5.02	22.3	22.0	76.1
	BBSAR03	BBSAR03-Comp	08/06/08	0 – 0.5	0.13 J	3.43	13.5	13.3	43.4
	BBSAR04	BBSAR04-Comp	08/06/08	0 – 0.5	0.18 J	4.87	20.8	32.4	60.0
	BBSAR05	BBSAR05-Comp	08/06/08	0 – 0.5	0.18 J	4.37	21.7	24.8	66.0
	BBSAR06	BBSAR06-Comp	08/06/08	0 – 0.5	0.19 J	5.20	19.9	66.0	64.1

Table 2-1. Site Inspection Data Summary for MRP Site 2 - Metals

					Antimony	Arsenic	Copper	Lead	Zinc
SI Project Action Limit^a (mg/kg)					31	6.3	3,100	150	23,000
Background Level^b (mg/kg)					0.025	11	25	27	90
USEPA Eco-SSL^c (mg/kg)					0.27	18	28	11	46
Residential Human Health Screening Level^d (mg/kg)					31	0.11	3,100	80	23,000
Industrial Human Health Screening Level^d (mg/kg)					470	0.36	47,000	320	350,000
SI Grid Cell ID	Location ID	Sample ID ^e	Sample Date	Sample Depth ^f (feet bgs)	Result (mg/kg)				
Drainage Swale	DSSAR01	DSSAR01-Comp	08/04/08	0 – 0.5	0.29 J	3.64	18.3	16.1	56.9 J
	DSSAR02	DSSAR02-Comp	08/04/08	0 – 0.5	0.34 J	3.79	22.4	17.9	130.0 J
	DSSAR03	DSSAR03-Comp	08/02/08	0 – 0.5	0.37 J	4.92	20.6	17.0	68.0 J
	DSSAR04	DSSAR04-Comp	08/02/08	0 – 0.5	0.35 J	4.22	26.0	18.4	83.6 J
Offsite	OBSAR01	OBSAR01-Comp-S	08/02/08	0 – 0.5	0.21 J	5.24	18.8	11.5	56.1
		OBSAR01-Comp-D	08/04/08	1.5 – 2	0.21 J	5.70	22.4	13.8	66.5
Offsite	OBSAR02	OBSAR02-Comp-S	08/02/08	0 – 0.5	0.21 J	5.40	20.0	11.5	55.4
		OBSAR02-Comp-D	08/04/08	1.5 – 2	0.24 J	6.09	23.6	15.0	71.5

^a Most conservative between USEPA Region IX and California-Modified Residential preliminary remediation goals at the time of the SI (USEPA, 2004a) and installation-wide BTVs (BNI, 1998). Exceedances are noted with a "g" superscript, if present.

^b Background concentrations from Final Soil Background Concentration Study Report (SWES, 2013)

^c The most conservative of the plants, soil invertebrates, avian, and mammalian USEPA Eco-SSLs (USEPA, 2008)

^d The most conservative value between the USEPA RSLs (USEPA, 2018a) and the DTSC Note 3 values (DTSC, 2018), where available.

^e Soil samples are 5-point composite collected within the SI Grid from the same depth interval.

^f Depths inferred from the SI Report (Battelle, 2009).

^g Exceeds the SI Project Action Limit

Notes:

Shaded concentrations exceed the background level (SWES, 2013) and the USEPA Eco-SSL (USEPA, 2008).

Green concentrations exceed the background level (SWES, 2013) and the DTSC Note 3 residential value (DTSC, 2018)

Red concentrations exceed the background level (SWES, 2013) and the DTSC Note 3 industrial value (DTSC, 2018)

ID = identification

J = analyte present, value may or may not be accurate or precise

RSL = regional screening level

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Table 2-2. Remedial Investigation Data Summary for MRP Site 2 – Lead

						Lead
Background Level^a (mg/kg)						27
USEPA Eco-SSL^b (mg/kg)						11
Residential Human Health Screening Level^c (mg/kg)						80
Industrial Human Health Screening Level^c (mg/kg)						320
SI Grid Cell ID	RI Sub-Grid Cell ID	Station ID	Sample ID^d	Sample Date	Sample Depth (feet bgs)	Result (mg/kg)
SAR03	1A	ECMRP2-SO01A	ECMRP2-SS01A-000H	01/09/18	0 – 0.5	60.1 J
			ECMRP2-SB01A-011H	01/09/18	1 – 1.5	72 J
			ECMRP2-SB01A-022H	01/09/18	2 – 2.5	18 J
			ECMRP2-SB01A-033H	01/09/18	3 – 3.5	13.2 J
	1B	ECMRP2-SO01B	ECMRP2-SS01B-000H	01/09/18	0 – 0.5	25.3 J
			ECMRP2-SB01B-011H	01/09/18	1 – 1.5	14.4 J
			ECMRP2-SB01B-022H	01/09/18	2 – 2.5	11.1 J
			ECMRP2-SB01B-033H	01/09/18	3 – 3.5	8.9 J
	1C	ECMRP2-SO01C	ECMRP2-SS01C-000H	01/10/18	0 – 0.5	36
			ECMRP2-SB01C-011H	01/10/18	1 – 1.5	17.5
			ECMRP2-SB01C-022H	01/10/18	2 – 2.5	10.8
			ECMRP2-SB01C-033H	01/10/18	3 – 3.5	9.9
	1D	ECMRP2-SO01D	ECMRP2-SS01D-000H	01/10/18	0 – 0.5	22.5 J
			ECMRP2-SB01D-011H	01/10/18	1 – 1.5	15.2 J
			ECMRP2-SB01D-022H	01/10/18	2 – 2.5	9.5 J
			ECMRP2-SB01D-033H	01/10/18	3 – 3.5	8.4 J

Table 2-2. Remedial Investigation Data Summary for MRP Site 2 – Lead

						Lead
Background Level^a (mg/kg)						27
USEPA Eco-SSL^b (mg/kg)						11
Residential Human Health Screening Level^c (mg/kg)						80
Industrial Human Health Screening Level^c (mg/kg)						320
SI Grid Cell ID	RI Sub-Grid Cell ID	Station ID	Sample ID^d	Sample Date	Sample Depth (feet bgs)	Result (mg/kg)
N/A	1E	ECMRP2-SO01E	ECMRP2-SS01E-000H	01/09/18	0 – 0.5	744
			ECMRP2-SB01E-011H	01/09/18	1 – 1.5	43.5
			ECMRP2-SB01E-022H	01/09/18	2 – 2.5	27.4
			ECMRP2-SB01E-033H	01/09/18	3 – 3.5	30.1
	1F	ECMRP2-SO01F	ECMRP2-SS01F-000H	01/09/18	0 – 0.5	64.4
			ECMRP2-SB01F-011H	01/09/18	1 – 1.5	18.3
			ECMRP2-SB01F-022H	01/09/18	2 – 2.5	15.6
			ECMRP2-SB01F-033H	01/09/18	3 – 3.5	14.7
	1G	ECMRP2-SO01G	ECMRP2-SS01G-000H	01/09/18	0 – 0.5	25.3
			ECMRP2-SB01G-011H	01/09/18	1 – 1.5	18.4
			ECMRP2-SB01G-022H	01/09/18	2 – 2.5	12.3
			ECMRP2-SB01G-033H	01/09/18	3 – 3.5	14.2
	1H	ECMRP2-SO01H	ECMRP2-SS01H-000H	01/08/18	0 – 0.5	21.2
			ECMRP2-SB01H-011H	01/08/18	1 – 1.5	17.3
			ECMRP2-SB01H-022H	01/08/18	2 – 2.5	30.1
			ECMRP2-SB01H-033H	01/08/18	3 – 3.5	10.5
	1I	ECMRP2-SO01I	ECMRP2-SS01I-000H	01/30/18	0 – 0.5	57.6
	1J	ECMRP2-SO01J	ECMRP2-SS01J-000H	01/30/18	0 – 0.5	30.3

Table 2-2. Remedial Investigation Data Summary for MRP Site 2 – Lead

						Lead
Background Level^a (mg/kg)						27
USEPA Eco-SSL^b (mg/kg)						11
Residential Human Health Screening Level^c (mg/kg)						80
Industrial Human Health Screening Level^c (mg/kg)						320
SI Grid Cell ID	RI Sub-Grid Cell ID	Station ID	Sample ID^d	Sample Date	Sample Depth (feet bgs)	Result (mg/kg)
SAR10	2A	ECMRP2-SO02A	ECMRP2-SS02A-000H	01/10/18	0 – 0.5	15.4
			ECMRP2-SB02A-011H	01/10/18	1 – 1.5	15.1
			ECMRP2-SB02A-022H	01/10/18	2 – 2.5	14.6
			ECMRP2-SB02A-033H	01/10/18	3 – 3.5	9
	2B	ECMRP2-SO02B	ECMRP2-SS02B-000H	01/10/18	0 – 0.5	18.2
			ECMRP2-SB02B-011H	01/10/18	1 – 1.5	14.4
			ECMRP2-SB02B-022H	01/10/18	2 – 2.5	12
			ECMRP2-SB02B-033H	01/10/18	3 – 3.5	10.7
	2C	ECMRP2-SO02C	ECMRP2-SS02C-000H	01/10/18	0 – 0.5	20.2
			ECMRP2-SB02C-011H	01/10/18	1 – 1.5	15
			ECMRP2-SB02C-022H	01/10/18	2 – 2.5	12.6
			ECMRP2-SB02C-033H	01/10/18	3 – 3.5	8.9
	2D	ECMRP2-SO02D	ECMRP2-SS02D-000H	01/10/18	0 – 0.5	16.1
			ECMRP2-SB02D-011H	01/10/18	1 – 1.5	13.6
			ECMRP2-SB02D-022H	01/10/18	2 – 2.5	11.8
			ECMRP2-SB02D-033H	01/10/18	3 – 3.5	9.6

Table 2-2. Remedial Investigation Data Summary for MRP Site 2 – Lead

						Lead
Background Level^a (mg/kg)						27
USEPA Eco-SSL^b (mg/kg)						11
Residential Human Health Screening Level^c (mg/kg)						80
Industrial Human Health Screening Level^c (mg/kg)						320
SI Grid Cell ID	RI Sub-Grid Cell ID	Station ID	Sample ID^d	Sample Date	Sample Depth (feet bgs)	Result (mg/kg)
Stockpile	Stockpile	ECMRP2-STP-1A	ECMRP2-STP-1A-000H	01/11/18	0 – 0.5 ^e	19.2
		ECMRP2-STP-1B	ECMRP2-STP-1B-000H	01/11/18		19.9
		ECMRP2-STP-1C	ECMRP2-STP-1C-000H	01/11/18		14.4
		ECMRP2-STP-1D	ECMRP2-STP-1D-000H	01/11/18		23.5

^a Background concentrations from Final Soil Background Concentration Study Report (SWES, 2013).

^b The most conservative of the plants, soil invertebrates, avian, and mammalian USEPA Eco-SSLs (USEPA, 2008).

^c The most conservative value between the USEPA RSLs (USEPA, 2018a) and the DTSC Note 3 values (DTSC, 2018), where available.

^d oil samples are 5-point composite collected within the RI Sub-Grid from the same depth interval.

^e Soil samples were collected from 0 to 0.5 foot bgs in relation to the surface of the stockpile.

Notes:

Shaded concentrations exceed the background level (SWES, 2013) and the USEPA Eco-SSL (USEPA, 2008).

Green concentrations exceed the background level (SWES, 2013) and the DTSC Note 3 residential value (DTSC, 2018)

Red concentrations exceed the background level (SWES, 2013) and the DTSC Note 3 industrial value (DTSC, 2018)

Table 2-3. Remedial Investigation Data Summary for MRP Site 2 – Geotechnical Sample Results

SI Grid Cell ID	RI Sub-Grid Cell ID	Station ID	Sample ID ^a	Sample Date	Sample Depth (feet bgs)	TCLP Lead (µg/L)	Moisture (%)	pH	TOC (mg/kg)
SAR03	1A	ECMRP2-SO01A	ECMRP2-SS01A-000H	01/09/18	0 – 0.5	7.6	6.2	7.15	6,100
			ECMRP2-SB01A-011H	01/09/18	1 – 1.5	NA	9.7	7.45	5,700
			ECMRP2-SB01A-022H	01/09/18	2 – 2.5	NA	10.8	7.43	5,900
			ECMRP2-SB01A-033H	01/09/18	3 – 3.5	NA	10	7.58	3,100
	1B	ECMRP2-SO01B	ECMRP2-SS01B-000H	01/09/18	0 – 0.5	NA	6.2	7.23	7,600
			ECMRP2-SB01B-011H	01/09/18	1 – 1.5	0.49 J	10.9	7.42	4,900
			ECMRP2-SB01B-022H	01/09/18	2 – 2.5	NA	10.9	7.64	4,100
			ECMRP2-SB01B-033H	01/09/18	3 – 3.5	NA	7.7	7.84	1,000
	1C	ECMRP2-SO01C	ECMRP2-SS01C-000H	01/10/18	0 – 0.5	3.1	9.1	7.06	7,500
			ECMRP2-SB01C-011H	01/10/18	1 – 1.5	NA	11.2	7.29	5,000
			ECMRP2-SB01C-022H	01/10/18	2 – 2.5	NA	10.2	7.27	3,600
			ECMRP2-SB01C-033H	01/10/18	3 – 3.5	NA	9	7.34	2,000
	1D	ECMRP2-SO01D	ECMRP2-SS01D-000H	01/10/18	0 – 0.5	0.85 J	10.2	7.22	4,700
			ECMRP2-SB01D-011H	01/10/18	1 – 1.5	NA	10.1	7.16	4,300
			ECMRP2-SB01D-022H	01/10/18	2 – 2.5	NA	8.1	7.29	3,300
			ECMRP2-SB01D-033H	01/10/18	3 – 3.5	NA	6.8	7.63	2,100
N/A	1E	ECMRP2-SO01E	ECMRP2-SS01E-000H	01/09/18	0 – 0.5	NA	7.9	7	10,000
			ECMRP2-SB01E-011H	01/09/18	1 – 1.5	NA	10.4	7.18	7,200
			ECMRP2-SB01E-022H	01/09/18	2 – 2.5	NA	11.2	7.42	4,100
			ECMRP2-SB01E-033H	01/09/18	3 – 3.5	NA	8	7.57	3,400

Table 2-3. Remedial Investigation Data Summary for MRP Site 2 – Geotechnical Sample Results

SI Grid Cell ID	RI Sub-Grid Cell ID	Station ID	Sample ID ^a	Sample Date	Sample Depth (feet bgs)	TCLP Lead (µg/L)	Moisture (%)	pH	TOC (mg/kg)
	1F	ECMRP2-SO01F	ECMRP2-SS01F-000H	01/09/18	0 – 0.5	NA	7.8	6.2	9,000
			ECMRP2-SB01F-011H	01/09/18	1 – 1.5	NA	12.6	7.18	6,700
			ECMRP2-SB01F-022H	01/09/18	2 – 2.5	NA	12.1	7.08	6,000
			ECMRP2-SB01F-033H	01/09/18	3 – 3.5	NA	12.3	7.13	2,400
N/A	1G	ECMRP2-SO01G	ECMRP2-SS01G-000H	01/09/18	0 – 0.5	NA	6.5	6.98	8,400
			ECMRP2-SB01G-011H	01/09/18	1 – 1.5	NA	10.1	7.12	6,700
			ECMRP2-SB01G-022H	01/09/18	2 – 2.5	NA	10	7.34	4,600
			ECMRP2-SB01G-033H	01/09/18	3 – 3.5	NA	9.6	7.55	4,000
	1H	ECMRP2-SO01H	ECMRP2-SS01H-000H	01/08/18	0 – 0.5	NA	5.2	6.95	6,200
			ECMRP2-SB01H-011H	01/08/18	1 – 1.5	NA	10.4	7.17	6,000
			ECMRP2-SB01H-022H	01/08/18	2 – 2.5	NA	10.6	7.34	5,900
			ECMRP2-SB01H-033H	01/08/18	3 – 3.5	NA	10.3	7.53	3,800
	1I	ECMRP2-SO01I	ECMRP2-SS01I-000H	01/30/18	0 – 0.5	NA	8.7	NA	NA
	1J	ECMRP2-SO01J	ECMRP2-SS01J-000H	01/30/18	0 – 0.5	NA	6.8	NA	NA
SAR10	2A	ECMRP2-SO02A	ECMRP2-SS02A-000H	01/10/18	0 – 0.5	NA	5.3	6.96	5,200
			ECMRP2-SB02A-011H	01/10/18	1 – 1.5	NA	7.7	7.34	4,300
			ECMRP2-SB02A-022H	01/10/18	2 – 2.5	NA	7.5	6.96	4,600
			ECMRP2-SB02A-033H	01/10/18	3 – 3.5	NA	8.4	7.6	2,600
	2B	ECMRP2-SO02B	ECMRP2-SS02B-000H	01/10/18	0 – 0.5	NA	5.6	6.73	7,200
			ECMRP2-SB02B-011H	01/10/18	1 – 1.5	NA	8.6	7.46	3,700

Table 2-3. Remedial Investigation Data Summary for MRP Site 2 – Geotechnical Sample Results

SI Grid Cell ID	RI Sub-Grid Cell ID	Station ID	Sample ID ^a	Sample Date	Sample Depth (feet bgs)	TCLP Lead (µg/L)	Moisture (%)	pH	TOC (mg/kg)
			ECMRP2-SB02B-022H	01/10/18	2 – 2.5	NA	10.8	7.8	2,200
			ECMRP2-SB02B-033H	01/10/18	3 – 3.5	NA	9	7.32	1,300
	2C	ECMRP2-SO02C	ECMRP2-SS02C-000H	01/10/18	0 – 0.5	NA	4.3	6.9	4,800
			ECMRP2-SB02C-011H	01/10/18	1 – 1.5	NA	8.1	6.86	4,000
			ECMRP2-SB02C-022H	01/10/18	2 – 2.5	NA	8.7	7.41	4,100
			ECMRP2-SB02C-033H	01/10/18	3 – 3.5	NA	7.7	7.69	1,700
SAR10	2D	ECMRP2-SO02D	ECMRP2-SS02D-000H	01/10/18	0 – 0.5	NA	5.7	6.93	5,100
			ECMRP2-SB02D-011H	01/10/18	1 – 1.5	NA	8.4	7.14	2,900
			ECMRP2-SB02D-022H	01/10/18	2 – 2.5	NA	9.3	7.38	2,200
			ECMRP2-SB02D-033H	01/10/18	3 – 3.5	NA	8.7	7.8	1,300
Stockpile	Stockpile	ECMRP2-STP-1A	ECMRP2-STP-1A-000H	01/11/18	0 – 0.5 ^b	6.3	2.9	7.34	2,900
		ECMRP2-STP-1B	ECMRP2-STP-1B-000H	01/11/18		18.7	3	7.28	3,300
		ECMRP2-STP-1C	ECMRP2-STP-1C-000H	01/11/18		1.6 J	3.1	7.41	2,900
		ECMRP2-STP-1D	ECMRP2-STP-1D-000H	01/11/18		3.5	3.4	7.31	4,100
Minimum							2.9	6.20	1,000
Maximum							12.6	7.84	10,000
Average							8.4	7.27	4,533

^a Soil samples are 5-point composite collected within the RI Sub-Grid from the same depth interval.

^b Soil samples were collected from 0 to 0.5 foot bgs in relation to the surface of the stockpile.

Notes:

N/A = not applicable. Step-out sub-grid cells are outside of SI grid cells.

NA = not analyzed

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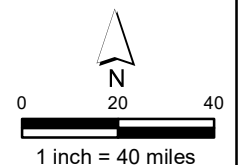


IMAGERY SOURCE:
 ESRI ArcGIS Online Web Service,
 World Street Map

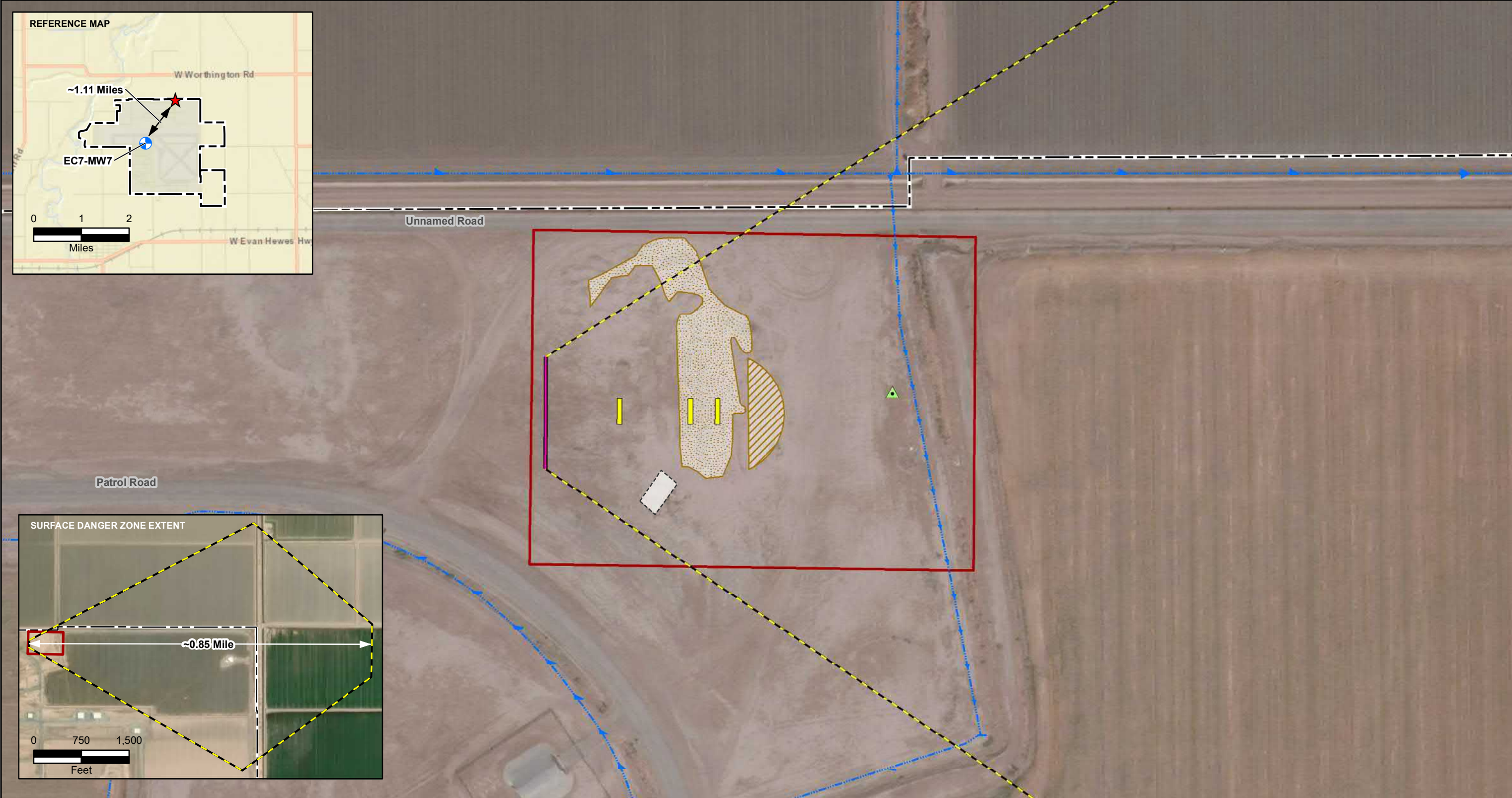


NOTE:
 MRP = Munitions Response Program

Figure 2-1
 Facility Location Map
 Engineering Evaluation/Cost Analysis for MRP Site 2
 Naval Air Facility El Centro, El Centro, California



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LEGEND

- United States Navy Boundary Marker
- EC7-MW7
- Irrigation/Drainage Canal
- Former Firing Line
- Surface Danger Zone
- Former Target Stand
- Former Location of Earthen Butt/Backstop Berm

- Approximate Extent of Stockpiled Soil From Earthen Butt/Backstop Berm
- Concrete/Metal Debris (Remains of Building 162)
- MRP Site 2 Boundary
- Installation Boundary

NOTE:
MRP = Munitions Response Program

DATA SOURCE:
- Battelle, SI, 10/2007

IMAGERY SOURCE:
ESRI ArcGIS Online Web Service,
NAIP, 06/06/2014

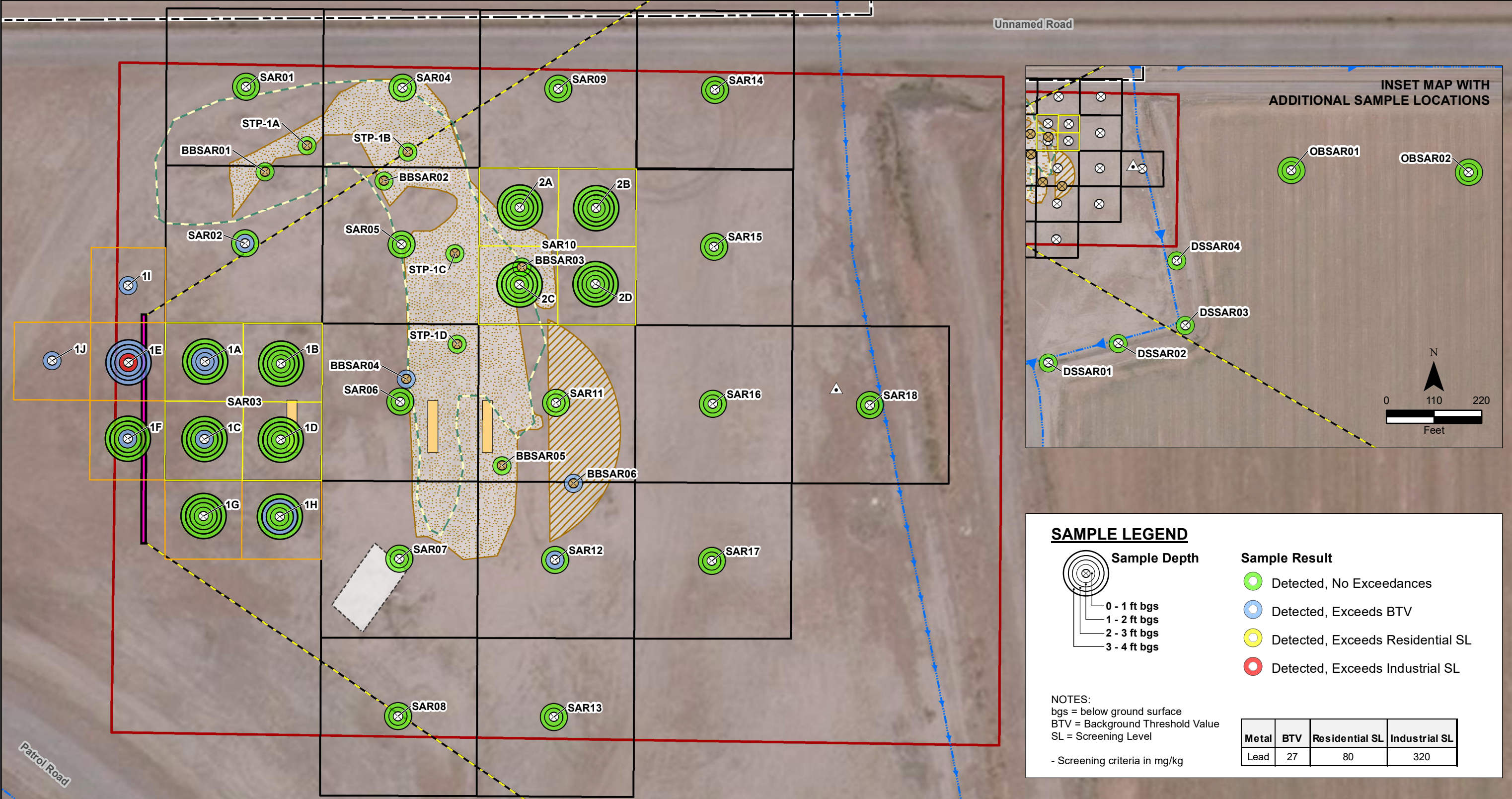
Figure 2-2
MRP Site 2 Layout
Engineering Evaluation/Cost Analysis for MRP Site 2
Naval Air Facility El Centro, El Centro, California

0 50 100
Feet
1 inch = 100 feet

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LEGEND

- Current Stockpile Extent
- Composite Sample Location
- Composite Soil Sample Location
- Irrigation/Drainage Canal
- Former Firing Line
- Current Stockpile Extent

- RI Sample Sub-Grid
- RI Sample Sub-Grid - Step-Out
- SI Sample Grid
- Surface Danger Zone
- Former Target Stand
- Former Location of Earthen Butt/Backstop Berm
- Concrete/Metal Debris (Remains of Building 162)

- Approximate Extent of Stockpiled Soil from Earthen Butt/Backstop Berm During the SI
- MRP Site 2 Boundary
- Installation Boundary

Figure 2-3
Sample Locations and Screening Level Exceedances – Lead
Engineering Evaluation/Cost Analysis for MRP Site 2
Naval Air Facility El Centro, El Centro, California

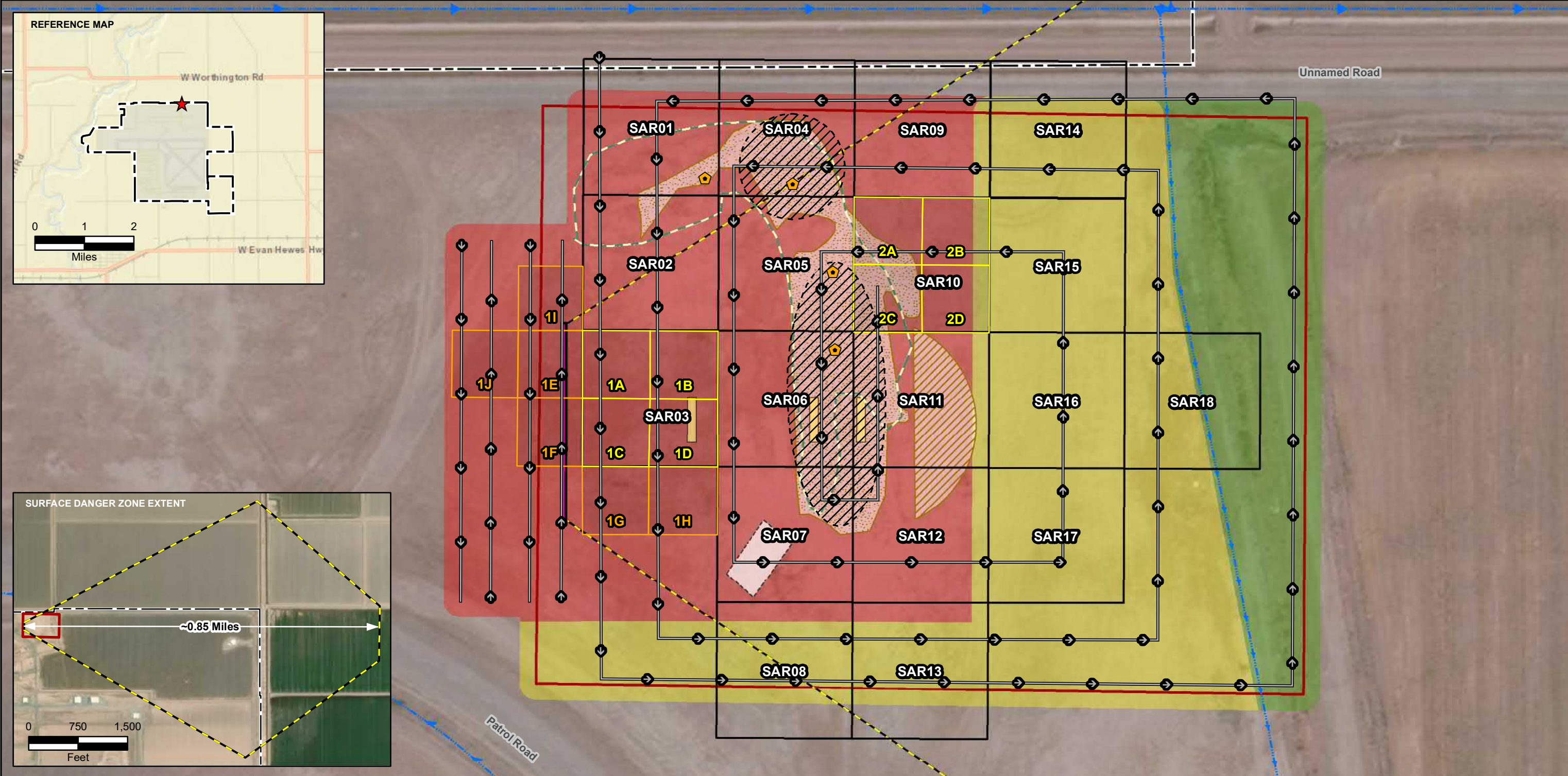
DATA SOURCE:
- Battelle, SI, 10/2007

IMAGERY SOURCE:
ESRI ArcGIS Online Web Service,
NAIP, 06/06/2014

NOTES:
RI = Remedial Investigation
SI = Site Investigation
MRP = Munitions Response Program

0 25 50
Feet
1 inch = 50 feet

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LEGEND

- Current Stockpile Extent
- Composite Sample Location
- Irrigation/Drainage Canal
- Former Firing Line
- Current Stockpile Extent
- Metal Mapping Survey Transect - 6' Arc
- RI Sample Sub-Grid
- RI Sample Sub-Grid - Step-Out
- SI Sample Grid
- Surface Danger Zone
- Former Target Stand
- Former Location of Earthen Butt/Backstop Berm
- Concrete/Metal Debris (Remains of Building 162)
- Approximate Extent of Stockpiled Soil from Earthen Butt/Backstop Berm During the SI
- MRP Site 2 Boundary
- Installation Boundary

Metal Debris Distribution

- Some Metal Debris Detected but No Ammunition Detected
- Moderate Concentrated Areas of Metal Debris or Ammunition Fragments
- Highly Concentrated Areas of Ammunition Fragments and/or Metal Debris
- Approximate Areas With Bullets Observed at the Surface

NOTES:

- RI = Remedial Investigation
- SI = Site Inspection
- MRP = Munitions Response Program

Figure 2-4

Results of Detector-aided Visual Reconnaissance
Engineering Evaluation/Cost Analysis for MRP Site 2
Naval Air Facility El Centro, El Centro, California

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3.0 Identification of Removal Action Objectives

Removal Action Objectives (RAOs) are developed to guide the RA and ensure that it complies with regulatory requirements. This section identifies the RA requirements (including statutory limits), RAOs, a proposed schedule that pertains to the RA, and applicable or relevant and appropriate requirements (ARARs) identified for the RA.

3.1 Removal Action Requirements

NTCRAs funded by USEPA have a \$2 million and a 12-month statutory limit pursuant to CERCLA § 104(c)(1). Because RAs at NAF El Centro are not funded by USEPA, these statutory limits do not generally apply. CERCLA requires that effectiveness, implementability, and cost be considered in evaluating the alternatives.

The RA would be undertaken pursuant to CERCLA and the NCP, which authorizes the Navy to conduct and finance RAs. The mandated public comment period requirement for EE/CAs provides the opportunity for public input to the cleanup process. NAF El Centro does not have a Federal Facility Agreement or Federal Facility State Remediation Agreement and implements its restoration in accordance with federal and state laws in cooperation with its regulatory partners.

The Navy, with state regulatory oversight, is the lead agency for the RA and has final approval authority over the recommended alternative, all public participation activities, preparation of this EE/CA, and execution of the recommended alternative. The state has been involved in the EE/CA approach and the Navy seeks the state's concurrence with respect to the selection of any ultimate response action. This EE/CA complies with the requirements of CERCLA, SARA, NCP, Defense Environmental Restoration Program, EO 12580, and is being pursued under 40 CFR Part 300.415(b)(2).

3.2 Removal Action Scope and Objectives

The scope of the RA is to eliminate potentially unacceptable risk associated with lead-impacted soil at MRP Site 2. Based on CERCLA, the NCP, and the human health and ERAs, alternatives in this EE/CA have been developed to meet the following RAO for MRP Site 2:

- Prevent exposure to surface soil containing lead at concentrations that exceed the cleanup goal and pose an unacceptable risk to future residents.

The scope of the engineering measures for each alternative developed is discussed in **Section 4**.

3.3 Determination of Removal Action Schedule

This EE/CA will be placed in the information repository for a 30-day public comment period. Notice of its availability, along with a brief summary, will be published in the Imperial Valley Press. A 30-day public comment period will commence once the notice is published. NAF El Centro will review the comments and take all substantive public comments into consideration in finalizing the EE/CA. A formal project schedule will be developed as part of the RA decision document (i.e., AM) and Work Plan (WP).

Because this RA has been designated non-time-critical, the start date will be determined by factors other than the urgency of the threat. Possible factors include time needed to circulate documents for review and to seek regulatory concurrence, weather conditions, availability of resources, and site constraints.

The total project period is estimated to require approximately 18 months from the end of the public comment period through completion of CERCLA documentation. Critical milestones and durations related to the EE/CA are summarized as follows:

- Review and comment and other regulatory coordination
- EE/CA public comment period: 1 month
- WP, subcontracting, and mobilization: 10 months
- RA: 1 month
- CERCLA documentation: 6 months

3.4 Applicable or Relevant and Appropriate Requirements

CERCLA § 121(d)(l) requires remedial actions attain (or waive) ARARs. The NCP at 40 CFR § 300.5 defines applicable requirements as “those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location or other circumstance found at a CERCLA site...” The NCP at 40 CFR § 300.5 defines relevant and appropriate requirements as “those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that, while not “applicable” to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site and that their use is well suited to the particular site...” An ARAR may be either applicable or relevant and appropriate, but not both.

CERCLA § 121 does not expressly require that CERCLA RAs comply with ARARs; however, USEPA has promulgated a requirement in the NCP mandating that CERCLA RAs comply with ARARs, to the extent practicable, considering the exigencies of the situation, and it is Navy policy to follow this requirement.

The Navy, as the lead agency, is responsible for identifying potential federal ARARs. Pursuant to CERCLA and the NCP, the Navy initiated the identification of potential state ARARs by requesting state ARARs from DTSC and the CRWQCB for MRP Site 2. On January 6, 2020, the Navy sent a request for potential state ARARs to DTSC and the Water Board. The Navy received responses from DTSC and the California Department of Fish and Wildlife, dated February 2020, and from the CRWQCB dated April 2020 (Attachment A2 of **Appendix A**). The Navy’s evaluation of potential state ARARs is included in Attachment A3 of **Appendix A**. State ARARs that have been accepted by the Navy are included in this report.

The identification of ARARs is based on a number of site-specific factors, including the environmental media of concern, the COCs being addressed, the physical characteristics of the site, the location of the site, and the response actions being considered. ARARs are divided into three categories to aid in their identification: chemical-specific, location-specific, and action-specific. This section summarizes potential federal and state ARARs identified for MRP Site 2. **Appendix A** discusses the evaluation of ARARs in detail.

3.4.1 Chemical-Specific ARARs

Chemical-specific ARARs are health- or risk-based numerical values or methodologies that, when applied to site-specific conditions, result in the establishment of numerical cleanup values. These values establish the amount or concentration of a chemical that may be detected in or

discharged to the ambient environment, while remaining protective of human health and the environment.

Soil is the medium of concern for MRP Site 2. The Navy has identified potential chemical-specific ARARs for characterizing waste generated in implementing the CERCLA response action. The substantive provisions of the following requirements are potential ARARs for characterizing waste; however, none of these potential ARARs were used to develop RAOs or cleanup goals:

- Resource Conservation and Recovery Act (RCRA) hazardous waste definitions at California Code of Regulations (Cal. Code Regs.) Title (tit.) 22, §§ 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100
- Cal. Code Regs. tit. 22, §§ Cal. Code Regs. tit. 22, §§ 66261.3(a)(2)(C) 66261.3(a)(2)(F), 66261.22(a)(3) and (4), 66261.24(a)(2)–(a)(8), 66261.101(a)(1) and (a)(2): defining a non-RCRA state-regulated hazardous waste
- Cal. Code Regs. tit. 27, §§ 20210, 20220, and 20230: defining a designated waste, nonhazardous solid waste, and an inert waste

3.4.2 Location-Specific ARARs

Location-specific ARARs restrict activities or limit concentrations of hazardous substances solely because of geographical or land use concerns and are associated with eight protected or regulated resource categories. These resource categories are cultural resources, wetlands, floodplains, hydrologic resources, biological resources, coastal resources, geological characteristics of the site, and other natural resources. Migratory birds, including the burrowing owl, are present at MRP Site 2. The ERA concluded that concentrations of chemicals at the site are below levels expected to pose risk to ecological receptors. However, proposed actions may include earthmoving activities so surveys to identify if burrowing owls are present on MRP Site 2 will be conducted, and, if burrowing owls are identified on site, appropriate avoidance measures will be implemented. The Navy has identified the following potential location-specific ARAR for the protection of the migratory birds:

- Migratory Bird Treaty Act of 1972 at 16 U.S.C. § 703 – protecting migratory birds from unregulated taking.

3.4.3 Action-Specific ARARs

Action-specific ARARs are technology- or activity-based requirements for or limitations on remedial actions. These requirements are triggered by the particular removal activities conducted at the site and indicate how a selected alternative should be completed. No potential action-specific ARARs were used to develop the RAOs or cleanup goals. Action-specific ARARs were developed for the alternatives evaluated in this EE/CA (**Section 4**). The potential action-specific ARARs are discussed in detail in **Appendix A**.

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4.0 Identification and Analysis of Alternatives

This section presents the alternatives proposed to achieve the RAO identified in **Section 3.2**, as well as the comparative analysis of the alternatives. This section identifies the cleanup goal and estimated volume of impacted soil, describes the alternatives that could be implemented to achieve the RAO, and evaluates the alternatives based on NCP criteria. The alternatives for this NTCRA were considered using professional judgment and information from previous investigations. The no action alternative was included and evaluated for comparative purposes.

4.1 Cleanup Goal and Estimated Volume of Impacted Soil

To meet the RAO, a cleanup goal was established for the lead-impacted soil. The cleanup goal for lead is the DTSC risk-based concentration for residential exposure of 80 mg/kg, which is above the lead BTV of 27 mg/kg. This risk-based concentration is based on a biomarker that corresponds to 1 microgram per deciliter incremental blood lead (DTSC, 2018). The cleanup goal for lead is met if the 95UCL on the arithmetic mean at MRP Site 2 does not exceed the cleanup goal, provided no geographically collocated areas of elevated concentrations of lead are present (DTSC, 2018).

The estimated volume of impacted soil is based on the analytical results from the SI and RI, and encompasses the footprint of the lead-impacted soil at MRP Site 2 that poses a threat to hypothetical future residents, as shown on **Figure 4-1**. The area corresponds to RI sub-grid 1E, near the firing line of the former Small Arms Range, where lead was detected exceeding the cleanup goal. The estimated volume of lead-impacted soil is approximately 1,700 cubic feet (approximately 62 cubic yards). By preventing exposure to this volume of lead-impacted soil, the residual 95UCL is less than the cleanup goal.

4.2 Description of Alternatives

Based on the RAO presented in **Section 3.2**, three alternatives have been developed for the soil at MRP Site 2. The alternatives evaluated in this EE/CA are the following:

- Alternative 1: No Action
- Alternative 2: ICs
- Alternative 3: Excavation and Offsite Disposal

A description of each of these alternatives is presented below.

4.2.1 Alternative 1 – No Action

The no action alternative is evaluated as a baseline for comparison of alternatives. Under this alternative, the area would be left as it currently exists. Under this alternative, no controls or removal technologies would be implemented. CERCLA § 121(c), as amended by SARA (1986), requires that the site be reviewed every 5 years because the waste will remain onsite. It is assumed that the current level of maintenance would be sustained.

4.2.2 Alternative 2 – Institutional Controls

Alternative 2 consists of the implementation of institutional controls (ICs) to prohibit future residential development and use of the removal target area of MRP Site 2. The main components of Alternative 2 are described below:

4.2.2.1 Planning Documents

A land use control implementation plan would be prepared, documenting the implementation of ICs and the monitoring and inspection requirements.

4.2.2.2 Institutional Controls

The ICs, in the form of administrative controls in the Base master plan, would be applied to the removal target area of MRP Site 2 (**Figure 4-1**). The ICs would prevent residential development and use of this area. The Navy would be responsible for implementing, maintaining, inspecting, reporting, and enforcing the ICs. Physical inspections are assumed to be performed annually. The monitoring and inspections would be conducted annually and would address items such as whether MRP Site 2 is properly listed in the Navy's IC registry (Navy Installation Restoration Information Solution land use control [LUC] tracker), whether restrictions and controls continue to be protective, whether any obvious deficiencies exist, and whether use of the property conforms to the restrictions in place.

4.2.2.3 Reporting

Annual IC compliance monitoring reports would be prepared documenting results of annual IC inspections. A duration of 30 years is assumed for costing purposes. Six 5-year reviews are assumed to be conducted as required under CERCLA and NCP requirements. All reports would be provided to the appropriate regulatory agencies for their review and comment.

4.2.3 Alternative 3 – Excavation and Offsite Disposal

Alternative 3 would remove lead-impacted soil with lead concentrations that exceed the cleanup goal. The extent of excavation of lead-impacted soil (removal target area) is shown on **Figure 4-1**. This alternative would include planning documents, site preparation activities, excavation, confirmation soil sampling, offsite disposal, and site restoration. Green and sustainable remediation best management practices that can be implemented with this alternative include truck and equipment idling control, site restoration with locally available and low-maintenance grasses and plants, using a nearby disposal facility to minimize truck emissions, and recovering metal debris that can be recycled to avoid disposal. Alternative 3 would be intended to achieve unrestricted use/unlimited exposure (UU/UE). The main components of Alternative 3 are described in the following subsections.

4.2.3.1 Planning Documents

Several planning documents would be prepared prior to implementation of this alternative. An Accident Prevention Plan and Site Health and Safety Plan would be prepared meeting Navy requirements. Field work would be conducted in accordance with an Explosives Safety Submission Determination Request and a WP. Prior to excavation, a dig permit and approval to work within the flight line area would be obtained from NAF El Centro.

4.2.3.2 Site Preparation

Site preparation would include utility clearance, land surveying, and stormwater management. Buried utilities would be identified and marked to avoid damage to these structures during excavation. A preconstruction land survey of the removal target area would be conducted to demarcate the excavation area. Erosion and sedimentation controls would be installed, as necessary, for stormwater management. The controls would be detailed in a Stormwater Pollution Prevention Plan. Staging areas would also be set up.

4.2.3.3 Biological Survey, Monitoring, and Avoidance and Minimization Measures

Prior to and during the implementation of Alternative 3, a biologist would conduct a preconstruction biological survey to ensure that special-status species or signs of special-status species (e.g., active burrows, droppings, prey remains) are not present in the working areas. Burrowing owl surveys would be conducted prior to and weekly during project implementation in accordance with recognized survey protocols and avoidance and minimization measures as recommended by the California Burrowing Owl Consortium (1993), which do not result in harassment or harm to the species as referred to in the Federal Migratory Bird Treaty Act. Although not expected to occur at MRP Site 2, sensitive plants would also be identified during the site survey and flagged for avoidance. Prior to the start of work, environmental awareness training would be provided for all personnel working at MRP Site 2.

General practices to avoid impacts to ecological receptors on MRP Site 2 would be followed, including maintaining appropriate buffer zones around sensitive resources (e.g., active burrowing owl burrows) and otherwise minimizing ground disturbance and off-road vehicle and foot traffic access routes. Activities associated with Alternative 3 would be kept to the smallest footprint feasible, while still meeting the RAO. Details of potential biological avoidance, minimization, and mitigation measures would be consistent with Basewide provisions for these activities, as specified in the Integrated Natural Resources Management Plan (Tierra Data, 2014). Biological surveying, monitoring, and avoidance and minimization measures details would be described in the WP.

4.2.3.4 Excavation and Offsite Disposal

Alternative 3 would be accomplished using standard mechanized heavy equipment such as backhoes, excavators, loaders, and end-dump trucks. The removal target area would be excavated down to 1 foot bgs. An estimated total of 62 cubic yards of material would be excavated. A metal detector would be used to assist in identifying bullet and bullet fragments in the surface throughout MRP Site 2 firing line, range floor, and stockpiled soil from the former berm. If bullet and bullet fragments are recovered, they would be shipped offsite for recycling. Dust and erosion control and other best management practices would be implemented during excavation and offsite disposal. Before offsite disposal of the excavated lead-impacted soil, waste characterization samples would be collected as required by the disposal facility. For cost estimating purposes, it is assumed that the disposal facility would require three waste characterization samples. Waste characterization samples would be analyzed for Target Analyte List metals and TCLP metals with a 7-day turn-around time. The waste characterization sample results would be submitted to the waste subcontractor prior to removal activities.

4.2.3.5 Post-excavation Confirmation Sampling

Confirmation soil samples would be collected to verify that lead in soil meets the cleanup goal. The confirmation sample locations, frequency, and approach would be prescribed in the WP. For cost estimating purposes, two incremental confirmation samples using incremental sampling methodology (ITRC, 2012) would be collected from the bottom of the excavation and one incremental soil sample would be collected from each sidewall (total of six incremental soil samples). The excavation would be considered complete if confirmation samples analytical results are below the cleanup goal. If confirmation samples do not achieve the cleanup goal for lead (80 mg/kg), additional excavation either laterally or vertically would be performed (as needed).

4.2.3.6 Site Restoration

After the removal of lead-impacted soil, the excavation would be backfilled with clean material to match the existing grade and compacted to meet local or state requirements. Backfilling material would be sampled and analyzed to confirm it is clean and usable for backfill. Clean overburden (if encountered) may be used for backfill. Following backfilling activities, the excavation area would be graded to match existing topography, with adequate surface drainage to prevent ponding of water. Excavation boundaries would be field measured or surveyed. All equipment, materials, and temporary erosion and sedimentation controls would be removed from the site at completion.

4.2.3.7 Reporting

An NTCRA Completion Report, including site closeout documentation, would be prepared documenting the excavation and disposal of the contaminated soil. A duration of 1 year (including planning and implementation) is assumed for costing purposes.

4.3 Alternatives Evaluation Criteria

Because the NTCRA is being conducted during the RI phase, the alternatives are evaluated against the nine NCP criteria (Navy, 2018). This allows the EE/CA to meet FS requirements in the CERCLA Process. The NCP (40 CFR § 300.430[e][9][iii]) categorizes evaluation criteria into three groups (threshold criteria, balancing criteria, and modifying criteria), each with its own weight. The NCP requires evaluation of the alternatives against threshold criteria, balancing criteria, and modifying criteria.

Threshold criteria are requirements that each alternative must meet to be eligible for selection as the preferred alternative. There is little flexibility in meeting the threshold criteria, the alternative must meet them or it is unacceptable. The threshold criteria consist of:

- Overall protection of human health and the environment
The assessment describes how the action achieves and maintains protection of human health and the environment and achieves site-specific objectives both during and after implementation.
- Compliance with ARARs
An alternative is assessed in terms of its compliance with ARARs, or if a waiver is required, how it is justified. Potential chemical-, location-, and action-specific ARARs for alternatives at MRP Site 2 are identified in **Section 3**. A detailed analysis of potential ARARs associated with RA alternatives at MRP Site 2 is presented in **Appendix A**.

Balancing criteria are used to weigh the tradeoffs among alternatives. The balancing criteria are the main technical criteria used in the detailed evaluation and comparative analysis of alternatives. The balancing criteria consist of:

- Long-term effectiveness and permanence
An action is assessed in terms of its long-term effectiveness in maintaining protection of human health and the environment after response action objectives have been met. The magnitude of residual risk and adequacy and reliability of post-investigation site controls are taken into consideration.

- Reduction of toxicity, mobility, or volume through treatment

An action is assessed in terms of anticipated performance of the specific treatment technologies it employs. Factors such as volume of materials destroyed or treated, the degree of expected reductions, the degree to which treatment is irreversible, and the type and quantity of remaining residuals are taken into consideration.

- Short-term effectiveness

An action is assessed in terms of its effectiveness in protecting human health and the environment during the construction and implementation of a remedy before response action objectives have been met. The duration of time until the RAOs are met is also factored into this criterion.

- Implementability

- Technical - The ability of the technology to implement the remedy is evaluated.
- Administrative - The administrative feasibility factor evaluates requirements for permits, zoning variances, impacts on adjoining property, and the ability to impose ICs.
- Availability of services and material - The availability of treatment, storage, and disposal capacity, personnel, services and materials, and other resources necessary to implement the alternative are evaluated.

- Cost

- The evaluation of cost includes costs for construction, equipment and materials, analytical services, engineering and design, and permit/licenses. In accordance with CERCLA guidance, cost estimates for the alternatives are developed with an expected accuracy range of -30 to +50 percent (**Appendix B**).

Modifying criteria may be used to modify aspects of the preferred alternative when preparing the AM. Modifying criteria are generally evaluated after stakeholders comment on the EE/CA for the site. Accordingly, only the threshold and primary balancing criteria were used in the comparative analysis phase of this EE/CA (**Section 4.3**).

- State acceptance

Alternatives are evaluated with respect to meeting the concerns of state regulatory agencies, to the extent that the Navy, as lead agency, determines such concerns as feasible or appropriate. The State of California will review and comment on the EE/CA and the upcoming AM. Responses to state comments will be included in the draft final and final versions of the EE/CA. State comments will also be considered when selecting the proposed remedy in the AM.

- Community acceptance

Issues and concerns the public might have regarding each of the alternatives are addressed through evaluation of this modifying criteria. Comments are solicited from community members during the review period for the AM for MRP Site 2. These comments are considered in the remedy-selection process. Written responses to significant comments are provided in a Responsiveness Summary to be attached to the Navy's AM, and will be included in the Administrative Record for NAF El Centro.

Sustainability is not one of the nine evaluation criteria. However, when comparing alternatives, opportunities for green and sustainable solutions should be considered to reduce the environmental footprint of remedy components and consider the overall net environmental benefit consistent with the Navy's Guidance on Green and Sustainable Remediation (GSR) (Navy, 2012a) and the companion white paper Integrating GSR within the CERCLA Process during the FS (Navy, 2012b). The eight sustainability factors evaluated include greenhouse gas (GHG) emissions, total energy used, water impacts, oxides of nitrogen (NO_x) emissions, oxides of sulfur (SO_x) emissions, particulate matter with particle sizes of 10 microns or smaller in aerodynamic diameter (PM₁₀), accident risk (fatality), and accident risk (injury). The sustainability evaluation, using SiteWise Version 3.1 (Battelle, 2015), is included in the discussion of the short-term effectiveness evaluation, with the exception of GHG emissions which is included in the long-term effectiveness and performance evaluation. The full results of the SiteWise model are provided in **Appendix C**.

4.4 Evaluation of Alternatives

The three alternatives were evaluated in detail using seven of the nine evaluation criteria described in **Section 4.3**. State and community acceptance will be evaluated for the alternatives following the state's review of the EE/CA and the Public Meeting and comment period. The No Action alternative provides a baseline from which to analyze the other alternatives. As discussed in the remedy description, Alternative 1 does not include any actions. A summary of the detailed evaluation of alternatives is presented in **Table 4-1**.

4.4.1 Alternative 1 – No Action

According to the NCP (40 CFR 300.430[e][6]), this alternative must be evaluated in the same manner as the other alternatives considered in this EE/CA report. The No Action alternative provides a baseline against which other alternatives are compared. Alternative 1 involves no engineered remediation measures, no soil cover or cap, LUCs, or monitoring for disposal area debris at MRP Site 2. This alternative would not include any activities to achieve the RAO. If implemented, this RA alternative would be considered a final remedy for MRP Site 2. No monitoring or periodic reviews would be conducted to verify the protectiveness of this alternative.

4.4.1.1 Overall Protection of Human Health and the Environment

Alternative 1 would not meet the RAO, and therefore is not considered protective of human health and the environment. This alternative has no mechanisms to prevent potentially unacceptable receptor exposure to lead-impacted soil at MRP Site 2. Potential impacts of this alternative could include potential exposure of humans to contaminated surface soil.

4.4.1.2 Compliance with ARARs

Alternative 1 would not meet ARARs because no action would be taken. This alternative involves no steps to prevent access to, reduce, remove, contain, or treat the soil. This alternative would provide no additional protection to human health or the environment if exposure routes should develop.

4.4.1.3 Long-Term Effectiveness and Permanence

Alternative 1 is not considered effective because there would be no controls to prevent potentially unacceptable exposure to lead-impacted soil. This alternative requires no maintenance, long-term management, or other action. Alternative 1 would not be effective or

permanent, and would not meet the RAO in any foreseeable future scenario. Alternative 1 would not generate GHG emissions.

4.4.1.4 Reduction of Toxicity, Mobility, or Volume through Treatment

Alternative 1 would not meet the balancing criteria for reduction of toxicity, mobility, or volume through treatment. No treatment would be performed to reduce toxicity, mobility, or volume of contaminated soil for Alternative 1.

4.4.1.5 Short-Term Effectiveness

Alternative 1 would not involve any construction, transportation-related impacts, noise, or other short-term impacts. There would be no adverse short-term impacts to site workers, the surrounding community, or the environment associated with this alternative. No equipment-related air emissions would be associated with implementation of Alternative 1. This alternative would not require the use of energy or water, would not result in the generation of NO_x, SO_x or PM₁₀, and would not cause increased risks to workers during implementation.

4.4.1.6 Implementability

Alternative 1 would be easy to implement because it requires no action.

4.4.1.7 Cost

No direct costs would be incurred for the implementation of Alternative 1.

4.4.2 Alternative 2 – Institutional Controls

Alternative 2 would generally include the implementation of ICs to limit exposure pathways between future hypothetical residents and lead-impacted soil. The components of Alternative 2 are described in **Section 4.2.2**.

4.4.2.1 Overall Protection of Human Health and the Environment

Alternative 2 is considered protective of human health and the environment. ICs would prevent residential development and use in the area of MRP Site 2 that does not meet the cleanup goal, and would therefore prevent potentially unacceptable exposure to future hypothetical residents from lead-impacted soils near the former firing line at MRP Site 2. ICs would be implemented with the goal of maintaining protectiveness over the duration of the remedy. IC inspections and 5-year reviews would provide information to evaluate remedy effectiveness and support future restoration decisions. Existing fences and signage associated with the flight line and NAF El Centro Weapons Command would also prevent unauthorized human receptors from being exposure to contaminated soil. Alternative 2 would meet the RAO.

4.4.2.2 Compliance with ARARs

Alternative 2 is expected to meet potential chemical-, location-, and action-specific ARARs. A detailed analysis of potential ARARs associated with this RA alternative at MRP Site 2 is presented in **Appendix A**.

4.4.2.3 Long-Term Effectiveness and Permanence

ICs would be implemented to prohibit future residential use in the area of MRP Site 2 that does not meet the cleanup goal. Therefore, this alternative would meet the RAO. Alternative 2 would require IC inspections and reporting. IC inspections would be performed as needed to assess their continuing effectiveness. The long-term effectiveness of ICs would depend on continued

adherence to IC protocols. Additionally, while not installed specifically for MRP Site 2, existing fencing and signage would prevent unauthorized human exposure to contaminated soil at the site.

Alternative 2 would result in the generation of GHGs due to transportation of personnel for site inspections. GSR evaluation details are presented in **Appendix C**.

4.4.2.4 Reduction of Toxicity, Mobility, or Volume through Treatment

Alternative 2 does not meet the balancing criteria for reduction of toxicity, mobility, or volume through treatment. Alternative 2 involves no active treatment processes that would reduce the toxicity, mobility, or volume of lead-impacted soil.

4.4.2.5 Short-Term Effectiveness

Alternative 2 would require approximately 1 year to plan, 1 year to implement, 30 years of periodic inspections and reporting, and would meet the RAO in that timeframe. Field activities associated with this alternative (IC inspections) would result in minimal short-term impacts to the surrounding NAF El Centro operations (flight line and the NAF El Centro Munitions Command) and the surrounding community.

Burrowing owls are known to be present and burrow near MRP Site 2. Noise and workers being present onsite during the implementation of Alternative 2 would represent minimal short-term impacts to ecological sensitive species (e.g., burrowing owl) and their habitat because activities are limited to non-intrusive site visits by personnel performing the IC inspections.

A sustainability analysis was performed to provide a quantitative assessment of the potential environmental and social impact of each alternative. Alternative 2 would require transportation of personnel and onsite labor hours. Transportation of personnel comprises the entirety of the energy use and criteria air pollutants footprints. Both transportation of personnel and onsite labor hours would contribute to the risk footprints. GSR evaluation details are presented in **Appendix C**.

4.4.2.6 Implementability

Alternative 2 is implementable. ICs would not pose significant challenges to implementation.

4.4.2.7 Cost

The net present-value comparative cost of Alternative 2 is \$776,000. Most costs for this alternative are associated with IC inspections and 5-year reviews. A summary of the cost estimate for Alternative 2 is provided in **Table 4-2**. Refer to **Appendix B** for a more detailed cost summary breakdown for this alternative.

4.4.3 Alternative 3 – Excavation and Offsite Disposal

Under Alternative 3, lead-impacted soil within the remediation area (**Figure 4-1**) would be excavated and disposed of offsite. No long-term monitoring or annual inspections would be required. The components of this alternative are described in **Section 4.2.3**.

4.4.3.1 Overall Protection of Human Health and the Environment

Alternative 3 is expected to be effective in achieving the RAO by removing all lead-impacted soil at MRP Site 2 that does not meet the cleanup goal and poses a potentially unacceptable risk to hypothetical future residents. Excavated soil would be characterized for appropriate offsite disposal. Confirmation samples would be collected from the excavation to confirm the RAO is

met. No ICs, inspections, or maintenance are included for this alternative because it is intended to achieve unrestricted future use.

4.4.3.2 Compliance with ARARs

Alternative 3 is expected to meet potential chemical-, location-, and action-specific ARARs. A detailed analysis of potential ARARs associated with this RA alternative at MRP Site 2 is provided in **Appendix A**.

4.4.3.3 Long-Term Effectiveness and Permanence

Alternative 3 is expected to be effective in achieving the RAO by removing all soil with lead that does not meet the cleanup goal at MRP Site 2. Excavated soil would be characterized for appropriate offsite disposal. No ICs, inspections, or maintenance are included for this alternative because it is intended to achieve unrestricted future use.

Alternative 3 would result in the generation of GHGs primarily due to material production and handling of waste material. GSR evaluation details are presented in **Appendix C**.

4.4.3.4 Reduction of Toxicity, Mobility, or Volume through Treatment

Alternative 3 does not meet the balancing criteria for reduction of toxicity, mobility, or volume through treatment. The alternative involves no active treatment processes that would reduce the toxicity, mobility, or volume of lead-impacted soil.

4.4.3.5 Short-Term Effectiveness

Alternative 3 would require approximately 1 year to plan and 1 year to implement, and would meet the RAO in that timeframe. Field activities associated with this alternative (excavation and backfilling of an estimated 62 cubic yards of lead-impacted soil) would result in short-term impacts to the surrounding NAF El Centro operations (flight line and the NAF El Centro Munitions Command) and the surrounding community.

This alternative would have the potential to create noise and dust during the excavation and site restoration activities. Heavy equipment and other ancillary vehicles used for implementation of Alternative 3 have the potential to create noise and air emissions during excavation, site restoration, and offsite transportation of excavated soil. Field activities associated with this alternative would also pose risks to site workers because of inherent risks associated with excavation and handling of lead-impacted soil during earthwork activities. Noise, ground disturbance, and workers overall presence onsite would represent potential short-term impacts to ecological sensitive species (e.g., burrowing owl) and their habitat.

Dust generation would be mitigated with standard dust prevention and stormwater pollution prevention measures. Noise and air emissions would be mitigated to the extent feasible by such measures as pre-excavation design and schedule logistics, transporting soil during non-peak traffic periods, decontamination of vehicles leaving MRP Site 2, and other similar measures. Risks to workers would be mitigated by measures specified in the site health and safety plan that governs remediation activities. Biological surveying, monitoring, and avoidance and minimization measures would be conducted in accordance with the Integrated Natural Resources Management Plan (Tierra Data, 2014) to eliminate or reduce short-term impacts to ecological species and their habitat during implementation of this alternative. Additionally, any sensitive species potential habitat and burrows impacted as a result of such implementation would be restored after backfilling.

A sustainability analysis was performed to provide a quantitative assessment of the potential environmental and social impact of each alternative. Alternative 3 would require material production and equipment use, transportation of personnel, equipment, and residuals, and onsite labor hours. The greatest impacts to energy use and criteria air pollutants are from material production and residual handling during implementation of the remedy. Potable water use is from decontamination. Increased risk of injury to, or fatality of, workers would result primarily from onsite labor hours with lesser contributions from equipment transportation, personnel transportation, and handling of waste material. GSR evaluation details are presented in **Appendix C**.

4.4.3.6 Implementability

Alternative 3 is implementable. The excavation activities associated with Alternative 3 are not expected to pose significant challenges in implementation. Excavation and offsite disposal are common activities performed routinely at similar sites. The contractor performing construction activities would be required to follow stringent safety protocols established in the U.S. Army Corps of Engineers *Safety and Health Requirements Manual EM-385-1-1* (2014). Equipment and supplies are expected to be readily available. Handling of fill material is not expected to pose logistical and physical challenges. Identifying an acceptable nearby source of construction materials for the backfill material is not expected to pose a challenge to implementation. All activities would have to be coordinated with flight line operations and the NAF El Centro Munitions Command, which could result in delays and standbys during construction.

4.4.3.7 Cost

The net present-value comparative cost of Alternative 3 is \$213,000. Most costs for this alternative are associated with excavation and offsite transportation and disposal. A summary of the cost estimate for Alternative 3 is provided in **Table 4-3**. Refer to **Appendix B** for a more detailed cost summary breakdown for this alternative.

The uncertainties associated with the potential costs for this alternative are significantly higher than for the other alternatives considered in this EE/CA. This alternative could also lead to increased costs because of the need for additional labor resources, higher risk to personnel, more restrictive personal protective equipment, additional engineering controls to mitigate potential risks to onsite laborers, more and different equipment, or larger volume of lead-impacted soil than previously estimated.

Table 4-1. Summary of Detailed Analysis of Alternatives by Evaluation Criteria

Evaluation Criterion	Alternative 1 No Action	Alternative 2 Institutional Controls	Alternative 3 Excavation and Offsite Disposal
Overall Protection of Human Health and the Environment	Ineffective. Alternative 1 does not meet the RAO and therefore is not considered protective of human health and the environment. This alternative has no mechanisms to prevent receptor exposure impacted soil at MRP Site 2.	Moderately effective. ICs would prevent residential development and use, thereby preventing potentially unacceptable exposure to future hypothetical residents from impacted soils exceeding the cleanup goal at MRP Site 2. Existing fences and signage associated with the flight line and NAF El Centro Weapons Command would also prevent unauthorized human receptors from being exposed to impacted soil. Alternative 2 would meet the RAO.	Highly effective. Alternative 3 would remove impacted soil at MRP Site 2 that poses a potentially unacceptable risk to hypothetical future residents. No ICs, inspections, or maintenance are would be required because it is intended to achieve unrestricted future use. Alternative 3 would meet the RAO.
Compliance with ARARs	Would not comply with ARARs so it would not meet this criterion. No action would be implemented.	Meets ARARs. Alternative 2 is expected to meet potential chemical-, location-, and action-specific ARARs.	Meets ARARs. Alternative 3 is expected to meet potential chemical-, location-, and action-specific ARARs.
Long-Term Effectiveness and Permanence	Ineffective. Alternative 1 would not be effective because there would be no controls to prevent unacceptable exposure to lead-impacted soil. This alternative requires no maintenance, long-term management, or other action. Alternative 1 would not be permanent, and would not meet the RAO.	Moderately to effective. Alternative 2 would manage risk to future hypothetical residents by prohibiting residential development through ICs which would require routine inspections and monitoring over the long-term. Alternative 2 meets the RAO.	Highly effective. Alternative 3 would remove lead-impacted soil at MRP Site 2 that exceeds the cleanup goal and thus poses a potentially unacceptable risk to hypothetical future residents. No ICs, inspections, or maintenance would be required because the excavation undertaken for this alternative is intended to achieve UU/UE as the final remedy for MRP Site 2. Alternative 3 meets the RAO.

Table 4-1. Summary of Detailed Analysis of Alternatives by Evaluation Criteria

Evaluation Criterion	Alternative 1 No Action	Alternative 2 Institutional Controls	Alternative 3 Excavation and Offsite Disposal
Reduction in Toxicity, Mobility, and Volume Through Treatment	Ineffective. Alternative 1 includes no active treatment processes that would reduce toxicity, mobility, or volume of impacted soil.	Ineffective. Alternative 2 involves no active treatment processes that would reduce the toxicity, mobility, or volume of impacted soil.	Ineffective. Alternative 3 involves no active treatment processes that would reduce the toxicity, mobility, or volume of impacted soil. Segregation of metals debris during excavation would reduce the volume of materials transported offsite for disposal, but it would not be achieved through treatment.
Short-Term Effectiveness	Ineffective. Alternative 1 would not involve any construction, transportation-related impacts, noise, or other short-term impacts and would not cause increased risks to workers during implementation. However, Alternative 1 would never achieve the RAO, so the duration of the short term is indefinite.	Moderately effective. Alternative 2 would require approximately 1 year to plan and 2 months for implementation of the ICs and would meet the RAO in that timeframe. Field activities associated with this alternative would have minimal short-term impacts to the environment, would result in minimal amounts of vehicle and foot traffic. Alternative 2 would require the implementation of ICs in perpetuity. For cost purposes, it is assumed ICs would be implemented for 30 years. Additionally, noise and worker presence associated with Alternative 2 would represent potential short-term impacts to ecological sensitive species (e.g., burrowing owl) and their habitat.	Moderately effective. Alternative 3 would require approximately 1 year to plan and 6 to 9 months for the excavation and offsite disposal of the impacted soil and would meet the RAO in that timeframe. This alternative involves the excavation of approximately 62 cubic yards of lead-impacted soil. Field activities associated with this alternative would have a minor short-term impact to the environment and would result in a slight increase of vehicle and foot traffic during field work. This may cause some increased noise and traffic impacts to nearby NAF El Centro operations and the surrounding community. Field activities associated with this alternative would pose some risks to site workers because of inherent risks associated with excavation and handling of impacted soil. Additionally, Alternative 3 would represent potential short-term impacts to ecological sensitive species (e.g., burrowing owl) and their habitat, which would be restored after backfilling is completed. Biological monitoring would be performed before and during implementation of this alternative.

Table 4-1. Summary of Detailed Analysis of Alternatives by Evaluation Criteria

Evaluation Criterion	Alternative 1 No Action	Alternative 2 Institutional Controls	Alternative 3 Excavation and Offsite Disposal
Implementability	No action would be implemented.	Readily implementable and highly feasible. The annual IC inspections are not expected to pose significant challenges to implementation.	Readily implementable. The excavation activities associated with Alternative 3 are not expected to pose significant challenges in implementation. Excavation and offsite disposal are common activities performed routinely at similar sites. Equipment and supplies are expected to be readily available. All activities would have to be coordinated with flight line operations and the NAF El Centro Munitions Command, which could result in delays and standbys during construction.
Cost	No direct costs are incurred for the implementation of Alternative 1.	The present-value comparative cost of Alternative 2 is \$776,000. Most costs for this alternative are associated with annual IC inspections, fence maintenance and 5-year reviews.	The present-value comparative cost of Alternative 3 is \$213,000. Most costs for this alternative are associated with excavation and offsite transportation and disposal.

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Table 4-2. Cost Estimate Summary for Alternative 2: Institutional Controls

Description	Capital Cost with Markups ^a	Total Cost with Markups ^a
Capital Costs		
Development and Implementation of ICs	\$136,000	
Reporting		
LUC implementation plan	\$123,000	
Subtotal Capital Costs with Markups^a	\$259,000	
O&M Costs (30 years)		
IC Compliance Monitoring Reports	\$300,000	
Five-Year Reviews	\$168,000	
IC Modification	\$39,000	
Subtotal O&M Costs with Markups^a	\$507,000	
Subtotal with Markups^a	\$766,000	
Contingency (20%)	\$153,000	
Total Cost		\$919,000
Net Present-Value of Alternative 2 (based on 2019 dollars)^b		\$776,000

^a Markups include general conditions consisting of overall project management, overhead, bonds and insurance, home office support, taxes, and profit.

^b The net present-value of future cash flows was calculated using a real discount rate of 1.5 percent per year (adjusted for inflation) from Office of Management and Budget Circular A-94 Appendix C, revised November 2018. Values in this table are rounded.

Source: OMB, 2018

Note:

O&M = operation and maintenance

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Table 4-3. Cost Estimate Summary for Alternative 3: Excavation and Offsite Disposal

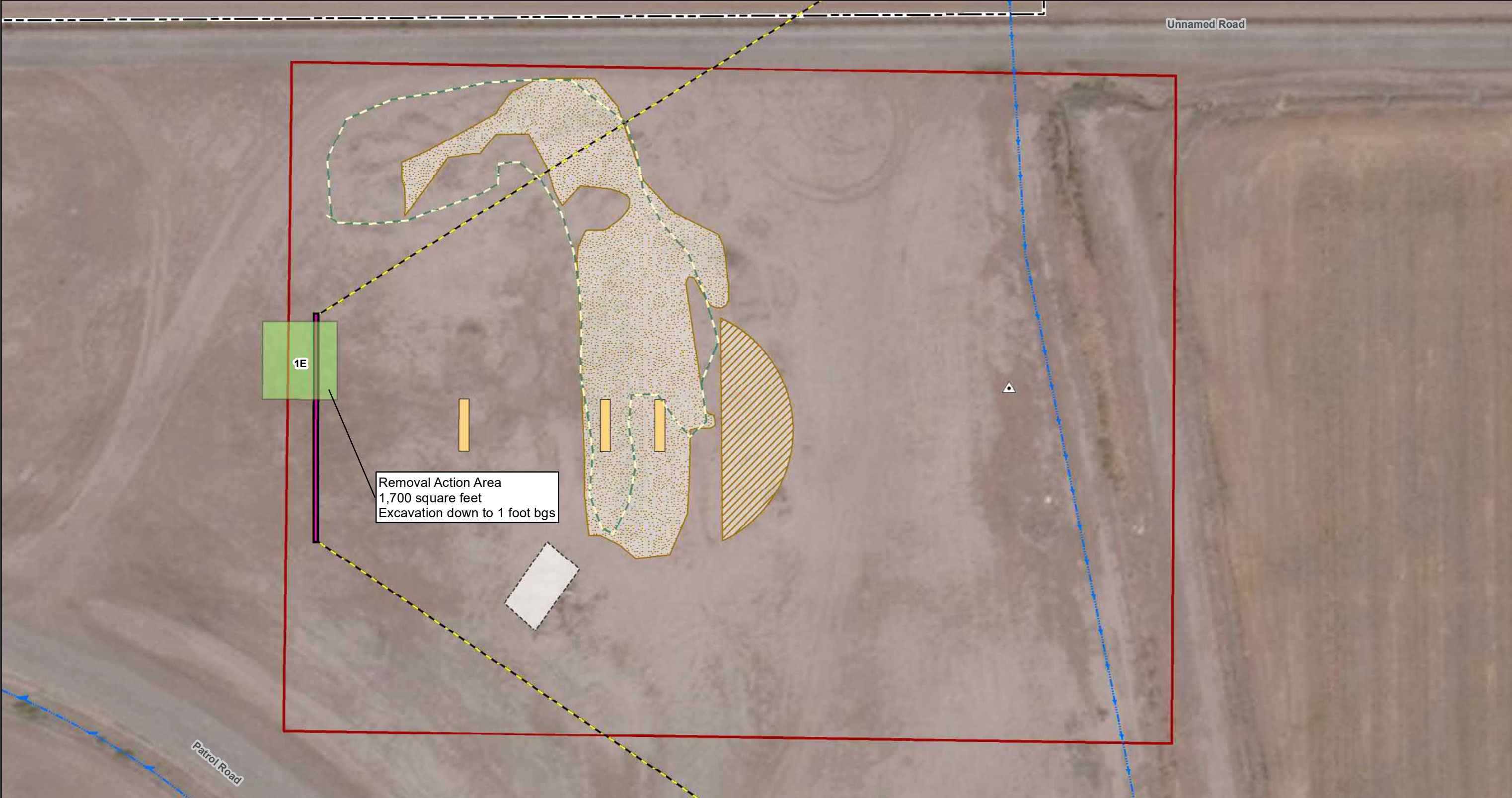
Description	Capital Cost with Markups ^a	Total Cost with Markups ^a
Capital Costs		
Biological Survey and Monitoring	\$46,000	
Remedial Design		
Remedial Design and Removal Action Work Plan	\$6,000	
Site Preparation	\$16,000	
Excavation	\$51,000	
Excavation		
Surface restoration		
Erosion and stormwater controls	\$5,000	
Hazardous waste handling and disposal	\$17,000	
NTCRA Report	\$39,000	
Subtotal Capital Costs with Markups^a	\$180,000	
Contingency (20%)	\$36,000	
Total Cost		\$216,000
Net Present-Value of Alternative 3 (based on 2019 dollars)^b		\$213,000

Source: OMB, 2018

^a Markups include general conditions consisting of overall project management, overhead, bonds and insurance, home office support, taxes, and profit.

^b The net present-value of future cash flows was calculated using a real discount rate of 1.5 percent per year (adjusted for inflation) from Office of Management and Budget Circular A-94 Appendix C, revised November 2018. Values in this table are rounded.

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LEGEND

Irrigation/Drainage Canal

Former Firing Line

Current Stockpile Extent

Removal Action Area

Surface Danger Zone

Former Target Stand

Former Location of Earthen Butt/Backstop Berm

Concrete/Metal Debris (Remains of Building 162)

Approximate Extent of Stockpiled Soil from Earthen Butt/Backstop Berm During the SI

MRP Site 2 Boundary

Installation Boundary

NOTES:
RI = Remedial Investigation
SI = Site Investigation
MRP = Munitions Response Program

DATA SOURCE:
- Battelle, SI, 10/2007

IMAGERY SOURCE:
ESRI ArcGIS Online Web Service,
NAIP, 06/06/2014

02550
Feet
1 inch = 50 feet

N

Figure 4-1
Removal Action Area
Engineering Evaluation/Cost Analysis for MRP Site 2
Naval Air Facility El Centro, El Centro, California

4-19

CH2M-9000-FZ08-0032

\\dc1w01\GIS\New\Clean\SOUTH\WEST\EL_CENTRO_NAF\MapFiles\FZ_008\MRP_02_04\IECA\008_1451.mxd 7/30/2020 LM046933_Jacobs

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5.0 Comparative Analysis of Alternatives

Based on the detailed analysis of each alternative (**Section 4.4**), a comparative analysis is presented to evaluate the relative performance of the three alternatives against each other and in relation to each specific evaluation criterion. A summary of the comparative analysis is presented in **Table 5-1**.

5.1 Overall Protection of Human Health and the Environment

All alternatives except Alternative 1 would meet this threshold criterion and can achieve the RAO. Alternative 3 is considered protective of human health and the environment because COC-impacted soil at concentrations above the cleanup goal would be removed from MRP Site 2 to achieve UU/UE. Alternative 3 would not require the implementation of ICs. Alternative 2 is considered protective of human health and the environment, as it would achieve the RAO by implementing ICs to prohibit residential use. Alternative 1 would not meet the RAO for protection of human health or the environment and is ranked the lowest.

5.2 Compliance with ARARs

Alternatives 2 and 3 are expected to meet identified potential ARARs. Alternative 3 would be subjected to the greatest number of ARARs because hazardous waste management, characterization, and disposal requirements would apply. However, these additional ARARs could be met by implementing standard industry practices and policies. ARARs do not apply to Alternative 1 because no action would be implemented.

5.3 Long-Term Effectiveness and Permanence

Alternative 3 ranks the highest for the long-term effectiveness and permanence criterion because it would remove COC-impacted soil that poses potentially unacceptable risk to hypothetical future residents, would not require long-term management, would be reliable over the long term, and would not need replacement components. Alternative 2 ranks the second highest because it would implement ICs to prohibit future residential use of MRP Site 2. Alternative 2 would require IC inspections and reporting. Alternative 2 ranks slightly lower than Alternative 3 for this criterion, because long-term effectiveness of ICs would depend on continued adherence to IC protocols. Alternative 1 ranks lower than the other alternatives because it would not reduce risk and would be less reliable over the long term. However, Alternative 1 would not require repairs or maintenance and would not result in GHG emissions.

5.4 Reduction of Toxicity, Mobility, or Volume through Treatment

Alternatives 1, 2, and 3 are ranked low for this criterion because they would not include treatment to reduce toxicity, mobility, or volume. The small volume of impacted soil (approximately 62 cubic yards) makes treatment options not as cost-effective as containment and removal options.

5.5 Short-Term Effectiveness

Alternative 1 would not result in short-term impacts to site workers or the local community, dust, or transportation impacts. Alternative 1 is rated high for this criterion. Alternative 2 is also rated high in short-term effectiveness because there would be very low short-term impacts to the surrounding community and the environment compared to Alternative 3. Alternative 3 is rated slightly lower than Alternative 2 for this criterion as field activities associated with this alternative would pose higher short-term impacts to site workers and the community than other active alternatives because of the inherent risks associated with excavation, segregation, and

transportation of COC-impacted soil. Field activities associated with Alternative 3 (excavation of approximately 62 cubic yards of lead-impacted soil) would pose slightly higher risk to the community, site workers, and sensitive ecological species than Alternative 2. Impacts to workers and the community could be mitigated through use of dust and erosion control methods, pre-design and schedule logistics, transporting soil during non-peak traffic periods, decontamination of vehicles leaving MRP Site 2, appropriate use of tarps during transport, and other similar measures. Risks to site workers would be mitigated by measures specified in the site health and safety plan and risks to sensitive ecological species would be mitigated by the implementation of biological surveying, monitoring, and avoidance and minimization measures.
















5.6 Implementability

Alternative 1 is rated high in implementability because it involves no action and would be easier to implement than other alternatives evaluated. Alternative 2 is also ranked high in implementability because preparation of an LUC implementation plan and implementation of ICs are routinely performed at Navy bases, and IC protocols are well established. However, Alternative 2 does include periodic inspections, reporting, and 5-year reviews. Alternative 3 is moderately difficult to implement in comparison to Alternative 2 because all activities would have to be coordinated with flight line operations and the NAF El Centro Munitions Command, which may result in delays and standbys during construction. However, Alternative 3 is rated moderate to high in implementability because excavation and offsite disposal are common activities performed routinely at similar sites. Identifying an acceptable nearby source of material for backfill is not expected to pose a challenge to implementation and equipment is expected to be readily available. For Alternative 3, approximately 3 truckloads of material would be transported offsite for disposal during implementation. Traffic impacts are expected to be minimal. Current activities on or near the site could be significantly impacted during implementation of Alternative 3.

5.7 Cost

A summary of costs for each alternative is presented in **Tables 4-2** and **4-3**. The values include the capital, O&M, and total present worth costs of each component for each alternative. Alternative 2 has the highest net present-value cost among the three alternatives, followed by Alternative 3. Alternative 1 does not have any associated costs. More detailed cost information and the cost estimating methodology are provided in **Appendix B**.

Table 5-1. Summary of Comparative Analysis of Alternatives

Alternative	Threshold Criteria ^a		Balancing Criteria				
	Overall Protection of Human Health and the Environment	Compliance with ARARs	Long-term Effectiveness and Permanence	Reduction of Toxicity, Mobility, or Volume through Treatment	Short-Term Effectiveness	Implementability	Cost ^b
Alternative 1 No Action	Does Not Meet	Does not Meet					 \$0
Alternative 2: ICs LUC Implementation Plan Development and implementation of ICs ICs inspections and routine reporting IC Compliance Monitoring Reports and Five-year reviews	Meets	Meets					 \$776,000
Alternative 3: Excavation and Offsite Disposal WP Biological survey and monitoring Excavation of 62 cubic yards of impacted soil Erosion and stormwater controls Confirmation sampling and analysis Transportation and disposal of impacted soil and pavement Backfilling and grading NTCRA Report	Meets	Meets					 \$213,000






^a Threshold Criteria (Overall protection of human health and the environment and compliance with ARARs) are evaluated as either meeting or not meeting these criteria.

^b Net Present-Value – See **Appendix C** for additional cost details. A high ranking indicates lower cost and a low ranking indicates higher cost.

Notes:

Modifying Criteria (State Acceptance and Community Acceptance) will be evaluated in the record of decision based on comments on the proposed plan.

Legend:

-  Low
-  Low to Moderate
-  Moderate
-  Moderate to High
-  High

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6.0 Recommended Alternative

This EE/CA was performed in accordance with current USEPA and Navy guidance documents for a NTCRA under CERCLA. The purpose of this EE/CA was to identify and analyze alternatives to address lead-containing soil at MRP Site 2 at NAF El Centro. Three alternatives were identified, evaluated, and compared:

- Alternative 1 – No Action
- Alternative 2 – ICs
- Alternative 3 – Excavation and Offsite Disposal

Based on the comparative analysis of the alternatives provided in this EE/CA, the recommended RA is Alternative 3 – Excavation and Offsite Disposal.

Alternative 3 would achieve the RAO, comply with ARARs, and mitigate the onsite risks to human health and the environment through the removal of lead-impacted soil. This alternative would also avoid the maintenance and monitoring costs because UU/UE would be achieved after the RA. This alternative is straightforward to implement, utilizing conventional construction methods, and resources.

Regulatory agencies had the opportunity to comment on the recommendation during the regulatory review period. **Appendix D** presents the response to comments from the regulatory agencies on the Draft EE/CA. Following the review period, a 30-day public comment period will be held to determine public acceptance of the recommended alternative. If public comments are received, a Responsiveness Summary addressing significant comments will be prepared as part of the AM and will be included in the Administrative Record.

The AM documents the process used to meet the CERCLA criteria for remedy-selection. A WP will be prepared to guide the RA. Pending post-removal conditions, no further action will be recommended and documented in an NTCRA Report. The NTCRA Report will be provided to regulatory agencies for review and approval.

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Appendix A

Potential Applicable or Relevant and Appropriate Requirements

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A.1 Introduction

This appendix identifies and evaluates potential federal and State of California applicable or relevant and appropriate requirements (ARARs) from the universe of regulations, requirements, and guidance. This document sets forth the Department of the Navy (Navy) determinations regarding those potential ARARs for each removal action alternative retained for detailed analysis in the Engineering Evaluation (EE)/Cost Analysis (CA) Report for Munitions Response Program (MRP) Site 2, Former Small Arms Range, Naval Air Facility El Centro, El Centro, California.

This evaluation includes an initial determination of whether the potential ARARs actually qualify as ARARs and a comparison for stringency between the federal and state regulations to identify the controlling ARARs. The identification of ARARs is an iterative process. The final determination of ARARs (no longer potential ARARs) will be made by the Navy in the Action Memorandum, after public review, as part of the removal action selection process.

A.1.1 Summary of CERCLA and NCP Requirements

Section 121(d) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) (42 United States Code [U.S.C.] Section [§] 9621[d]), as amended, states that remedial actions at CERCLA sites must attain (or the decision document must justify the waiver of) any federal or more stringent state environmental standards, requirements, criteria, or limitations determined to be legally applicable or relevant and appropriate. Although CERCLA § 121 does not itself expressly require that CERCLA removal actions comply with ARARs, the United States Environmental Protection Agency (USEPA) has promulgated a requirement in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) mandating that CERCLA removal action "...shall, to the extent practicable considering the exigencies of the situation, attain applicable or relevant and appropriate requirements under federal environmental or state environmental or facility siting laws" (Title 40 Code of Federal Regulations [40 CFR] § 300.415[j]). It is Navy policy to follow this requirement. Certain specified waivers may be used for removal actions, as is the case with remedial actions.

Applicable requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that specifically address circumstances at a CERCLA site. The requirement is applicable if the jurisdictional prerequisites of the standard show a direct correspondence when objectively compared to the conditions at the site. An applicable federal requirement is an ARAR. An applicable state requirement is an ARAR only if it is more stringent than federal ARARs.

If the requirement is not legally applicable, then the requirement is evaluated to determine whether it is relevant and appropriate. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that, while not applicable, address problems or situations similar to the circumstances of the proposed response action and are well suited to the conditions of the site (USEPA, 1988a). A requirement must be determined to be both relevant and appropriate to be considered an ARAR.

The criteria for determining relevance and appropriateness are listed in 40 Code of Federal Regulations (CFR) § 300.400(g)(2) and include the following:

- Purpose of both the requirement and the CERCLA action

- Medium regulated or affected by the requirement and the medium contaminated or affected at the CERCLA site
- Substances regulated by the requirement and the substances found at the CERCLA site
- Actions or activities regulated by the requirement and the response action contemplated at the CERCLA site
- Any variances, waivers, or exemptions of the requirement and their availability for the circumstances at the CERCLA site
- Type of place regulated and the type of place affected by the release or CERCLA action
- Type and size of structure or facility regulated and the type and size of structure or facility affected by the release or proposed in the CERCLA action
- Any consideration of use or potential use of affected resources in the requirement and the use or potential use of the affected resources at the CERCLA site

According to CERCLA ARARs guidance (USEPA, 1988a), a requirement may be “applicable” or “relevant and appropriate,” but not both. ARARs must be identified on a site-specific basis and involve a two-part analysis: first, a determination whether a given requirement is applicable; then, if it is not applicable, a determination whether it is both relevant and appropriate. It is important to explain that some regulations may be applicable or, if not applicable, may still be relevant and appropriate. When the analysis determines that a requirement is both relevant and appropriate, such a requirement must be complied with to the same degree as if it were applicable (USEPA, 1988a).

Tables included in this appendix present each potential ARAR with an initial determination of ARAR status (applicable or relevant and appropriate). For the determination of relevance and appropriateness, the pertinent criteria were examined to determine whether the requirements addressed problems or situations sufficiently similar to the circumstances of the release or response action contemplated and whether the requirement was well suited to the site. A negative determination of relevance and appropriateness indicates that the requirement did not meet the pertinent criteria. Negative determinations are discussed in the text only for specific cases.

To qualify as a state ARAR under CERCLA and the NCP, a state requirement must be:

- A state law or regulation
- An environmental or facility siting law or regulation
- Promulgated (of general applicability and legally enforceable)
- Substantive (not procedural or administrative)
- More stringent than federal requirements
- Identified in a timely manner
- Consistently applied

To constitute an ARAR, a requirement must be substantive. Therefore, only the substantive provisions of requirements identified as ARARs in this analysis are considered to be ARARs. Permits are considered to be procedural or administrative requirements. Provisions of generally relevant federal and state statutes and regulations that were determined to be procedural or nonenvironmental, including permit requirements, are not considered to be ARARs. CERCLA § 121(e)(1), 42 U.S.C. § 9621(e)(1), states, “No Federal, State, or local permit shall be required for the portion of any removal or remedial action conducted entirely on-site, where such action is

selected and carried out in compliance with this section.” The term *on-site* is defined for purposes of this ARAR’s discussion as “the areal extent of contamination and all suitable areas in very close proximity to the contamination necessary for implementation of the response action” (40 CFR § 300.5).

Nonpromulgated advisories or guidance issued by federal or state governments are not legally binding and do not have the status of ARARs. However, such requirements may be useful and are “to be considered.” “To be considered” requirements (40 CFR § 300.400[g][3]) complement ARARs but do not override them. They are useful for guiding decisions regarding cleanup levels or methodologies when regulatory standards are not available.

Pursuant to USEPA guidance (USEPA, 1988a), ARARs are generally divided into three categories: chemical-, location-, and action-specific requirements. This classification was developed to aid in the identification of ARARs; some ARARs do not fall precisely into one group or another. ARARs are identified on a site-specific basis for response actions where CERCLA authority is the basis for cleanup.

As the lead federal agency, the Navy has primary responsibility for identifying federal ARARs at MRP Site 2. Potential federal ARARs that have been identified for this EE/CA are discussed in **Section A.1.2.2**. Pursuant to the definition of the term *on-site* in 40 CFR § 300.5, the areas that are part of this action include all of MRP Site 2 as shown on Figure 2-2 of the EE/CA and areas in close proximity.

Identification of potential state ARARs was initiated through a Navy request to the State, an action described in more detail in **Section A.1.2.3**.

A.1.2 Methodology Description

The process of identifying and evaluating potential federal and state ARARs is described in this section.

A.1.2.1 General

As the lead federal agency, the Navy has primary responsibility for identification of potential ARARs for MRP Site 2. In preparing this ARARs analysis, the Navy undertook the following measures, consistent with CERCLA and the NCP:

- Identified federal ARARs for each response action alternative addressed in the EE/CA, taking into account site-specific information for MRP Site 2
- Reviewed potential ARARs identified by the state to determine whether they satisfy CERCLA and NCP criteria that must be met to constitute state ARARs
- Evaluated and compared federal ARARs and their state counterparts to determine whether state ARARs are more stringent than the federal ARARs or are in addition to the federally required actions
- Reached a conclusion as to which federal and state ARARs are the most stringent and/or controlling ARARs for each alternative

Section 3 of the main text of the EE/CA report identifies the removal action objectives for the MRP Site 2 removal action.

The removal action alternatives considered for detailed analysis, and for which an ARARs analysis is presented in this appendix, include the following:

- Alternative 1: No Action
- Alternative 2: Institutional Controls
- Alternative 3: Excavation and Offsite Disposal

A.1.2.2 Identifying and Evaluating Federal ARARs

As the lead federal agency under CERCLA and the NCP, the Navy is responsible for identifying federal ARARs. The final determination of federal ARARs will be made when the Navy issues the Record of Decision. The federal government implements a number of federal environmental statutes that are the source of potential federal ARARs, either in the form of the statutes or regulations promulgated thereunder. Examples include the Resource Conservation and Recovery Act (RCRA), the Clean Water Act (CWA), the Safe Drinking Water Act, the Toxic Substances Control Act, and their implementing regulations. See NCP preamble at 55 Federal Register (Fed. Reg.) 8764–8765 (1990) for a more complete list.

The Navy reviewed the proposed removal action alternatives against all potential federal ARARs, including but not limited to those set forth at 55 Fed. Reg. 8764–8765 (1990), to determine whether they were applicable, or relevant and appropriate, using the CERCLA and NCP criteria and procedures for ARARs identification by lead federal agencies.

A.1.2.3 Identifying and Evaluating State ARARs

The process of identifying and evaluating potential state ARARs by the state and the Navy is described in this section.

Solicitation of State ARARs Under NCP

USEPA guidance recommends that the lead federal agency consult with the state when identifying state ARARs for response actions (USEPA, 1988b). In essence, the CERCLA/NCP requirements at 40 CFR § 300.515 for response actions provide that the lead federal agency request that the state identify chemical- and location-specific state ARARs upon completion of site characterization. The requirements also provide that the lead federal agency request identification of all categories of state ARARs (chemical-, location-, and action-specific) upon completion of identification of response action alternatives for detailed analysis. The state must respond within 30 days of receipt of the lead federal agency requests. The remainder of this section documents the Navy's efforts to date to identify and evaluate state ARARs for MRP Site 2.

Chronology of Efforts to Identify State ARARs

The following chronology summarizes the Navy's efforts to obtain state assistance with identification of state ARARs for the removal action at MRP Site 2. Key correspondence between the Navy and the state agencies relating to this effort will be included in the Administrative Record for the Action Memorandum.

The Navy sent a letter to the State of California requesting potential state ARARs on January 6, 2020 (**Attachment A1**). The Navy received responses from the California Department of Toxic Substances Control, dated February 2020; the California Regional Water Quality Control Board, Colorado River Basin, dated April 2020; and the California Department of Fish and Wildlife, dated February 2020. These responses are included in **Attachment A2**. The Navy evaluated the potential state ARARs (**Attachment A3**) and included ARARs accepted by the Navy in this report.

A.1.3 Other General Issues

General issues identified during the evaluation of ARARs for MRP Site 2 are discussed in the following subsections.

A.1.3.1 General Approach to Requirements of the Federal Resource Conservation and Recovery Act

RCRA is a federal statute passed in 1976 to meet four goals: protection of human health and the environment, reduction of waste, conservation of energy and natural resources, and elimination of the generation of hazardous waste as expeditiously as possible. The Hazardous and Solid Waste Amendments of 1984 significantly expanded the scope of RCRA by adding new corrective action requirements, land disposal restrictions, and technical requirements. RCRA, as amended, contains several provisions that are potential ARARs for CERCLA sites.

Substantive RCRA requirements are applicable to response actions on CERCLA sites if the waste is a RCRA hazardous waste, and either of the following:

- The waste was initially treated, stored, or disposed of after the effective date of the particular RCRA requirement.
- The activity at the CERCLA site constitutes treatment, storage, or disposal as defined by RCRA (USEPA, 1988a).

The preamble to the NCP indicates that state regulations that are components of a federally authorized or delegated state program are generally considered federal requirements and potential federal ARARs for the purposes of ARARs analysis (55 Fed. Reg. 8666, 8742 [1990]). The State of California received approval for its base RCRA hazardous waste management program on July 23, 1992 (57 Fed. Reg. 32726 [1992]). The State of California "Environmental Health Standards for the Management of Hazardous Waste," set forth in Title 22 California Code of Regulations (Cal. Code Regs), Division 4.5 (Cal. Code Regs. Title [tit.] 22, Division 4.5), were approved by USEPA as a component of the federally authorized State of California RCRA program. On September 26, 2001, California received final authorization of its revised State Hazardous Waste Management Program from USEPA (63 Fed. Reg. 49118 [2001]).

The regulations of Cal. Code Regs. tit. 22, Division 4.5 are therefore a source of potential federal ARARs for CERCLA response actions. The exception is when a state regulation is broader in scope than the corresponding federal RCRA regulations. In that case, such regulations are not considered part of the federally authorized program or potential federal ARARs. Instead, they are purely state law requirements and potential state ARARs.

The USEPA notice of July 23, 1992, approving the State of California RCRA program (57 Fed. Reg. 32726 [1992]), specifically indicated that the state regulations addressed certain non-RCRA, state-regulated hazardous wastes that fell outside the scope of federal RCRA requirements. Cal. Code Regs. tit. 22, Division 4.5 requirements would be potential state ARARs for such non-RCRA, state-regulated wastes.

A key threshold question for the ARARs analysis is whether the contaminants at MRP Site 2 could constitute federal hazardous waste as defined under RCRA and the state's authorized program or qualify as non-RCRA, state-regulated hazardous waste. A discussion of waste characterization is provided in **Section A.1.4**.

A.1.4 Waste Characterization

Selection of ARARs involves the characterization of wastes as described in **Sections A.1.4.1 through A.1.4.3**.

A.1.4.1 RCRA Hazardous Waste Determination

Federal RCRA hazardous waste determination is necessary to determine whether a waste is subject to RCRA requirements at Cal. Code Regs. tit. 22, Division 4.5 and other state requirements at Cal. Code Regs. tit. 23, Division 3, Chapter 15. The first step in the RCRA hazardous waste characterization process is to evaluate contaminated media at the sites and determine whether the contaminant constitutes a listed RCRA waste. The preamble to the NCP states that “it is often necessary to know the origin of the waste to determine whether it is a listed waste and that, if such documentation is lacking, the lead agency may assume it is not a listed waste” (55 Fed. Reg. 8666, 8758 [1990]).

This approach is confirmed in USEPA guidance for CERCLA compliance with other laws (USEPA, 1988a) as follows:

To determine whether a waste is a listed waste under RCRA, it is often necessary to know the source. However, at many Superfund sites, no information exists on the source of wastes. The lead agency should use available site information, manifests, storage records, and vouchers in an effort to ascertain the nature of these contaminants. When this documentation is not available, the lead agency may assume that the wastes are not listed RCRA hazardous wastes, unless further analysis or information becomes available that allows the lead agency to determine that the wastes are listed RCRA hazardous wastes.

RCRA hazardous wastes that have been assigned USEPA hazardous waste numbers (or codes) are listed in Cal. Code Regs. tit. 22, §§ 66261.30–66261.33. The lists include hazardous waste codes beginning with the letters “F,” “K,” “P,” and “U.”

Knowledge of the exact source of a waste is required for source-specific listed wastes (K waste codes). Some knowledge of the nature or source of the waste is required even for listed wastes from nonspecific sources, such as spent solvents (F waste codes) used in particular processes, such as degreasing. Special rules apply to listed wastes designated as commercial chemical products (P and U waste codes). These RCRA hazardous waste listings are restricted to unused and unmixed commercial chemical products, typically spilled or off-specification products (USEPA, 1991a). Not every waste containing a P or U chemical is a listed hazardous waste. To determine whether soil containing a CERCLA hazardous substance meets the definition of a P or U waste, there must be direct evidence of the use of the specific commercial chemical product. In addition, the chemicals must meet all the following criteria:

- Discarded (as described in 40 CFR § 261.2[a][2]).
- Either off-specification commercial products or a commercially sold grade.
- Not used (i.e., only soil contaminated with spilled unused commercial chemicals is a P or U waste).
- If the spilled material was a mixture, the specified chemical must have been the sole active ingredient in a formulation.

Based on available knowledge, there are no listed wastes at the site. The Navy has not found any historical information indicating that the waste at MRP Site 2 is RCRA-listed waste.

The second step in the RCRA hazardous waste characterization process is to evaluate potential hazardous characteristics of the waste. The evaluation of characteristic waste is described in USEPA guidance as follows (USEPA, 1988a):

Under certain circumstances, although no historical information exists about the waste, it may be possible to identify the waste as RCRA-characteristic waste. This is important in the event that (1) remedial alternatives under consideration at the site involve onsite treatment, storage, or disposal, in which case RCRA may be triggered as discussed in this section; or (2) a remedial alternative involves offsite shipment. Since the generator (in this case, the agency or responsible party conducting the Superfund action) is responsible for determining whether the wastes exhibit any of these characteristics (defined in 40 CFR §§ 261.21–261.24), testing may be required. The lead agency must use best professional judgment to determine, on a site-specific basis, if testing for hazardous characteristics is necessary.

In determining whether to test for the toxicity characteristic using the extraction procedure (EP) toxicity test, it may be possible to assume that certain low concentrations of waste are not toxic. For example, if the total waste concentration in soil is 20 times or less the EP toxicity concentration, the waste cannot be characteristic hazardous waste. In such a case, RCRA requirements would not be applicable. In other instances, where it appears that the substances may be characteristic hazardous waste (ignitable, corrosive, reactive, or EP toxic), testing should be performed.

The identification of RCRA-characteristic waste is relevant to the alternatives evaluated in the EE/CA that will generate waste. Therefore, the Navy will characterize waste it generates to determine whether the waste is RCRA hazardous waste.

Hazardous waste characteristics, as defined in 40 CFR §§ 261.21–261.24, are commonly referred to as ignitability, corrosivity, reactivity, and toxicity. California environmental health standards for the management of hazardous waste set forth in Cal. Code Regs. tit. 22, Division 4.5 were approved by USEPA as a component of the federally authorized California RCRA program. Therefore, the characterization of RCRA waste is based on the state requirements.

The characteristics of ignitability, corrosivity, reactivity, and toxicity are defined in Cal. Code Regs. tit. 22, §§ 66261.21–66261.24. According to Cal. Code Regs. tit. 22, § 66261.24(a)(1)(A), “a waste that exhibits the characteristic of toxicity pursuant to subsection (a)(1) of this section has the USEPA hazardous waste number specified in Table I of this section which corresponds to the toxic contaminant causing it to be hazardous.” Table I assigns hazardous waste codes beginning with the letter “D” to wastes that exhibit the characteristic of toxicity; D waste codes are limited to “characteristic” hazardous wastes.

According to Cal. Code Regs. tit. 22, § 66261.10, waste characteristics can be measured by an available standardized test method or be reasonably classified by generators of waste based on their knowledge of the waste, provided that the waste has already been reliably tested or there is documentation of chemicals used.

The requirements at Cal. Code Regs. tit. 22, § 66261.24 list the toxic contaminant concentrations that determine the characteristic of toxicity. The concentration limits are in milligrams per liter. These units are directly comparable to total concentrations in waste groundwater and surface water. For waste soil, these concentrations apply to the extract or leachate produced by the toxicity characteristic leaching procedure (TCLP).

A waste is considered hazardous if the contaminants in the wastewater or in the soil TCLP extract equal or exceed the TCLP limits. TCLP testing is required only if total contaminant

concentrations in soil equal or exceed 20 times the TCLP limits because TCLP uses a 20-to-1 dilution for the extract (USEPA, 1988a).

A.1.4.2 California-regulated, Non-RCRA Hazardous Waste

A waste determined not to be a RCRA hazardous waste may still be considered a California-regulated, non-RCRA hazardous waste. The State of California RCRA program is broader in scope in its hazardous waste determination. Cal. Code Regs. tit. 22, § 66261.24(a)(2) lists the total threshold limit concentrations (TTLCs) and the soluble threshold limit concentrations (STLCs) for non-RCRA hazardous waste. The State of California applies its own leaching procedure, the Waste Extraction Test (WET), which uses a different acid reagent and has a different dilution factor (tenfold). There are other state requirements that may be broader in scope than federal ARARs for identifying non-RCRA wastes regulated by the state. These may be potential ARARs for wastes not covered under federal ARARs (see additional subsections of Cal. Code Regs. tit. 22, § 66261.24). A waste is considered hazardous if its total concentrations exceed the TTLCs or if the extract concentrations from the WET exceed the STLCs. A WET is required when the total concentrations exceed the STLC but are less than the TTLCs (Cal. Code Regs. tit. 22, Division 4.5, Chapter 11, Appendix II [b]).

A.1.4.3 Other California Waste Classifications

For waste discharged after July 18, 1997, solid waste classifications at Cal. Code Regs. tit. 27, §§ 20210, 20220, and 20230 are used to determine applicability of waste management requirements. These are summarized as follows:

- A “designated waste” under Cal. Code Regs. tit. 27, § 20210 is defined at California Water Code § 13173. Under California Water Code § 13173, designated waste is hazardous waste that has been granted a variance from hazardous waste management requirements or nonhazardous waste that consists of or contains pollutants that, under ambient environmental conditions at a waste management unit, could be released in concentrations exceeding applicable water quality objectives (WQOs), or that could reasonably be expected to affect beneficial uses of the waters of the state.
- A “nonhazardous solid waste” under Cal. Code Regs. tit. 27, § 20220 is all putrescible and nonputrescible solid, semisolid, and liquid wastes, including garbage, trash, refuse, paper, rubbish, ashes, industrial wastes, demolition and construction wastes, abandoned vehicles and parts thereof, discarded home and industrial appliances, manure, vegetable or animal solid and semisolid wastes, and other discarded waste (whether of solid or semisolid consistency), provided that such wastes do not contain wastes that must be managed as hazardous wastes or wastes that contain soluble pollutants in concentrations that exceed applicable WQOs or could cause degradation of waters of the state.
- Under Cal. Code Regs. tit. 27, § 20230, inert waste is that subset of solid waste that does not contain hazardous waste or soluble pollutants at concentrations in excess of applicable WQOs and does not contain significant quantities of decomposable waste.

A.2 Potential Chemical-specific ARARs

Potential chemical-specific ARARs are generally health- or risk-based numerical values or methodologies applied to site-specific conditions that result in the establishment of a cleanup level. Many potential ARARs associated with particular response alternatives (such as closure or discharge) can be characterized as action-specific but include numerical values or

methodologies to establish them; therefore, they fit into both categories (chemical- and action-specific). To simplify the comparison of numerical values, most action-specific requirements that include numerical values are included in this chemical-specific section, and if repeated in the action-specific section, the discussion refers back to this section.

This section presents the ARARs determination conclusions for soil. First is a summary of the potential ARARs followed by a more detailed discussion of the ARARs.

Potential federal chemical-specific ARARs are summarized in **Table A-1** and the potential state chemical-specific ARARs are presented in **Table A-2**.

A.2.1 Summary of Potential Soil ARARs

MRP Site 2 is approximately 4 acres and was used for small arms training and periodic re-qualification. Weapons use was limited to small arms, primarily small caliber (.22, .38, and .45-caliber and 9-millimeter). Soil is the medium of concern for MRP Site 2. Lead is present in the soil at concentrations that pose potential risk to hypothetical future residents.

Groundwater is not a medium of concern. Impacts to groundwater are not anticipated because of the suspected limited vertical migration in soil, low precipitation, high evaporation, and soil characteristics (low permeability, neutral to alkaline pH, and presence of organic matter). No natural surface water bodies are present on the site, so surface water is not a medium of concern. Air is similarly not a medium of concern; however, potential action-specific ARARs for emissions to air are triggered by the excavation evaluated in Alternative 3 and are identified and discussed in Section 4.0.

The Navy has identified the following potential federal chemical-specific ARARs for Alternative 3, which would generate waste for offsite disposal. The Navy would characterize waste, including waste munitions, in accordance with the following potential federal chemical-specific ARARs:

- Cal. Code Regs. tit. 22, §§ 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100 – defining a RCRA hazardous waste

The Navy has also accepted potential state chemical-specific ARARs for alternatives that generate waste for offsite disposal. The Navy would characterize the waste according to the following potential state chemical-specific ARAR:

- Cal. Code Regs. tit. 22, §§ 66261.3(a)(2)(C), 66261.3(a)(2)(F), 66261.22(a)(3) and (4), 66261.24(a)(2)–(a)(8), and 66261.101(a)(1) and (a)(2) – defining a non-RCRA state-regulated hazardous waste
- Cal. Code Regs. tit. 27, §§ 20210, 20220, and 20230 – defining a designated waste, nonhazardous solid waste, and an inert waste

The Military Munitions Rule 40 CFR Part 266 is not identified as a potential ARAR. Ammunition products produced or owned by the Department of Defense (DoD) are regulated under the Military Munitions Rule (62 Fed. Reg. 6621, February 12, 1997). The Military Munitions Rule identifies when conventional and chemical military munitions become a hazardous waste under RCRA. Munitions are defined in 40 CFR § 260.10, and the definition includes small arms ammunition. A military munition is classified as hazardous waste if it is either a listed waste or exhibits a hazardous characteristic. There are no listed munitions at MRP Site 2. Small arms ammunition (less than .50 caliber) has been determined not to be reactive according to the meaning of 40 CFR § 261.23 (USEPA, 1994). Small arms munitions may still exhibit the toxicity

characteristic based on lead. However, no munitions or explosives of concern are expected on MRP Site 2; only spent small arms ammunition is expected to remain on MRP Site 2. Therefore, the Military Munitions Rule is not identified as a potential ARAR.

A.2.2 Detailed Discussion of ARARs for Soil

No potential ARARs that present a numerical cleanup standard for lead are identified for MRP Site 2. Potential ARARs are identified for alternatives that would generate waste, including soil that is excavated for offsite disposal. The key threshold question for these potential ARARs is whether the waste would be classified as hazardous waste. The soil may be classified as federal hazardous waste as defined by RCRA and the state-authorized program or as non-RCRA, state-regulated hazardous waste. If the soil is determined to be hazardous waste, the appropriate requirements will apply.

A.2.2.1 Federal ARARs

RCRA Hazardous Waste

The federal RCRA requirements at 40 CFR Part 261 do not apply in California because the state RCRA program is authorized. The authorized state RCRA requirements are, therefore, considered potential federal ARARs (**Section A.1.4.1**). The applicability of RCRA requirements depends on whether the waste is a RCRA hazardous waste; whether the waste was initially treated, stored, or disposed of after the effective date of the particular RCRA requirement; and whether the activity at the site constitutes treatment, storage, or disposal as defined by RCRA. However, RCRA requirements may be relevant and appropriate even if they are not applicable. Examples include activities that are similar to the definition of RCRA treatment, storage, or disposal for waste that is similar to RCRA hazardous waste.

Determination of whether a waste is a RCRA hazardous waste can be made by comparing site waste to the definition of RCRA hazardous waste. RCRA requirements at Cal. Code Regs. tit. 22, §§ 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100 are potential ARARs because they define RCRA hazardous waste. A waste can meet the definition of hazardous waste if it is ignitable, corrosive, reactive, or toxic. The determination of toxicity characteristic waste is made by using the TCLP. The maximum concentrations allowable for the TCLP listed in § 66261.24(a)(1)(B) are potential federal ARARs for determining whether the waste is RCRA toxicity characteristic hazardous waste. Pursuant to the following California Code of Regulations, if the site waste has concentrations exceeding these values, it is determined to be a characteristic RCRA hazardous waste (**Section A.1.4.1**):

- Cal. Code Regs. tit. 22, §§ 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100 – defining a RCRA hazardous waste.

A.2.2.2 State ARARs

RCRA Hazardous Waste

State RCRA requirements included within the USEPA-authorized RCRA program for California are considered to be potential federal ARARs and are discussed in Section A.2.2.1. The exception is when a state regulation is broader in scope than the corresponding federal RCRA regulations. In that case, such regulations are not considered part of the federally authorized program or potential federal ARARs. Instead, they are purely state law requirements and potential state ARARs.

State requirements, such as the non-RCRA, state-regulated hazardous waste requirements may be potential state ARARs because they are not within the scope of the federal ARARs (57 Fed. Reg. 60848). The requirements at Cal. Code Regs. tit. 22, §§ 66261.3(a)(2)(C), 66261.3(a)(2)(F), 66261.22(a)(3) and (4), 66261.24(a)(2)–(a)(8), and 66261.101(a)(1) and (a)(2) are part of the state-approved RCRA program and would be potential state ARARs for non-RCRA, state-regulated hazardous wastes.

Cal. Code Regs. tit. 27, Division 2, Subdivision 1

Former Cal. Code Regs. tit. 23, division 3, chapter 15 requirements were repealed and went into effect under Cal. Code Regs. tit. 27 on July 18, 1997. The following Cal. Code Regs. tit. 27 sections define waste characteristics for discharge of waste to land. These requirements may be applicable for soil left in place that was discharged after the effective date of the requirements. They are not potentially applicable to discharges before that date but may be relevant and appropriate.

Cal. Code Regs. tit. 27, § 20230(a) defines inert waste as waste “that does not contain hazardous waste or soluble pollutants at concentrations in excess of applicable WQOs and does not contain significant quantities of decomposable waste.” Cal. Code Regs. tit. 27, § 20230(b) states, “inert wastes do not need to be discharged at classified waste management units.” Cal. Code Regs. tit. 27, § 20230 is a potential state ARAR for waste that meets the definition of inert waste.

Cal. Code Regs. tit. 27, §§ 20210 and 20220 are state definitions for designated waste and nonhazardous waste, respectively. These are potential ARARs for waste that meets the definitions. These waste classifications determine state classification and siting requirements for discharging waste to land.

A.3 Potential Location-specific ARARs

In general, potential location-specific requirements are associated with eight protected or regulated resource categories. These resource categories are cultural resources, wetlands, floodplains, hydrologic resources, biological resources, coastal resources, geological characteristics of the site, and other natural resources. Biological resources are the only protected and regulated resource present at MRP Site 2. The Ecological Risk Assessment concluded that chemicals in soil are below levels that would be expected to pose risk to ecological receptors (CH2M, 2019). Potential federal location-specific ARARs are summarized in **Table A-3**.

A.3.1 Federal ARARs

The following potential federal biological resources ARARs were identified based on the presence or potential presence of migratory birds. No threatened or endangered species are present or potentially at MRP Site 2.

Migratory Bird Treaty Act of 1972

The Migratory Bird Treaty Act (16 U.S.C. §§ 703–712) prohibits at any time, using any means or manner, the pursuit, hunting, capturing, and killing or attempting to take, capture, or kill any migratory bird. This act also prohibits the possession, sale, export, and import of any migratory bird or any part of a migratory bird, as well as nests and eggs. A list of migratory birds for which this requirement applies is found at 50 CFR § 10.13. It is the Navy’s position that this act is not legally applicable to Navy actions. However, Executive Order 13186 (dated January 10, 2001) requires each federal agency taking actions that have or are likely to have a measurable effect

on migratory bird populations to develop and implement, within 2 years, a Memorandum of Understanding (MOU) with the United States Fish and Wildlife Service to promote the conservation of the populations. In September 2014, the DoD signed an MOU with the United States Fish and Wildlife Service (DoD, 2014). The MOU describes DoD's responsibilities with respect to conservation of migratory birds for all DoD activities, including hazardous waste cleanup.

The substantive provisions of 16 U.S.C. § 703 are identified as potential ARARs because of the presence or potential presence of migratory birds at MRP Site 2, including burrowing owls. Potential ecological risks were evaluated for MRP Site 2. The Ecological Risk Assessment concluded that concentrations of chemicals in soil are below levels that would be expected to pose ecological risk. Before beginning any remedial action that calls for earthmoving at MRP Site 2, the Navy will conduct a survey to determine whether burrowing owls are present and would be adversely affected by the remedial action. If so, the Navy will develop appropriate measures to protect the burrowing owls.

A.3.2 State ARARs

California Fish and Game Code §§ 1908, 2080, and 3511

California Fish and Game Code §§ 1908, 2080, and 3511 are not accepted as potential state ARARs because no state rare or threatened plants, no state threatened or endangered species, and no state fully protected species are on MRP Site 2.

California Fish and Game Code §§ 3005 and 3503 and Cal. Code Regs. tit. 14, § 460

The Navy does not accept California Fish and Game Code §§ 3005 or 3503 or Cal. Code Regs. tit. 14, § 460. These requirements are not applicable because the United States of America has not waived sovereign immunity in the federal Endangered Species Act for this State of California requirement. Pursuant to 40 CFR § 300.400(g)(2) of the NCP, the Navy has determined that this requirement is not relevant and appropriate because it does not address problems or situations sufficiently similar to the circumstances of the release or CERCLA response action, and is not well suited to the site based upon the pertinent provisions of the NCP at 40 CFR § 300.400(g)(2)(i) and (iv). CERCLA response actions are intended to respond to releases of hazardous substances to protect human health and the environment, including environmental receptors. In contrast, the purpose of this state requirement is to regulate and set forth conditions for the "taking" of the species addressed by the requirement. Moreover, that purpose is achieved through the regulations of intentional conduct directed at the species as opposed to incidental "take" (or possession, etc.) of species in the course of lawful activity such as CERCLA remedial action. The focus on intentional conduct is not well suited to the circumstances at CERCLA sites. In summary, the purposes of this state requirement and the actions that it regulates do not include responding to releases of hazardous substances. Therefore, it is not relevant and appropriate based upon the pertinent provisions of the NCP at 40 CFR § 300.400(g)(2)(i) and (iv).

Although these requirements are not potential ARARs, the Navy will coordinate with other natural resource trustees throughout the CERCLA remedial action process. The Navy's Ecological Risk Assessment process considers representative environmental receptors for the site. In addition, any species that are present and are federal and/or state endangered, threatened, or fully protected species will be addressed by ARARs related to those designations.

California Fish and Game Code §§ 3503.5 and 3513

The State of California has withdrawn its previous identification of this requirement as a state ARAR in light of the Navy's identification of the substantive provisions of the Migratory Bird Treaty Act as a relevant and appropriate federal ARAR for this action.

California Fish and Game Code § 5650

California Fish and Game Code § 5650 is not accepted as a potential state ARAR. There is an irrigation drainage canal on the site. However, the drainage canal is no longer being used since irrigation has been suspended. Therefore, the Navy's remedial activities will not impact water in the irrigation drainage canal. In addition, the Navy has identified stormwater requirements for construction activities as potential ARARs. These requirements will prevent materials from entering the irrigation drainage.

California Code of Regulations

The Navy does not accept Cal. Code Regs. tit. 14, §§ 3703, 15380(d), 15063, or 15065 as ARAR or "to be considered" (TBC) criteria. Cal. Code Regs. tit. 14, § 3703 is applicable to reclaiming mined land, which is an activity not occurring at MRP Site 2. The regulation is not relevant or appropriate because the activities associated the regulation are different than activities associated with a CERCLA response action. The regulation is not necessary as TBC criteria because there are adequate statutory and regulatory provisions to protect and address ecological receptors. The other regulations are procedural requirements and procedural requirements are not ARARs.

California Fish and Game Commission Wetland Policy

The Navy does not accept the wetland policy as a potential ARAR or TBC. There are no wetlands on or near the site.

A.4 Potential Action-specific ARARs

This EE/CA evaluates three removal action alternatives for MRP Site 2. The removal action alternatives are as follows:

- Alternative 1: No Action
- Alternative 2: Institutional Controls
- Alternative 3: Excavation and Offsite Disposal

Sections A.4.1 through A.4.3 describe the potential federal action-specific ARARs for the response action alternatives evaluated in the EE/CA. **Table A-4** summarizes the potential federal action-specific ARARs and **Table A-5** summarizes the potential state action-specific ARARs.

A.4.1 Alternative 1: No Action

There is no need to identify action-specific ARARs for the no action alternative because ARARs apply to "any removal or remedial action conducted entirely on-site" and "no action" is not a removal or remedial action (CERCLA § 121[e], 42 U.S.C. § 9621[e]). CERCLA § 121 (42 U.S.C. § 9621) cleanup standards for selection of a Superfund remedy, including the requirement to meet action-specific ARARs, are not triggered by the no action alternative (USEPA, 1991b). Therefore, a discussion of compliance with potential action-specific ARARs is not appropriate for this alternative.

A.4.2 Alternative 2: Institutional Controls

Alternative 2 consists of the implementation of ICs to prohibit future residential development and use of the removal target area of MRP Site 2. The following is a list of the main components of Alternative 2:

- Planning documents
- Institutional controls
- Reporting

Please refer to Section 4.2.2 of the EE/CA for additional details about the components for Alternative 2.

A.4.2.1 Federal ARARs

Institutional Controls

There are no potential federal action-specific ARARs for ICs.

A.4.2.2 State ARARs

Institutional Controls

The Navy accepts the following potential state ARAR for ICs because entering into and recording a land use covenant is infeasible for MRP Site 2:

- The requirement to record land use restrictions in base Master Plans at Cal. Code Regs. tit. 22, § 67391.1(e)(2)

A.4.3 Alternative 3: Excavation and Offsite Disposal

Alternative 3 would excavate lead-impacted soil with lead concentrations that exceed the cleanup goal and dispose of the soil offsite. The extent of the excavation of lead-impacted soil (removal target area) is shown on Figure 4-1 of the EE/CA. The following is a list of the main components of Alternative 3:

- Planning documents
- Site preparation
- Biological survey, monitoring, and avoidance and minimization measures
- Excavation and offsite disposal
- Post-excavation confirmation sampling
- Site restoration
- Reporting

Please refer to Section 4.2.3 of the EE/CA for additional details about the components for Alternative 3.

A.4.3.1 Federal ARARs

Excavation

The Navy has identified the following potential federal action-specific ARARs for characterizing the excavated soil/waste generated in the excavation for offsite disposal:

- RCRA hazardous waste identification requirements, at Cal. Code Regs. tit. 22, §§ 66262.10(a) and 66262.11

- The requirement to analyze generated waste to determine whether it is hazardous, at Cal. Code Regs. tit. 22, § 66264.13(a) and (b)
- If the waste is RCRA hazardous waste, the RCRA requirement for the initial generator of waste to determine the applicable USEPA hazardous waste number, at Cal. Code Regs. tit. 22, § 66268.9(a)

Excavated soil/waste would be placed in temporary containers, then characterized for offsite disposal. The excavated soil is not expected to be RCRA-characteristic hazardous waste based on in situ sampling. So, the Navy has identified the following potential ARARs for the containers as relevant and appropriate:

- Requirements for containers for RCRA hazardous waste, at Cal. Code Regs. tit. 22, §§ 66264.171–66264.174, 66264.175(a) and (b), and 66264.178

The excavation will affect more than 1 acre, so the following stormwater controls for construction activities under the CWA are identified as potential ARARs:

- The requirements to implement stormwater best management practices at CWA 33 U.S.C. § 1342 and 40 CFR § 122.44(k)(2) and (4)
- The requirements for sampling and analysis under the CWA at 40 CFR Part 136

The following requirements promulgated by the Imperial County Air Pollution Control District (ICAPCD) under the Clean Air Act to control fugitive dust at construction sites and during earthmoving activities are identified as potential federal action-specific ARARs:

- The requirement to limit visible dust emissions during construction and earthmoving to 20 percent opacity by using pre-activity, active-operation, and stabilization-during-inactivity best available control measures for fugitive dust at ICAPCD Rule 801(E) and (F)
- The requirement to limit visible dust emissions during bulk material handling, storage, and transport to 20 percent opacity by using best available control measures for fugitive dust at ICAPCD Rule 802(E) and (F)

A.4.3.2 State ARARs

Removal Action

The Navy accepts the following potential state action-specific ARAR:

- Actions taken by public agencies to cleanup unauthorized releases are generally exempt from Title 27, except that wastes removed from the immediate place of release and discharges to land must be managed in accordance with classification at Cal. Code Regs. tit. 27, § 20090

Excavation

The Navy accepts the following potential state action-specific ARAR for characterizing waste:

- The requirement to accurately characterize waste at Cal. Code Regs. tit. 27, § 20200(c)

Although not an ARAR or TBC, the Navy would use State Water Resources Control Board Order 2009-0009-DWQ, as amended by 2010-0014-DWQ and 2012-0006-DWQ, as a means of complying with the potential ARARs identified for stormwater discharge associated with construction activities.

A.5 References

CH2M HILL, Inc. (CH2M). 2019. *Remedial Investigation Report for Munitions Response Sites 2 and 4, Naval Air Facility El Centro, El Centro, California*. Final. September.

United States Environmental Protection Agency (USEPA). 1988a. *CERCLA Compliance with Other Laws Manual, Draft Guidance*. EPA/540/G-89/006, Office of Emergency and Remedial Response, Washington, D.C. August.

USEPA. 1988b. *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA*. Office of Solid Waste and Emergency Response Directive 9355.3-01, -02. EPA/540/G-89/004. October.

USEPA. 1991a. *Management of Investigation-Derived Wastes During Site Inspections*. EPA/540/G-91/009. May.

USEPA. 1991b. *ARARs Q's and A's: General Policy, RCRA, CWA, SDWA, Post-ROD Information, and Contingent Waivers*. Office of Solid Waste and Emergency Response Directive No. 9234.2-01/FS-A. Washington, D.C. June.

USEPA. 1994. *Classification of Small Arms Ammunition with Respect to Reactivity*. Office of Solid Waste and Emergency Response Directive No. 9443.10(84), November 30, 1984.

Tables

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Table A-1. Potential Federal Chemical-specific Applicable or Relevant and Appropriate Requirements

Requirement	Prerequisite	Citation ^a	Preliminary ARAR Determination	Comments
SOIL				
Resource Conservation and Recovery Act (42 U.S.C., Chapter 82, §§ 6901–6991[i])^b				
Defines RCRA hazardous waste. A solid waste is characterized as toxic, based on the TCLP, if the concentration exceeds the TCLP maximum concentrations.	Waste	Cal. Code Regs. tit. 22, §§ 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100	Applicable	The substantive provisions of these requirements are potentially applicable to activities that generate waste. The Navy would characterize the waste, including excavated soil for offsite disposal, at the time it is generated.

^a Only the substantive provisions of the requirements cited in this table are potential ARARs.

^b Statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the Navy accepts the entire statutes or policies as potential ARARs. Specific potential ARARs are addressed in the table below each general heading.

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Table A-2. Potential State Chemical-specific Applicable or Relevant and Appropriate Requirements

Requirement	Prerequisite	Citation ^a	Preliminary ARAR Determination	Comments
SOIL				
California Department of Toxic Substances Control^b				
Defines non-RCRA state-regulated hazardous wastes	Waste	Cal. Code Regs. tit. 22, §§ 66261.3(a)(2)(C) and (F), 66261.22(a)(3) and (4), 66261.24(a)(2)–(a)(8), and 66261.101(a)(1) and (a)(2)	Applicable	The substantive provisions of these requirements are potentially applicable to activities that generate waste. The waste would be characterized prior to offsite disposal.
State and Regional Water Quality Control Boards				
Defines designated waste, nonhazardous waste, and inert waste	Waste	Cal. Code Regs. tit. 27, §§ 20210, 20220, and 20230	Applicable	The substantive provisions of these requirements are potentially applicable to activities that generate waste. All alternatives, except Alternative 1, would generate waste. The waste would be characterized prior to offsite disposal.

^a Only the substantive provisions of the requirements cited in this table are potential ARARs.

^b Statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the Navy accepts the entire statutes or policies as potential ARARs. Specific potential ARARs are addressed in the table below each general heading.

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Table A-3. Potential Federal Location-specific Applicable or Relevant and Appropriate Requirements

Location	Requirement	Prerequisite	Citation ^a	Preliminary ARAR Determination	Comments
Migratory Bird Treaty Act (16 U.S.C. §§ 703–712)^b					
Migratory bird area	Protects almost all species of native migratory birds in the United States from unregulated “take,” which can include poisoning at hazardous waste sites.	Presence of migratory birds	16 U.S.C. § 703	Relevant and appropriate	The substantive provisions of this section are potentially relevant and appropriate because migratory birds, including burrowing owls, may be present at MRP Site 2. An Ecological Risk Assessment completed for MRP Site 2 concluded that concentrations of chemicals in soil are below levels expected to pose risk to ecological receptors. The Navy will conduct a survey of MRP Site 2 before earthmoving activities begin to determine whether burrowing owls are present and will be affected by the activities. If so, the Navy will determine appropriate measures to protect the burrowing owls.

^a Only the substantive provisions of the requirements cited in this table are potential ARARs.

^b Statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the Navy accepts the entire statutes or policies as potential ARARs. Specific potential ARARs are addressed in the table below each general heading.

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Table A-4. Potential Federal Action-specific Applicable or Relevant and Appropriate Requirements

Removal Action Alternatives: 1 – No Action; 2 – ICs; 3 – Excavation and Offsite Disposal							
Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination ^a			Comments
				A	RA	TBC	
Resource Conservation and Recovery Act (42 U.S.C. §§ 6901–6991[i]) ^b							
Generate waste	A person who generates waste shall determine whether the waste is a RCRA hazardous waste.	Generator of waste	Cal. Code Regs. tit. 22, §§ 66262.10(a) and 66262.11	3			These regulations are potentially applicable to the generation of waste for offsite disposal, including the excavation of soil. The Navy will determine whether the waste soil is RCRA hazardous waste when it is generated.
Generate waste	Provides requirements for analyzing waste for determining whether waste is hazardous.	Generator of waste	Cal. Code Regs. tit. 22, § 66264.13(a) and (b)	3			These regulations are potentially applicable to the generation of waste for offsite disposal, including the excavation of soil. The Navy will determine whether the waste soil is RCRA hazardous waste when it is generated.
Store waste in containers	Containers of RCRA hazardous waste must be: <ul style="list-style-type: none">• Maintained in good condition• Compatible with hazardous waste to be stored• Closed during storage except to add or remove waste	Storage of RCRA hazardous waste not meeting small-quantity generator criteria before treatment, disposal, or storage elsewhere, in a container	Cal. Code Regs. tit. 22, § 66264.171–66264.173		3		Excavated soil and waste will be temporarily stored in containers and characterized for offsite disposal. Based on the in situ sampling completed at MRP Site 2, the soil is not expected to be RCRA hazardous. Therefore, the requirements are identified as potentially relevant and appropriate.

Table A-4. Potential Federal Action-specific Applicable or Relevant and Appropriate Requirements

Removal Action Alternatives: 1 – No Action; 2 – ICs; 3 – Excavation and Offsite Disposal							
Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination ^a			Comments
				A	RA	TBC	
Store waste in containers	Inspect container storage areas weekly for deterioration.	Storage of RCRA hazardous waste not meeting small-quantity generator criteria before treatment, disposal, or storage elsewhere, in a container	Cal. Code Regs. tit. 22, § 66264.174		3		Excavated soil and waste will be temporarily stored in containers and characterized for offsite disposal. Based on the in situ sampling completed at MRP Site 2, the soil is not expected to be RCRA hazardous. Therefore, the requirements are identified as potentially relevant and appropriate.
Store waste in containers	Place containers on a sloped, crack-free base, and protect from contact with accumulated liquid. Provide containment system with a capacity of 10 percent of the volume of containers of free liquids.	Storage of RCRA hazardous waste not meeting small-quantity generator criteria before treatment, disposal, or storage elsewhere, in a container	Cal. Code Regs. tit. 22, § 66264.175(a) and (b)		3		Excavated soil and waste will be temporarily stored in containers and characterized for offsite disposal. Based on the in situ sampling completed at MRP Site 2, the soil is not expected to be RCRA hazardous. Therefore, the requirements are identified as potentially relevant and appropriate.
Store waste in containers	At closure, remove all hazardous waste and residues from the containment system and decontaminate or remove all containers and liners.	Storage of RCRA hazardous waste not meeting small-quantity generator criteria before treatment, disposal, or storage elsewhere, in a container	Cal. Code Regs. tit. 22, § 66264.178		3		Excavated soil and waste will be temporarily stored in containers and characterized for offsite disposal. Based on the in situ sampling completed at MRP Site 2, the soil is not expected to be RCRA hazardous. Therefore, the requirements are identified as potentially relevant and appropriate.

Table A-4. Potential Federal Action-specific Applicable or Relevant and Appropriate Requirements

Removal Action Alternatives: 1 – No Action; 2 – ICs; 3 – Excavation and Offsite Disposal							
Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination ^a			Comments
				A	RA	TBC	
Generate waste	The initial generator of a waste shall determine each USEPA hazardous waste code to determine the applicable treatment standards, which may be made concurrently with the hazardous waste determination required in § 66262.11.	Waste	Cal. Code Regs. tit. 22, § 66268.9(a)	3			The Navy will generate waste for offsite disposal in Alternative 3. The Navy will characterize this waste and, if hazardous, will determine the USEPA waste code to determine applicable treatment standards.
Clean Water Act (33 U.S.C.§§ 1251–1387) ^b							
Discharge, including storm water, to surface water	Owners and operators of construction activities must comply with discharge standards, including substantive provisions of the general requirements for stormwater plans and best management practices (BMPs).	Construction activity that affects at least 1 acre	33 U.S.C. § 1342 and 40 CFR § 122.44(k)(2) and (4)	3			Construction activities in Alternative 3 will affect more than 1 acre; therefore, stormwater controls are necessary.
Discharge, including stormwater, to surface water	Sampling and analysis requirements	Discharge under the CWA	40 CFR Part 136	3			These requirements are potential ARARs for sampling and analysis associated with stormwater discharges associated with construction activity in Alternative 3.

Table A-4. Potential Federal Action-specific Applicable or Relevant and Appropriate Requirements

Removal Action Alternatives: 1 – No Action; 2 – ICs; 3 – Excavation and Offsite Disposal							
Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination ^a			Comments
				A	RA	TBC	
Clean Air Act (42 U.S.C. § 7401–7671) ^b							
Excavate soil	Visible dust emissions during construction and earthmoving must be limited by using pre-activity, active-operation, and stabilization-during-inactivity best available control measures.	Construction or earthmoving	ICAPCD Rule 801(E) and (F)	3			The Navy would use the best available dust control measures in the excavation of soil evaluated in Alternative 3.
Excavate soil	Visible dust emissions during bulk material handling, storage, and transport must be limited using best available control measures.	Bulk material handling, storage, or transport	ICAPCD Rule 802(E) and (F)	3			The Navy would use the best available dust control measures in the excavation of soil evaluated in Alternative 3.

^a The numbers in the A (applicable), RA (relevant and appropriate), or TBC (to be considered) columns correspond to the alternatives for which the requirement is a potential ARAR.

^b Statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the Navy accepts the entire statutes or policies as potential ARARs. Specific potential ARARs follow each general heading, and only substantive requirements of the specific citations are considered potential ARARs.

Notes:

A applicable
 IC institutional control
 ICAPCD Imperial County Air Pollution Control District
 RA relevant and appropriate

Table A-5. Potential State Action-specific Applicable or Relevant and Appropriate Requirements

Removal Action Alternatives: 1 – No Action; 2 – ICs; 3 – Excavation and Offsite Disposal							
Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination ^a			Comments
				A	RA	TBC	
State and Regional Water Quality Control Boards ^b							
Removal action at MRP Site 2	Actions taken by public agencies to cleanup unauthorized releases are generally exempt from Title 27, except that wastes removed from the immediate place of release and discharges to land must be managed in accordance with classification and siting requirements of Title 27.	Action taken by a public agency to address the release of solid waste	Cal. Code Regs. tit. 27, § 20090		3		This requirement is relevant and appropriate to the cleanup actions the Navy is taking at MRP Site 2.
Generate waste	Dischargers are required to accurately characterize waste	Generator of waste	Cal. Code Regs. tit. 27, § 20200(c)	3			These regulations are potentially applicable to the generation of waste for offsite disposal, including the excavation of soil. The Navy will determine whether the waste soil is designated waste, nonhazardous solid, or inert waste at the time it is generated.
Construction and land disturbance	Most non-stormwater discharges are prohibited. Requires BMPs, developing and implementing a Stormwater Pollution Prevention Plan, and monitoring stormwater discharges. Contains numeric effluent limits and action levels.	Construction site that disturbs one or more acres of soil	SWRCB Order Number 2009-009-DWQ, as amended by 2010-0014-DWQ and 2012-0006-DWQ (General Construction Activity Stormwater Permit)			3	Pursuant to CERCLA § 121(e), onsite response actions are exempt from the requirement to obtain a permit. Therefore, the Navy is not required to obtain a State of California General Construction Stormwater Permit for construction activity affecting at least 1 acre. Although not an ARAR, the Navy would implement the substantive provisions of this permit in Alternative 3 to comply with the federal CWA ARARs. The Navy would implement BMPs and prepare a CERCLA stormwater plan that will include monitoring, sampling and analysis, and numeric action levels as required under the state general stormwater permit in Alternative 3.

Table A-5. Potential State Action-specific Applicable or Relevant and Appropriate Requirements

Removal Action Alternatives: 1 – No Action; 2 – ICs; 3 – Excavation and Offsite Disposal							
Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination ^a			Comments
				A	RA	TBC	
California Department of Toxic Substances Control ^b							
Place ICs	Whenever the Department determines that it is not feasible to record a land use covenant for property owned by the federal government, such as transfers from one federal agency to another, the Department and federal government shall use other mechanisms to ensure that future land use will be compatible with the levels of hazardous materials, hazardous wastes or constituents, or hazardous substances that remain on the property. Examples include amendments to the federal government Facility Master Plan, physical monuments, or agreements between the federal government facility and the Department.	Hazardous substances remaining at levels unacceptable for unrestricted use on property held by the federal government.	Cal. Code Regs. tit. 22, § 67391.1(e)(2)		2		The substantive provisions of Cal. Code Regs. tit. 22, § 67391.1(e)(2) are potential ARARs for MRP Site 2 insofar as Alternative 2 requires imposition of ICs as a function of the CERCLA process. Accordingly, to help ensure that future land uses at MRP Site 2 will be compatible with the levels of any hazardous substances that may remain at the site after implementation of a CERCLA response action, pertinent information concerning any ICs will be contained in the Facility Master Plan.

^a The numbers in the A (applicable), RA (relevant and appropriate), or TBC (to be considered) columns correspond to the alternatives for which the requirement is a potential ARAR.

^b Statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the Navy accepts the entire statutes or policies as potential ARARs. Specific potential ARARs follow each general heading, and only substantive requirements of the specific citations are considered potential ARARs.

Attachment A1

Navy Request for State ARARs

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DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND SOUTHWEST
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132-5190

5090
Ser EV35.AT/239
January 6, 2020

Mr. Isaac Hirbawi,
Project Manager, HSE
Brownfields and Environmental Restoration Program
California Department of Toxic Substances Control
5796 Corporate Ave
Cypress, CA 90630

Mr. Jose Cortez
Water Resources Control Engineer
Colorado River Basin Regional Water Quality Control Board
73-720 Fred Waring Drive, Suite 100 Palm Desert, CA 92260

Re: IDENTIFICATION OF STATE APPLICABLE OR RELEVANT AND APPROPRIATE
REQUIREMENTS (ARARs) FOR THE NON-TIME CRITICAL REMOVAL ACTION
AT MUNITIONS RESPONSE PROGRAM (MRP) SITE 2 AT NAVAL AIR FACILITY
EL CENTRO

Dear Mr. Hirbawi and Mr. Cortez:

Navy policy requires removal actions to comply with ARARs to the extent practicable. Pursuant to our previous discussions and Navy policy, we are hereby requesting that the Department of Toxic Substances Control (DTSC) as the lead agency for the State of California, and the Colorado River Basin Regional Water Quality Control Board identify potential State ARARs for MRP Site 2. ARARs identified by the State will be considered and evaluated during the preparation of an Engineering Evaluation/Cost Assessment (EE/CA) for the proposed non-time critical removal action at the site.

In the Final Remedial Investigation, dated September 2019, we transmitted to you site characterization data for MRP Site 2. The site characterization data should allow you to begin to identify, with some specificity, State chemical-specific and location-specific ARARs.

The following information is being provided to aid the State in its identification of potential action-specific State ARARs. The following alternatives are proposed for MRP Site 2:

- Alternative 1 – No action
- Alternative 2 – Alternative 2 – Institutional Controls, which consists of preventing residential land use in the area of lead-impacted soil
- Alternative 3 – Excavation and Offsite Disposal, which consists of excavating lead-contaminated soil to approximately 1 foot below ground surface and disposing of the soil offsite and removal and recycling of surface debris

5090
Ser EV35.AS/239
January 6, 2020

Re: IDENTIFICATION OF STATE APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs) FOR THE NON-TIME CRITICAL REMOVAL ACTION AT MUNITIONS RESPONSE PROGRAM (MRP) SITE 4 AT NAVAL AIR FACILITY EL CENTRO

The State of California may also identify any other criteria, advisories, guidance, and proposed standards that the State requests be considered (TBCs) for the above-identified site that will be addressed by this removal action.

Timely identification of potential State ARARs is crucial to the success of the proposed removal action. Experience to date around the country has shown that a failure to identify ARARs with sufficient precision, early in the removal action selection process, can cause severe disruptions in timely implementation of the removal action. To ensure timely and complete ARARs identification please include the following information:

1. A specific citation to the statutory or regulatory provision(s) for the potential State ARAR and the date of enactment or promulgation.
2. A brief description of why the potential State ARAR is applicable or relevant and appropriate to MRP Site 2.
3. A description of how the potential State ARAR would apply to potential removal action, including: specific numeric discharge, effluent, or emission limitations; hazardous substance/constituent action or cleanup levels if the State intends to take the position that the potential State ARAR includes such limitations or levels.
4. If the State believes its proposed ARAR is more stringent than the corresponding Federal ARAR, please provide the rationale and technical justification for this position.
5. If the State determines that there is not enough information to fully respond to our request, please identify any additional information that would be required to support identification of State ARARs.

5090
Ser EV35.AS/239
January 6, 2020

Re: IDENTIFICATION OF STATE APPLICABLE OR RELEVANT AND APPROPRIATE
REQUIREMENTS (ARARs) FOR THE FEASIBILITY STUDY (FS) AT MUNITIONS
RESPONSE PROGRAM (MRP) SITE 4 AT NAVAL AIR FACILITY EL CENTRO

We are requesting that you send a response via first class mail addressed to me and
postmarked within 30 calendar days of receipt of this request. Please direct any technical
questions that you may have concerning this request to me at (619) 532-4052 and any legal
questions to Michael Waters, Associate Counsel, at (619) 532-2312.

Sincerely,



SI T. LE
By Direction

Copy to:
Mr. Carlos Lau, Project Manager, CH2M HILL

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Attachment A2

State ARARs Responses

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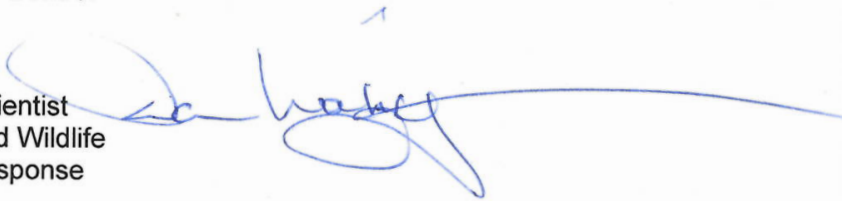
State of California
Department of Fish and Wildlife

M e m o r a n d u m

Date: February 18, 2020

To: Irena Edwards, Project Manager
Site Mitigation and Restoration Program
Department of Toxic Substances Control
5796 Corporate Avenue
Cypress, CA 90630

From: Dan Waligora, Environmental Scientist
California Department of Fish and Wildlife
Office of Spill Prevention and Response
Resource Restoration Program
Base Realignment and Closure (BRAC) Unit
1010 Riverside Parkway
West Sacramento, CA 95605



Subject: Identification of State Applicable or Relevant and Appropriate Requirements (ARARs) for the Non-Time Critical Removal Action at Munitions Response Program (MRP) Site 2 at Naval Air Facility El Centro

This memorandum is in response to the Navy's request for potential State Applicable or Relevant and Appropriate Requirement (ARARs) for Munitions Response Program (MRP) Site 2, forwarded by the Department of Toxic Substances Control (DTSC) to California Department of Fish and Wildlife, Office of Spill Prevention and Response (CDFW-OSPR) on January 23, 2020. We understand that the ARARs will be considered and evaluated during the preparation of the Engineering Evaluation/Cost Assessment (EE/CA) for the proposed non-time critical removal action (NTCRA) at the site. The CDFW-OSPR appreciates the opportunity to provide ARARs for the protection of State natural resources. The CDFW is the State's Trustee for fish and wildlife resources pursuant to Fish and Game Code Section 711.7. The CDFW is also designated as a Trustee for natural resources pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act Section 107 (f)(2)(B). The enclosed ARARs are for the protection of State fish, wildlife, and plant species and their habitat at MRP Site 2. Page 1 of the three page request for ARARs for MRS Site 2, indicates the requested ARARs are for MRS Site 2 while pages 2 and 3 of the ARARs request indicates the ARARs are for MRS Site 4. The attached ARARs are site specific and specific to MRS Site 2, though many and possibly all may also be applicable to MRS Site 4, depending on contaminants and habitat(s) present at MRS Site 4.

Irena Edwards, Project Manager
February 18, 2020
Page 2 of 4

CDFW-OSPR acknowledges that development of ARARs is an iterative process and that ARARs may be further evaluated and refined as more information becomes known about proposed remedies. Should additional information substantiate the need to propose additional ARARs, such revisions may take place until the Record of Decision (ROD) is finalized and the final list of ARARs and To Be Considered (TBCs) requirements are adopted in the Record of Decision.

Background

Naval Air Facility El Centro (NAFEC) is an active 2,289-acre installation located in the Imperial Valley of southeastern California, south of the Salton Sea and approximately 11 miles north of the United States/Mexico border. The installation is located in Imperial County approximately seven miles northwest of the City of El Centro and 85 miles east of San Diego, in the Colorado Desert. As noted below, the principal focus of NAFEC is to provide air combat training. NAFEC serves as a support facility for active or reserve units from each of the major Department of Defense components (U.S. Navy, U.S. Marine Corps, U.S. Army, and U.S. Air Force), as well as units from the National Guard, Coast Guard, and international (allied/foreign) aviation units. NAFEC has no aircraft squadrons permanently assigned to the facility.

NAFEC was first commissioned in 1942 as a Marine Corps Air Station (MCAS). In 1946 the base was commissioned as a Naval Air Station and has had several different missions with the Navy over the years. Major operations at the base included aeronautical testing with photographic documentation, aircraft repair, and various training and range activities. The installation was reported at one time to be the home of the second largest photo laboratory in California, operating 24 hours a day with 60 employees. Currently, the installation provides training for active and reserve aviation units, as well as for ground forces to practice gunnery, bombing, carrier landings, and air combat. In the past, small arms training took place at several former small arms ranges including MRP Site 2.

MRP Site 2 is a 4-acre site located approximately 1 mile north of the NAFEC runways, north and east of Patrol Road, adjacent to the northern installation boundary. The former Small Arms Range (MRP Site 2) was constructed in 1942 with 10 fixed firing positions and targets located at 10, 20, and 45 yards. The range was used for small arms training and periodic re-qualification through the 1980s. Weapons use was limited to small arms, primarily small caliber (.22, .38, and .45-caliber, and 9-millimeter) handguns. The backstop berm was approximately 15 feet high and 75 feet long. The backstop berm has been demolished and soil from the berm is stockpiled onsite. The site is no longer in use and desert scrub vegetation has re-established at localized areas of the former range. Concrete and metal debris from a former structure (Building 162) remain on site.

Irena Edwards, Project Manager
February 18, 2020
Page 3 of 4

MRP Site 2 lies within approximately one mile of the New River and jurisdictional wetlands delineated along the tributary to the New River (Tierra Data Inc. 2014) which provide potential habitat for native and special status species. Native vegetation has been planted in several areas of the installation and has reestablished itself in areas that receive little to no use, such as the former ranges located north of the airfield, including MRP 2. Native wildlife may find these areas suitable as habitat. Common wildlife species found near NAFEC include the gopher snake, side-blotched lizard, western whiptail, mourning dove, Western Meadowlark, Red-winged Blackbird, American Coot, Ring-billed Gull, American Kestrel, Cattle Egret, Great Blue Heron, deer mouse, desert cottontail, round-tailed ground squirrel, and coyote (Tierra Data Inc. 2014). Special-status wildlife that have the potential to occur at NAFEC are the flat-tailed horned lizard (*Phrynosoma mcallii*) and the Burrowing Owl (*Athene cunicularia*) (Tierra Data, 2014). As of the 2014 Integrated Natural Resources Monitoring Plan (INRMP) for NAFEC, a complete inventory of vegetation communities had not been conducted. Other special status species with the potential to be present at NAFEC include Peirson's milk vetch (*Astragalus magdalenae* var. *peirsonii*) and Wiggins' croton (*Croton wigginsii*), federally listed as threatened and state rare plant species, respectively; Tri-colored Blackbird (state threatened species); Willow Flycatcher (state endangered); California Black Rail (state threatened and state Fully Protected Species); and Yuma Ridgway's Rail (formerly Yuma clapper rail) (state endangered and state Fully Protected Species). Additional state Fully Protected Species which may be present include American Peregrine Falcon, Southern Bald Eagle, White-tailed Kite, and ring-tailed cat. Other than collection for scientific research purposes for the recovery of the species, Fully Protected Species may not be "taken" or possessed at any time and CDFW is not authorized to issue a permit for their "take", including trapping.

If you have any questions regarding these ARARs or require further details, please contact Dan Waligora at (916) 375-4904, or by e-mail at Dan.Waligora@wildlife.ca.gov.

Reviewers: Tami LaBonty, Senior Environmental Scientist (Specialist)
Nicole R. Gleason, Senior Attorney

Attachments: 1 (California Department of Fish and Wildlife Location and Action Specific ARARs and TBCs for MRP Site 2, Naval Air Facility El Centro)

References:

Tierra Data Inc. 2014, Integrated Natural Resources Management Plan, Naval Air Facility El Centro, El Centro, California. September.

Irena Edwards, Project Manager
February 18, 2020
Page 4 of 4

cc: Brian Faulkner, Ph.D., Senior Toxicologist (sent via email to:
Brian.Faulkner@dtsc.ca.gov)
Department of Toxic Substances Control
Human and Ecological Risk Office
Ecological Risk Assessment Section
8800 Cal Center Drive
Sacramento, CA 95826

Mary Beth Woulfe (via e-mail to: MaryBeth_Woulfe@fws.gov)
U.S. Fish and Wildlife Service
Carlsbad Field Office
6010 Hidden Valley Road
Carlsbad, CA 92011

Rich Burg, Senior Biologist (via e-mail to: Richard.Burg@wildlife.ca.gov)
California Department of Fish and Wildlife
South Coast Region
4949 Viewridge Avenue
San Diego, CA 92123

Page 1 of 8

ATTACHMENT 1 OF 1
CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE
LOCATION AND ACTION SPECIFIC ARARs AND TBCs
FOR
MUNITIONS RESPONSE PROGRAM SITE 2
NAVAL AIR FACILITY EL CENTRO
February, 2020

LOCATION	STANDARD	SPECIFIC CITATION	ARAR/TBC EXPLANATION
Aquatic species and habitat	Action must be taken to prevent deleterious materials from entering state waters.	Fish and Game Code section 5650 (a)	<p>This code section prohibits depositing or placing where it can pass into waters of the state any petroleum products (Section 5650(a)(1)), factory refuse (section 5650(a)(4)), sawdust, shavings, slabs or edgings (section 5650(a)(3)), or any substance deleterious to fish*, mammals, plant life or bird life (section 5650(a)(6)). These are substantive, promulgated environmental protection requirements. These requirements impose strict criminal liability on violators. (<i>People v. Chevron Chemical Company (1983) 143 Cal. App. 3d 50</i>). This imposition of strict criminal liability imposes a standard that is more stringent than federal law.</p> <p>Section of 5650 is relevant and appropriate because MRP Site 2 (Small Arms Range) lies within approximately one mile of the New River and jurisdictional wetlands delineated along the tributary to the New River (Tierra Data Inc. 2014). Any activities by the Navy which may cause contaminants to pass directly, or via irrigation canals, into waters of the State would trigger the provisions of this section.</p> <p>* "Fish" means a wild fish, mollusk, crustacean, invertebrate, amphibian, or part, spawn, or ovum of any of those animals.</p>
Wildlife Species	Action required to avoid takeof birds and mammals by poison or other methods referenced in the Code	Fish and Game Code section 3005 (Stats. 1957, c. 456, p. 1353 section 3005)	<p>This code section prohibits the taking of birds and mammals by poison. "Take" is defined by Fish and Game Code section 86 to include killing. "Poison" is not defined in the code. Federal law recognizes that poison, such as Strychnine, may effect incidental taking. (<i>Defenders of Wildlife v. Administrator, Environmental Protection Agency (1989) 882 F. 2d 1295</i>). This code section imposes a substantive, promulgated environmental protection requirement that is more stringent than federal law. It is relevant and appropriate to locations in the state where birds and mammals encounter poisonous materials, including hazardous substances that are the subject of a CERCLA action.</p> <p>Munitions Constituents (MCs) (metals [antimony, arsenic, copper, lead, and zinc] and PAH compounds) are present at NAFEC and could be exposed to receptors and result in take of wildlife found at and around MRP Site 2. Therefore, this code section is relevant and appropriate to the remedial actions at the site.</p>

Page 2 of 8

ATTACHMENT 1 OF 1
CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE
LOCATION AND ACTION SPECIFIC ARARs AND TBCs
FOR
MUNITIONS RESPONSE PROGRAM SITE 2
NAVAL AIR FACILITY EL CENTRO
February, 2020

LOCATION	STANDARD	SPECIFIC CITATION	ARAR/TBC EXPLANATION
Rare native plants	Action must be taken to conserve native plants.	Fish and Game Code section 1908 (Added by Stats. 1977, c. 1181, p. 3869, section 8)	<p>Section 1908 imposes a substantive requirement by prohibiting any "person" from taking rare or endangered native plants. California Code of Regulations Title 14 section 670.2 provides a listing of Threatened, Endangered, or Rare plants in California. Fish and Game Code section 67 provides the definition of "person" as any natural person or any partnership, corporation, limited liability company, trust, or other type of association. All locations within the state where rare or endangered plants are present are subject to the requirements of Section 1908.</p> <p>Rare or endangered plant species that are known to be present in the vicinity of MRP Site 2 include Peirson's milk vetch (<i>Astragalus magdalenae</i> var. <i>peirsonii</i>) and Wiggins' croton (<i>Croton wigginsii</i>). However, per the 2014 INRMP, a complete inventory of vegetation communities has not been conducted.</p>
Endangered Species	Action must be taken to avoid take of threatened or endangered species.	Fish and Game Code section 2080 (Added by Stats. 1984, c. 1240, section 2).	<p>This section prohibits the take, possession, purchase or sale within the state, any species (including rare native plant species), or any product thereof, that the commission determines to be an endangered or threatened species, or the attempt of any of these acts. All locations within the state that contain endangered and/or threatened species are subject to the requirements of Section 2080.</p> <p>Per the INRMP (Tierra Data Inc. 2014), which states that "<i>a comprehensive survey of birds [at NAFEC] would expect to yield similar sightings to those recorded throughout the Imperial Valley and [Salton Sea] Refuge</i>", which have documented the following threatened or endangered species that may be present at MRP Site 2: Tri-colored Blackbird, Willow Flycatcher, California Black Rail, and Yuma Ridgway's Rail (formerly Yuma Clapper Rail) (https://www.fws.gov/saltonsea/pdf/Birdlist%20webpage113009.pdf).</p>

Page 3 of 8

ATTACHMENT 1 OF 1
CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE
LOCATION AND ACTION SPECIFIC ARARs AND TBCs
FOR
MUNITIONS RESPONSE PROGRAM SITE 2
NAVAL AIR FACILITY EL CENTRO
February, 2020

LOCATION	STANDARD	SPECIFIC CITATION	ARAR/TBC EXPLANATION
Fully protected bird species/habitat	No fully protected birds may be taken or possessed at any time.	Fish and Game Code section 3511 (Added by Stats.1970, c. 1036, p. 1848 section 4)	<p>This section provides that it is unlawful to take or possess any of the following fully protected birds:</p> <ul style="list-style-type: none"> (a). American peregrine falcon (b). Brown pelican (c). California black rail (d). California clapper rail (e). California condor (f). California least tern (g). Golden eagle (h). Greater sandhill crane (i). Light-footed clapper rail (j). Southern bald eagle (k). Trumpeter swan (l). White-tailed kite (m). Yuma clapper rail <p>Any location within the state where fully protected birds and/or their habitat are located is subject to the requirements of Section 3511. Furthermore, section 3511 states "a fully protected bird may not be taken or possessed at any time" and "no provision of this code or any other law shall be construed to authorize the issuance of a permit or license to take a fully protected bird," although take may be authorized for necessary scientific research. This language arguably makes the "Fully Protected" designation the strongest and most restrictive regarding the "take" of species in California.</p> <p>Per the INRMP(Tierra Data Inc. 2014) "a comprehensive survey of birds [at NAFEC] would expect to yield similar sightings to those recorded throughout the Imperial Valley and [Salton Sea] Refuge". Birdlists for the Salton Sea (USFWS, CDFW), identify the following fully protected species that may be present at MRP Site 2: American Peregrine Falcon, California Black Rail, Southern Bald Eagle, White-tailed Kite, and Yuma Clapper Rail (www.fws.gov/saltonsea/pdf/Birdlist%20webpage113009.pdf). American Peregrine Falcon, California Black Rail, Southern Bald Eagle, White-tailed Kite, and Yuma Clapper Rail and/or their habitat are potentially located on the site.</p>

Page 4 of 8

ATTACHMENT 1 OF 1
CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE
LOCATION AND ACTION SPECIFIC ARARs AND TBCs
FOR
MUNITIONS RESPONSE PROGRAM SITE 2
NAVAL AIR FACILITY EL CENTRO
February, 2020

LOCATION	STANDARD	SPECIFIC CITATION	ARAR/TBC EXPLANATION
Birds	Action must be taken to avoid the take or destruction of the nest or eggs of any bird.	Fish and Game Code section 3503	<p>This section generally prohibits the take, possession, or needless destruction of the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. This code section imposes a substantive, promulgated environmental protection requirement that is more stringent than federal law. Any locations within the state where birds of any kind have nests or eggs are subject to Section 3503.</p> <p>Per the INRMP, numerous species of birds are potentially at the site that could be impacted if work at MRP Site 2 is conducted during nesting season (February 1 - September 15).</p>
	Action must be taken to prevent the take, possession, or destruction of any birds-of prey or their eggs.	Fish and Game Code section 3503.5 (Added by Stats. 1985, c. 1334, section 6)	<p>This section prohibits the take, possession, or destruction of any birds in the orders of Falconiformes or Strigiformes (birds-of-prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto. This code section imposes a substantive, promulgated environmental protection requirement that is more stringent than federal law. This section is relevant and appropriate to the extent that such species and/or their nests and eggs are located on or near the site.</p> <p>Numerous birds-of-prey such as Burrowing Owl, Prairie Falcon, and American Peregrine Falcon have been known to nest at or near NAFEC per the INRMP and birdlists for the Salton Sea (USFWS, CDFW), therefore this section is relevant and appropriate.</p>

Page 5 of 8

ATTACHMENT 1 OF 1
CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE
LOCATION AND ACTION SPECIFIC ARARs AND TBCs
FOR
MUNITIONS RESPONSE PROGRAM SITE 2
NAVAL AIR FACILITY EL CENTRO
February, 2020

LOCATION	STANDARD	SPECIFIC CITATION	ARAR/TBC EXPLANATION
Migratory Birds	Action must be taken to prevent the take or possession of any migratory nongame birds.	Fish and Game Code section 3513	<p>This section makes it unlawful to take or possess any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame bird except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the Migratory Bird Treaty Act prior to January 1, 2017 or after January 20, 2025. This state law is a more stringent than the MBTA and rejects the position taken in the U.S Department of Interior Solicitor's memorandum dated December 22, 2017, titled The Migratory Bird Treaty Act Does Not Prohibit Incidental Take ("M-37050"). This section is relevant and appropriate to the extent that migratory nongame birds and their habitat are potentially located on or near the site.</p> <p>NAFEC lies within the Pacific Flyway, a major north-south flyway for migratory birds extending from Alaska to Patagonia; therefore this section is relevant and appropriate.</p>
Furbearing Mammals	Action must be taken to avoid take.	Title 14 C.C.R. section 460 (effective 07/01/59)	<p>Regulation makes it unlawful to take Fisher, marten, river otter, desert kit fox, and red fox. This code section imposes a substantive, promulgated environmental protection requirement that is more stringent than federal law. At any location in the state where these species and/or their habitat are located, Section 460 requires action to be taken to avoid take.</p> <p>NAFEC is located within the range of the desert kit fox and therefore this section is a relevant and appropriate requirement.</p>

Page 6 of 8

ATTACHMENT 1 OF 1
CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE
LOCATION AND ACTION SPECIFIC ARARs AND TBCs
FOR
MUNITIONS RESPONSE PROGRAM SITE 2
NAVAL AIR FACILITY EL CENTRO
February, 2020

LOCATION	STANDARD	SPECIFIC CITATION	ARAR/TBC EXPLANATION
Wetlands	Action must be taken to protect, preserve, and restore wetland acreage or habitat value.	Fish and Game Commission Wetlands Policy (adopted 1987) included in Fish and Game Code Addenda	<p>TBC: This policy seeks to provide for the protection, preservation, restoration, enhancement and expansion of wetland habitat in California. Further, it strongly discourages any development or conversion of wetlands. It adopts the USFWS definition of a wetland which utilizes hydric soils, saturation or inundation, and vegetation criteria, and requires the presence of at least one of these criteria (rather than all three) in order to classify an area as a wetland.</p> <p>All locations within the state that include wetlands are subject to the Fish and Game Commission Wetlands Policy and therefore the requirements of the policy including protecting, preserving and restoring wetlands, should be considered.</p>

Page 7 of 8

ATTACHMENT 1 OF 1
CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE
LOCATION AND ACTION SPECIFIC ARARs AND TBCs
FOR
MUNITIONS RESPONSE PROGRAM SITE 2
NAVAL AIR FACILITY EL CENTRO
February, 2020

LOCATION	STANDARD	SPECIFIC CITATION	ARAR/TBC EXPLANATION
Species of Special Concern ("SSC") habitat	The intention in designating SSCs is to achieve conservation and recovery of Species of Special Concern before they meet California's Endangered Species Act criteria for listing as threatened or endangered; focus attention on animals at conservation risk by the Department, other State, local and Federal governmental entities, regulators, land managers, planners, consulting biologists and others; and stimulate research on poorly known species.	14 CCR § 3703(a); 14 CCR § 15380(d); 14 CCR § 15063; 14 CCR § 15065 and California Department of Fish and Wildlife California Natural Diversity Database (CNDDDB)'s Special Animals List: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109406&inline	<p>TBC: This regulation and the Special Animals List require conservation of Species of Special Concern (SSC) as well as mitigation measures if avoidance cannot be achieved through available alternatives.</p> <p>A SSC is a species, subspecies, or distinct population of an animal* native to California that currently satisfies one or more of the following (not necessarily mutually exclusive) criteria**:</p> <ul style="list-style-type: none"> • is extirpated from the State or, in the case of birds, is extirpated in its primary season or breeding role; • is listed as Federally-, but not State-, threatened or endangered; meets the State definition of threatened or endangered but has not formally been listed; • is experiencing, or formerly experienced, serious (noncyclical) population declines or range retractions (not reversed) that, if continued or resumed, could qualify it for State threatened or endangered status; • has naturally small populations exhibiting high susceptibility to risk from any factor(s), that if realized, could lead to declines that would qualify it for State threatened or endangered status. <p>*for the purposes of this discussion, "animal" means fish, amphibian, reptile, bird and mammal</p> <p>**criteria for fish are similar except that Federally listed taxa are not defined as SSCs.</p> <p>All locations within the state where SSCs are present are subject to the SSC regulations and therefore efforts to achieve conservation and recovery of SSCs at the site should be considered.</p>

Page 8 of 8

**ATTACHMENT 1 OF 1
CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE
LOCATION AND ACTION SPECIFIC ARARs AND TBCs
FOR
MUNITIONS RESPONSE PROGRAM SITE 2
NAVAL AIR FACILITY EL CENTRO
February, 2020**

References

California Department of Fish and Wildlife (CDFW): <https://wildlife.ca.gov/Regions/6/Salton-Sea-Birds/Salton-Sea-Bird-Species>.

Tierra Data Inc. 2014, Integrated Natural Resources Management Plan, Naval Air Facility El Centro, El Centro, California.
September.

United States Fish and Wildlife Service (USFW): www.fws.gov/saltonsea/pdf/Birdlist%20webpage113009.pdf.



Jared Blumenfeld
Secretary for
Environmental Protection



Department of Toxic Substances Control

Meredith Williams, Ph.D.
Director
5796 Corporate Avenue
Cypress, California 90630



Gavin Newsom
Governor

February 20, 2020

Ms. Amy Tong
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REQUEST FOR IDENTIFICATION OF STATE APPLICABLE OR RELEVANT AND
APPROPRIATE REQUIREMENTS FOR MUNITION RESPONSE PROGRAM SITES 2
AND 4 NAVAL AIR FACILITY, EL CENTRO, CALIFORNIA
(SITE CODE: 400054)

Dear Ms. Tong:

The Department of Toxic Substances Control (DTSC) received the Department of Navy (Navy) letters, dated January 6, 2020 and November 2019, requesting that DTSC identify Applicable or Relevant and Appropriate Requirements (ARARs) for the upcoming implementation of the non-time critical removal action at the Munition Response Program (MRP) Site 2-Small Arms Range and feasibility study at MRP Site 4-Torrent and Skeet Range at the Naval Air Facility El Centro (NAFEC), California.

MRP Site 2, former Small Arms Range is a 4-acre site located approximately 1 mile north of the NAFEC runways, north and east of Patrol Road, adjacent to the northern installation boundary. MRP Site 2 was used for small arms training from approximately 1942 to 1989. Weapons use was limited to small handguns. The backstop berm was approximately 15 feet high and 75 feet long. The backstop berm has been demolished and soil from the berm is stockpiled on-site. Concrete and metal debris from a former structure (Building 162) were observed on the site during the Preliminary Assessment (PA) (Malcolm Pirnie, 2005). The MRP Site 2 is currently not in use. The non-time critical removal of lead-impacted soil at MRP Site 2 may include institutional controls, shallow soil excavation and off-site disposal, and removal and recycling of surface debris.

Ms. Amy Tong
February 20, 2020
Page 2 of 3

MRP Site 4 consists of approximately 48 acres and encompasses the Turret and Skeet Range and associated features. The former Turret and Skeet Range consists of approximately 10 acres, located north of the runways, north of Big Red Boulevard, near the northern installation boundary. Turret and Skeet Range was in operation between approximately 1943 to 1952. During the 1940s, the Bombardier and Air Gunnery School used the ranges for small arms training, including machine gun familiarization, shotgun proficiency, and moving target orientation. The Skeet Range was a single field shotgun range, with skeet shooting to the north of the firing arc. Munitions use was limited to small arms ammunition, primarily 30 and 50 caliber machine gun ammunition and 12, 16, and 20-gauge and 410-caliber shotgun ammunition. The demolition and removal of the range structures occurred prior to 1977. Since the demolition of the range, the site was used for agriculture until 2017. MRP Site 4 currently houses buildings (magazines) for storage, assembly, and loading of ordinance. The feasibility study will compare institutional controls, shallow soil excavation and off-site disposal, engineered cap construction, and or soil stabilization with lime and cement and select the best alternative to address lead and polycyclic aromatic hydrocarbons (PAHs) impacted soil at MRP Site 4. Attached to this letter please find the following:

- 1- California Department of Fish and Wildlife ARARs, dated February 18, 2020
- 2- DTSC Potential ARARs for Hazardous Waste Management: The following sections represent the ARARs which are applicable to the MRP Sites 2 and 4 soil non-time critical removal:
 - a. Sections 1 through 11, 13, 14, 17;
 - b. Sections 22, 23, 24, 25, 26, 27, 28, 29, 30, 31;
 - c. Sections 34, 35, 36, 37, 38, 39;
 - d. Section 56, 58, 61, 62, 63, 64, 67, 70;
 - e. Sections 75, 76, 77, 78, 79;
 - f. Sections 81, 82, 83, 85, 86, 87, 88, 89, 90, 91; and,
 - g. Sections 127, 128, 129, 130, 131, 132, 134, and 135.

The Colorado Basin Regional Water Quality Control Board will submit their ARARs directly to the Navy.

If you have any questions, you may contact me at (714) 484-5385 or e-mail irena.edwards@dtsc.ca.gov or you may contact my Supervisor, Ms. Maryam Tasnif-Abbasi at maryam.tasnif-abbasi@dtsc.ca.gov.

Sincerely,



Irena Edwards
Environmental Scientist
Site Mitigation and Restoration Program

Ms. Amy Tong
February 20, 2020
Page 3 of 3

Peer Reviewed by: Mustapha Guerbaz
Hazardous Substances Engineer

Enclosure: DTSC Potential ARARs
California Department of Fish and Wildlife ARARs

cc: Ms. Maryam Tasnif-Abbasi
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DTSC – Potential ARARs for Hazardous Waste Management State of California

This Table sets forth state potential applicable or relevant and appropriate requirements (ARARs) and potential “to-be-considered” (TBCs) guidance that address remediation of hazardous waste. These potential ARARs and TBCs are typically implemented by the California Department of Toxic Substances Control (DTSC). The Table includes the statutory source of the potential ARARs, the citation to the potential ARAR or TBC, the status of the potential ARAR, a description of the potential ARAR or TBC, and comments to assist in implementing the potential ARAR or TBC.

The State and the Air Force have developed similar tables for six groups of State provisions: DTSC (hazardous waste management), Water Boards (groundwater remediation, soil/sediment remediation), Water Boards / CalRecycle (non-hazardous and hazardous waste land disposal), Department of Fish and Wildlife (fish, wildlife, plants), Air Quality and Department of Public Health (radiological material). Users should refer to all six tables, as appropriate for the specific site.

In order for a State standard to be considered as an ARAR for a particular site, the State must identify the provision to the Air Force as a potential ARAR for the specific site in a timely manner. The provision will then be evaluated on a site specific basis. The purpose of the Air Force and State comments in the chart below is to describe the likely perspective of the Air Force and State resulting from those site-specific reviews for future reference by Air Force and State staff. This chart should not be considered to be an Air Force or State commitment to any particular ARAR determination for any particular site.

This table does not reflect the perspective of federal agencies other than the Air Force. ARARs are determined on a site-specific basis. The characteristics of a particular site, and the views of other federal agencies, may lead to different conclusions about whether a particular provision is a potential ARAR for a site.

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
Chapter 11 Articles 1, 3, and 5							
1	Definition of and Criteria for Identifying Hazardous Wastes	Ch. 11 Article 1, §§66261.2-3;; Article 3 §§66261.21, 23-24; Article 5 §§66261.100-.101, .107, .110, .111, .113, .122	Defines wastes that are subject to regulation as a RCRA or California hazardous waste. Defines criteria for designating a waste an extremely hazardous waste. Requires reporting of hazardous waste of concern in the event it is discovered to be missing. A solid waste is considered a hazardous waste if it exhibits any of the characteristics of ignitability, corrosivity, reactivity, or toxicity, if it is listed as a hazardous	Applicable if wastes are hazardous as defined by 22 CCR	The Toxicity Characteristic Leaching Procedure (TCLP) limits should be used to verify whether excavated soil is hazardous. See Table A-2 for Toxicity Characteristic Leaching Procedure (TCLP) limits for COCs. The definitions of hazardous waste in Article 1 and toxicity characteristic criteria (i.e., TTLC and STLC levels) in	Joint comments: Potential ARAR for identifying and classifying excavated soil deposited in an area outside of a CAMU, treatment unit, or staging pile and remediation waste (such as soil cuttings from well installation and purge water and spent carbon from groundwater monitoring and onsite water treatment) .	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
			waste. Wastes can be classified as non-RCRA, State-only hazardous wastes if they exceed the Soluble Threshold Limit Concentration (STLC) or Total Threshold Limit Concentration (TTL) values. California hazardous wastes previously released into the environment are considered hazardous substances under California law. New California hazardous wastes generated in the course of the response action must be properly managed as hazardous wastes, including manifesting, storage, treatment and/or disposal.		Section 66261.24 are potentially applicable for the characterization of soil cuttings from well installation, purge water from groundwater monitoring, or hazardous wastes excavated during refuse cell consolidation.	<p>Disposal requirements apply off-site thus are not ARARs. They must be independently complied with as applicable.</p> <p>AF comments: Contaminated soils or groundwater that are treated in situ are not subject to the identification or classification requirements.</p> <p>Reporting provisions (such as 22 CCR 66261.111(c)) are procedural and thus not ARARs. Reporting is generally taken care of in the CERCLA process.</p> <p>State comments: In situ material needs to be identified and classified as hazardous waste or nonhazardous waste according to these regulations.</p>	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
Chapter 11 Article 4							
2		Ch. 11 Article 4 §66261.30 Lists of RCRA Hazardous Wastes - General	A waste is a RCRA hazardous waste if it is listed in this article, unless it has been excluded from this list pursuant to 40 CFR sections 260.20 and 260.22 or is categorized as a non-RCRA hazardous waste pursuant to section 66261.101.	Applicable if wastes are hazardous as defined by 22 CCR		Joint comments: See comments in row 1 above.	
3		Ch. 11 Article 4 §66261.31. Lists of RCRA Hazardous Wastes - Hazardous Wastes from Non-Specific Sources.	listed hazardous wastes from non-specific sources unless they are excluded pursuant to 40 CFR sections 260.20 and 260.22	Applicable if wastes are hazardous as defined by 22 CCR		Joint comments: See comments in row 1 above.	
4		Ch. 11 Article 4 §66261.32. Lists of RCRA Hazardous Wastes - Hazardous Wastes from Specific Sources.	listed hazardous wastes from specific sources unless they are excluded pursuant to 40 CFR sections 260.20 and 260.22	Applicable if wastes are hazardous as defined by 22 CCR		Joint comments: See comments in row 1 above.	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
5		Ch. 11 Article 4 §66261.33. Lists of RCRA Hazardous Wastes - Discarded Commercial Chemical Products, Off-Specification Species, Container Residues, and Spill Residues Thereof.		Applicable if wastes are hazardous as defined by 22 CCR		Joint comments: See comments in row 1 above.	
Chapter 12 Articles 1-4							
6	Standards Applicable to Generators of Hazardous Waste	Ch. 12, Articles 1-4, §§66262.10-.47	Establishes standards for generators of RCRA and California hazardous wastes, including those for hazardous waste determination, accumulation, identification numbers, manifesting, pre-transport, and record-keeping and reporting requirements. Accumulation of hazardous wastes onsite for longer than 90 days would be subject to RCRA requirements for storage facilities.	Applicable if wastes are hazardous as defined by 22 CCR	Substantive requirements are potentially ARARs if excavated soils or treatment residuals exceed RCRA or California hazardous waste thresholds. Hazardous remediation waste may be stored onsite in Temporary Units. These Temporary Units are not subject to the less than 90-day accumulation time requirement. Temporary Units may operate for 1 year with an opportunity for a 1-year extension.	Joint comments: Substantive requirements are potential ARARs if excavated soil placed for disposal in an area outside of a treatment unit or staging pile or remediation waste is hazardous waste. AF comments: Not a potential ARAR for excavated soil placed for disposal in a CAMU. Administrative requirements, including documentation, reporting and record keeping are not	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						ARARs. State comments: These provisions are also a potential ARAR for excavated soil placed for disposal in a CAMU.	
Chapter 12 Article 3							
7	Hazardous Waste Transportation	Ch. 12 Article 3 §§66262.30- .33	Prior to transportation, containers would be packaged, labeled, marked, and placarded in accordance with RCRA and Department of Transportation requirements.	Applicable	These are applicable requirements for containers that are used to contain hazardous wastes that are sent offsite for disposal.	Joint comments: Applicable to hazardous waste sent off-site for disposal. Usually accomplished on site prior to off-site disposal.	
Chapter 13 Article 1							
8	Hazardous Waste Transportation	Ch. 13 Article 1 §66263	Transportation of hazardous wastes to an offsite disposal facility would be subject to transportation requirements	Applicable	These are applicable requirements for transportation of excavated hazardous wastes offsite for disposal.	Joint comments: Applicable to hazardous waste sent off-site for disposal while waste still on site. Once waste off-site, not an ARAR, but must be independently complied with as applicable.	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
Chapter 14 Article 2							
9.	General Inspection Requirements for Hazardous Waste Landfills	Ch. 14, Article 2, §66264.15(a)	Requires that the owner or operator inspect the disposal facility for malfunctions and deterioration, operator errors, and discharges which may be causing or may lead to: (1) release of hazardous waste constituents to the environment; or (2) a threat to human health. The owner or operator must conduct these inspections often enough to identify problems in time to correct them before they harm human health or the environment.	Relevant and Appropriate	For a selected remedy which requires that the facility be inspected on at least an annual basis to maintain the integrity of the land use controls, stormwater controls, and cover.	Joint comments: Potential ARAR for hazardous waste disposal facility.	
10.	Minimum Standards for Operating a Facility Containing Hazardous Wastes	Ch. 14, Article 2, §66264.16	Personnel training	Probably TBC, but needs to be considered on a case by case basis.		Joint comments: Personnel training requirements are procedural and thus not ARARs.	As a matter of good site management, AF assures that facility personnel have appropriate training to perform their jobs. State staff may review personnel training and raise any concerns to AF.

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
11.	Ignitable, Reactive or Incompatible Wastes	Ch. 14, Article 2, §66264.17(a)(b)	Requires the owner of a facility that disposes ignitable or reactive waste to take precautions to prevent reactions which generate extreme heat or pressure, fire or explosions, or violent reactions; or produce uncontrolled flammables posing a risk of fire or explosions, or toxic mists, fumes, dusts or gasses in sufficient quantities to threaten human health or the environment, damage to the structural integrity of the facility, or through like means threaten human health or the environment.	Relevant and Appropriate	Precautions will be taken during the implementation of the selected remedy to prevent disturbance of any hazardous waste that potentially could be present in the burial trenches to prevent a release of hazardous materials.	Joint comments: Potential ARAR for ignitable, reactive or incompatible hazardous waste..	Appropriate if these wastes are present at the site.

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
12.	Landfill Siting Criteria	Ch. 14, Article 2 §§66264.18-25	California location standards for permitted hazardous waste transfer, treatment, storage, and disposal (TSD) facilities (22 CCR 66264.18[a]) prohibit location of new TSD facilities, or substantial modification of existing facilities, within 200 feet of a Holocene (active) fault. 22 CCR 66264.18(b)(1), which states that TSD facilities within a 100-year floodplain must be designed, constructed, operated, and maintained to prevent washout of any hazardous waste by a 100-year flood.	Potentially Applicable	Seismic standards are applicable and potential <i>ex situ</i> treatment system locations will need to be evaluated with respect to seismic hazards.	<p>Joint comments: Substantive provisions of Sections 66264.18 and 66264.25 on seismic, floodplain and precipitation standards for hazardous waste facilities are potential ARARs.</p> <p>AF comments: Section 66264.19 on a Construction QA Program is probably not an ARAR, because administrative (documentation and reporting). AF has CERCLA QA program in place.</p>	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
Chapter 14 Article 2							
13.	Seismic and Precipitation Design Standards for Hazardous Waste Landfills	Ch. 14, Article 2, §66264.25	Facilities subjected to this chapter and all covers systems and drainage control systems shall be designed to function without failure resulting from a 24-hour probable maximum precipitation storm and to withstand the maximum credible earthquake.	Relevant and Appropriate	Facilities in a selected remedy should be designed to continue to contain the waste after a 24-hour precipitation storm or the maximum credible earthquake. In addition, should facilities be inspected as soon as feasible after these events, and repairs made if required.	Joint comments: Potential ARAR for hazardous waste facilities.	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
Chapter 14 Article 3							
14.	Facility Design, Operation, Equipment, and Communications/Alarms	Ch. 14, Article 13 §66264.31, .32, .34	Facility should be designed to minimize potential for explosion or chemical release. Available should be adequate safety communication system, fire and spill control equipment, and safety water supply. Personnel should be adequately trained to operate safety equipment.	Applicable if hazardous wastes will be left in place		Joint comments: Potential ARAR for hazardous waste facilities.	
Chapter 14 Article 6							
15.		Ch. 14 Article 6 §66264.90-.91 Water Quality Protection Standard.	For each regulated unit, the Department shall establish a water quality protection standard in the facility permit. This water quality protection standard shall consist of the list of constituents of concern.	Relevant and Appropriate		Joint comments: These regulations deal primarily with the circumstances under which other regulations apply. For the applicability of referenced regulations, see comments below regarding those referenced regulations. •Financial Responsibility requirements are administrative and thus not ARARs. CERCLA does not	State comments: If a facility is to be transferred, state staff shall consider raising financial responsibility provisions for the subsequent transferee in the transfer documents.

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						require permits for actions conducted entirely on-site.	
16.		Ch. 14 Article 6 §66264.92. Water Quality Protection Standard.	For each regulated unit, the Department shall establish a water quality protection standard in the facility permit. This water quality protection standard shall consist of the list of constituents of concern.	Relevant and Appropriate		<p>Joint comments: This regulation is a potential ARAR, except for the permit provision. Permits are not required for on-site activities under CERCLA.</p> <p>AF addresses the subjects of this regulation as part of the CERCLA process. The topics are addressed in the RI work plan and RI report, which AF provides to the state.</p>	The CERCLA process provides for development of the cleanup level that should be consistent with the requirements of this regulation. Monitoring points and time period for monitoring should be set forth in the facility monitoring and reporting plan.

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
17.		Ch. 14 Article 6 §66264.93. Constituents of Concern.	Constituents of concern are the waste constituents, reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the regulated unit.	Relevant and Appropriate		<p>Joint comments: This regulation is a potential ARAR, except for the permit reference. Permits are not required for on-site actions under CERCLA.</p> <p>AF addresses the subjects of this regulation as part of the CERCLA process. The topics are addressed in the RI work plan and RI report, which AF provides to the state.</p>	<p>During the investigation phase, the AF and State staff should assure that the investigation is sufficient to provide the information necessary to comply with ARARs, including all constituents of concern.</p> <p>The assessment of nature and extent of release is part of CERCLA process PA/SI and RI.</p>
18.		Ch 14, Article 6, Section 66264.94 Concentration Limits	Establishes RCRA groundwater protection standards and requirements to ensure that hazardous constituents entering the groundwater from a regulated unit do not exceed the concentration limits for contaminants of concern in the uppermost aquifer underlying the waste management area of concern at the point of contact. The COCs are the waste constituents, reaction products, and hazardous constituents reasonably expected to be in or derived from waste contained in the regulated	Potentially applicable for chemical oxidant injection or reinjection of treated groundwater into the aquifer to treat contaminants.	Applies to a regulated unit that receives or has received hazardous waste before 26 July 1982 or regulated units that ceased receiving hazardous waste prior to 26 July 1982 where constituents in or derived from the waste may pose a threat to human health or the environment. Also applicable in defining soil cleanup criteria to be protective of groundwater.	<p>Joint comments: Air Force and State disagree on whether these regulations are potential ARARs. As a practical matter, AF and State have been able to reach agreement on cleanup levels at specific sites. Although AF believes it is not legally required to do so, AF has conducted TEFAs to demonstrate that achievement of background levels is infeasible. TEFAs may be conducted as</p>	<p>If TEFA is appropriate, Air Force and State staff should work together to assure that the RI and the FS develop sufficient information to conduct a TEFA.</p>

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
			unit. Concentrations greater than background can only be used if it is infeasible to reach the background value and the COC will not pose a substantial present or potential hazard to the environment.			<p>a part of the Feasibility Study if appropriate. Another option is to designate an interim cleanup level (such as the MCL) in the Record of Decision and conduct a TEFA after that interim cleanup level is achieved.</p> <p>AF comments: These regulations are probably not potential ARARs. Provisions allowing DTSC to reject proposed concentration limits greater than background with no consideration of risk or protectiveness unless it determines that background is technologically or economically infeasible are not ARARs. Other provisions allowing for MCLs may be ARARs.</p>	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
19.		Ch. 14, Article 6 §66264.95. Monitoring Points and the Point of Compliance.	Department shall specify in the facility permit the point of compliance at which the water quality protection standard of section 66264.92 applies.	Relevant and Appropriate		Joint comments: These regulations are potential ARARs, except for the permit reference. Permits are not required for on-site actions under CERCLA.	The AF and state staff should work together to identify the points of compliance and seek legal advice where they cannot reach agreement.
20.		Ch. 14, Article 6 §66264.96. Compliance Period	Compliance period constitutes the minimum period of time during which the owner or operator shall conduct a water quality monitoring program subsequent to a release from the regulated unit	Relevant and Appropriate		Joint comments: The portions of this regulation regarding the Corrective Action Program (CAP) are potential ARARs for regulated units. See comments above regarding referenced Section 66264.92 AF comments: The portions of this regulation regarding the Evaluation Monitoring Program (EMP) are not a potential ARAR. The EMP is investigatory, designed to determine nature and extent of release from waste management unit. ARARs apply only to remedial actions, not to investigations. State comments:	The AF and state staff should work together to identify the appropriate monitoring parameters and frequencies to comply with the detection and corrective action monitoring requirements for regulated units.

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						Evaluation monitoring generally will have occurred in the investigation phase, but to the extent additional evaluation monitoring is required during the implementation of the remedy it should be identified as an ARAR.	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
21.		Ch. 14, Article 6 §66264.97. Water Quality System Monitoring Requirements	Monitoring program shall include establishing contaminant background levels and sufficient monitoring points to determine contaminant nature/extent. Also to be established are sampling/analytical procedures.	Relevant and Appropriate		<p>Joint comments: The portions of these regulations regarding the Detection Monitoring Program (DMP) and Corrective Action Program (CAP) are potential ARARs for regulated units. AF takes exception to the reporting and recordkeeping provisions.</p> <p>AF comments: Reporting and recordkeeping provisions are considered procedural and thus not eligible to be ARARs. Reporting and record-keeping are generally taken care of in the CERCLA process.</p> <p>The portions of these regulations regarding the Evaluation Monitoring Program (EMP) generally are not a potential ARAR. The EMP is investigatory, designed to determine nature and extent of release from</p>	The AF and state staff should work together to identify the appropriate monitoring parameters and frequencies to comply with the detection and corrective action monitoring requirements for regulated units.

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						<p>waste management unit. ARARs apply only to remedial actions, not to investigations.</p> <p>AF includes these monitoring results in regular monitoring reports prepared under the CERCLA program, which can include Base-Wide Groundwater Monitoring Reports. AF will provide these monitoring reports to State. If an investigation is needed because of a release, the AF will prepare an investigation report under the CERCLA program and provide to the State.</p> <p>State comments: Evaluation monitoring generally will have occurred in the investigation phase, but to the extent additional evaluation monitoring is required during the implementation of the remedy it should be identified as an</p>	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						ARAR.	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
22.		Ch. 14, Article 6 §66264.98. Detection Monitoring Program	Establishes need for list of monitoring parameters and determine if there is a statistically significant probability of a hazardous constituent release	Relevant and Appropriate		<p>Joint comments: These regulations on the Detection Monitoring Program are potential ARARs for regulated units for remedies involving in-situ treatment, except for the provisions allowing DTSC to set water standards below MCLs. AF takes exception to the reporting and recordkeeping provisions.</p> <p>AF comments: Reporting and recordkeeping provisions are considered procedural and thus not eligible to be ARARs. Reporting and record-keeping are generally taken care of in the CERCLA process.</p> <p>AF includes these monitoring results in regular monitoring reports prepared under the CERCLA program, which can include Base-Wide Groundwater</p>	The AF and state staff should work together to identify monitoring parameters and frequencies for regulated units. This ARAR is particularly of concern with respect to in-situ treatment remedies.

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						Monitoring Reports. AF will provide these monitoring reports to State.	
Chapter 14 Article 9							
23.	Container Storage	Ch. 14 Article 9 §§66264.171, 172, 173, 174, 176, 177, and 178	<p>Containers of RCRA hazardous waste must:</p> <ul style="list-style-type: none"> Be maintained in good condition. Be compatible with hazardous waste to be stored. Be closed during storage except to add or remove waste. Have adequate secondary containment when stored onsite. <p>Containers of ignitable or reactive waste must be located at least 50 feet from the facility's property line.</p> <p>Incompatible wastes must not be placed in the same container.</p> <p>All hazardous waste and residues must be removed from the containment system upon closure of the system.</p>	Applicable	These requirements are applicable to hazardous wastes that are generated and stored temporarily in containers at a site prior to offsite disposal and may include wastes such as soil, debris, or treatment residuals (water, sludge, filters).	Joint comments: Potential ARARs for containers of hazardous waste while stored on site.	Container Storage
24.	Container Storage	Ch. 14 Article 9 §66264.175 (a), (b),	Place containers on a sloped, crack-free base,	Applicable	These requirements are applicable to	Joint comments: Potential ARARs for	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
		and (d)	and protect from contact with accumulated liquid. Provide a containment system with a capacity of 10 percent of the volume of containers with liquids. Remove spilled or leaked waste in a timely manner to prevent overflow of containment system		hazardous wastes that are generated and stored temporarily in containers at a site prior to offsite disposal.	containers of hazardous waste while stored on site.	
Chapter 14 Article 10							
25.	Container Storage	Ch. 14 Article 10 §66264.191-.194, and 196	These regulations include requirements to ensure that tanks and ancillary equipment are adequately designed, operated, and maintained to ensure that the tank system will not fail.	Applicable	Substantive portions of these requirements may be applicable to tanks that are used during hazardous waste treatment.	Joint comments: Substantive portions of these regulations are potential ARARs for tanks used during hazardous waste treatment. AF comments: Provisions requiring submissions or reporting to DTSC, approval by DTSC or record keeping are considered procedural and thus not eligible to be ARARs.	AF prepares reports of activities under the CERCLA program. AF shares these reports with the State.
26.	Container Storage	Ch. 14 Article 10 §§66264.199, .200	Special requirements for incompatible wastes and air emissions	Applicable		Joint comments: Section 66264.199 is a potential ARAR for tanks used during hazardous waste treatment. State needs to identify	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						specific regulations referenced in Section 66264.200 for consideration at appropriate sites.	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
Chapter 14 Article 12							
27.	Waste Piles	Ch. 14 Article 12 §§66264.251-.256	Operating and closure requirements for waste piles used to temporarily store wastes.	Relevant and Appropriate		<p>Joint comments: Potential ARARs for hazardous waste treatment piles. AF takes exception to provisions requiring submissions or reporting to DTSC, approval by DTSC or recordkeeping.</p> <p>AF comments: Provisions requiring submissions or reporting to DTSC, approval by DTSC or record keeping are considered procedural and thus not eligible to be ARARs. Reporting and record-keeping are generally taken care of in the CERCLA process.</p>	AF prepares reports of activities under the CERCLA program. AF shares these reports with the State.
Chapter 14 Article 13							
28.	Land Treatment	Ch. 14 Article 13 §§66264.271-.283	Requirements to be followed for demonstration and implementation of hazardous constituent land treatment operations.	Relevant and Appropriate	Applicable if land treatment (in situ) is applied to soils above the water table.	<p>Joint comments: Potential ARARs for land treatment units for hazardous waste, depending on site and treatment method. AF takes exception to provisions requiring</p>	AF prepares reports of activities under the CERCLA program. AF shares these reports with the State.

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						submissions or reporting to DTSC, approval by DTSC or recordkeeping. AF comments: Provisions requiring submissions or reporting to DTSC, approval by DTSC or record keeping are considered procedural and thus not eligible to be ARARs. Reporting and record-keeping are generally taken care of in the CERCLA process.	
Chapter 14 Article 14							
29.	Landfill Design, Operating, and Monitoring Requirements	Ch. 14 Article 14 §66264.301-.304	Identifies design, operation and monitoring of, and response actions for landfills containing hazardous wastes.	Relevant and Appropriate	Requirements for design/construction of, leakage allowance, monitoring, inspection, development and implementation of a plan of action should release be detected.	Joint comments: Potential ARAR if remedy involves the construction of a new hazardous waste landfill. AF takes exception to provisions requiring submissions or reporting to DTSC, approval by DTSC or recordkeeping. AF comments: Provisions requiring submissions or reporting to DTSC,	AF prepares reports of activities under the CERCLA program. AF shares these reports with the State.

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						approval by DTSC or record keeping are considered procedural and thus not eligible to be ARARs. Reporting and record-keeping are generally taken care of in the CERCLA process.	
30.	Surveying Requirements for Hazardous Waste Landfills	Ch. 14 Article 14 §66264.309(a)	Requires establishment of permanently surveyed benchmarks at each cell location with horizontal and vertical controls.	Relevant and Appropriate	Permanently surveyed benchmarks should be installed at each cell location.	<p>Joint comments: The requirement for installation of permanently surveyed benchmarks is a potential ARAR.</p> <p>AF comments: The recordkeeping requirement is not an ARAR because it is procedural.</p> <p>State Comments: Benchmarks are important element of design, and thus relevant and appropriate.</p>	AF maintains records of benchmarks as a good management practice.

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
31.	Closure and Post-Closure Care for Hazardous Waste Landfills	22 CCR, Div. 4.5, Ch. 14, 66264.310(a), (b)(1, 4 & 5)	<p>(a) At final closure of the landfill or upon closure of any cell, the owner or operator shall cover the landfill or cell with a final cover designed and constructed to:</p> <p>(1) prevent the downward entry of water into the closed landfill throughout a period of at least 100 years;</p> <p>(2) function with minimum maintenance;</p> <p>(3) promote drainage and minimize erosion or abrasion of the cover;</p> <p>(4) accommodate settling and subsidence so that the cover's integrity is maintained;</p> <p>(5) accommodate lateral and vertical shear forces generated by the maximum credible earthquake so that the integrity of the cover is maintained;</p> <p>(6) have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present; and</p> <p>(7) conform to the provisions of subsections</p>	Relevant and Appropriate	The selected remedy should comply with the general provisions of these sections. The landfill cover will be designed in accordance with Title 27, Section 20080.	<p>Joint comments: Substantive provisions of this regulation dealing with closure and post closure of hazardous waste facilities are potential ARARs. AF takes exception to administrative requirements, as described below.</p> <p>AF comments: Administrative portions of these regulations probably are not ARARs, such as provisions requiring submissions of reports, plans, notices, certifications or other materials to DTSC, approval by DTSC or record keeping. CERCLA does not require permits or permit applications for actions conducted entirely on-site.</p>	AF will prepare a cover design in a remedial design report under CERCLA program, which is provided to the State.

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
			<p>(e) through (r) of Section 66264.228, except that the Department shall grant a variance from any requirement of subsections (e) through (r) which the owner or operator demonstrates to the satisfaction of the Department is not necessary to protect public health, water quality or other environmental quality.</p> <p>(b) after final closure, the owner or operator must comply with all post-closure requirements contained in Sections 66264.117 through 66264.120, including maintenance and monitoring throughout the post closure care period specified in the permit under Section 66264.117. The owner or operator must:</p> <p>(1) maintain the integrity and effectiveness of the final cover, including making repairs to the cap as necessary to correct the effects of settling, subsidence, erosion, or other events;</p> <p>(4) prevent run-on and run-</p>				

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
			off from eroding or otherwise damaging the final cover; (5) protect and maintain surveyed benchmarks used in complying with Section 66264.309.				

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
32.	Landfill Incompatible Wastes and Bulk and Containerized Liquids	Ch. 14 Article 14 §66264.313-.314	Actions to be applied to incompatible wastes and restrictions on bulk and containerized liquids.	Relevant and Appropriate		Joint comments: Potential ARAR if remedy involves the disposal of hazardous waste to landfill.	If specified materials are present in the landfill
33.	Landfill Moisture Content Requirements	Ch. 14 Article 14 §66264.315, .316, and .318	Minimization of container empty space, special requirements for overpacked lab wastes, and moisture content of bulk and containerized wastes.	Relevant and Appropriate		Joint comments: Potential ARAR if remedy involves the disposal of hazardous waste to landfill.	
Chapter 14 Article 15.5							
34.	Corrective Action for Waste Management Units – Applicability of CAMU Regulations	Ch. 14 Article 15.5 §66264.550-.551	Establishes applicability for various sections of the CAMU regulations. RCRA hazardous waste and combinations of RCRA and non-RCRA hazardous waste managed in the same unit are subject to 66264.552. CAMUs for non-RCRA hazardous waste only are subject to 66264.552.5. CAMUs approved prior to April 22, 2002 or for which applications were submitted to DTSC prior to Nov 20, 2000 are subject to requirements for grandfathered CAMUs in	Applicable	These requirements will apply if a CAMU is used for onsite disposal of RCRA or non-RCRA hazardous waste.	Joint comments: Potential ARAR, if hazardous remediation waste disposed of onsite to CAMU as part of remedy.	State staff should consider consistency with water board regulations.

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
			66264.551.				
35.	Corrective Action Management Unit (CAMU) Requirements	Ch. 14, Article 15.5, §§66264.550-.551 continued	On-site treatment of hazardous remediation wastes are not strictly subject to the LDR treatment standards, but may be subject to similar treatment standards specified in the Corrective Action Management Unit Amendment Rule codified in 40 CFR 264.550-.555 and 22 CCR 66264.550-.553. CAMU requirements also may apply to onsite disposal and temporary storage units managing hazardous remediation wastes.	Potentially Applicable		Joint comments: Sections 66264.550 and 66264.551 are potential ARARs, if hazardous remediation waste disposed of onsite to CAMU as part of remedy.	
36.	Corrective Action for Waste Management Units for RCRA Hazardous Waste	Ch. 14, Article 15.5 §66264.552	Establishes criteria for determining whether waste is CAMU-eligible, criteria for DTSC to designate a CAMU, minimum treatment requirements, adjusted standards (alternate treatment requirements), minimum design	Applicable	These requirements will apply if a CAMU is used for onsite disposal of RCRA hazardous waste.	Joint comments: Substantive provisions of this regulation are a potential ARAR, if hazardous remediation waste disposed of onsite to CAMU as part of remedy. AF takes	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
			requirements, alternate design requirements, groundwater monitoring, closure and post closure requirements. Defines CAMU-eligible waste as all solid and RCRA hazardous wastes, and all media (including ground water, surface water, soils, and sediments) and debris, that are managed for implementing cleanup. As-generated wastes (either RCRA hazardous, non-RCRA hazardous, or non-hazardous) from ongoing industrial operations at a site are not CAMU-eligible wastes.			<p>exception to administrative and certain other provisions, as described below.</p> <p>AF comments: Administrative portions of these regulations probably are not ARARs, such as provisions requiring submission of information, reports, notices, or other materials to DTSC or approval by DTSC. CERCLA does not require permits for actions conducted entirely on-site.</p> <p>Portions of this regulation on investigation of releases from a CAMU and public notice and comment are not a potential ARAR. AF addresses investigation and public notice and comment as part of the CERCLA process.</p>	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
37.	Corrective Action for Waste Management Units for Non-RCRA Hazardous Waste	Ch. 14, Article 15.5 §66264.552.5	Establishes criteria for designating a CAMU for non-RCRA hazardous waste.	Applicable	These requirements will apply if a CAMU is used for onsite disposal of non-RCRA hazardous waste.	<p>Joint comments: Substantive provisions of this regulation are a potential ARAR, if hazardous remediation waste disposed of onsite to CAMU as part of remedy. AF takes exception to administrative and certain other provisions, as described below.</p> <p>AF comments: Administrative portions of these regulations probably are not ARARs, such as provisions requiring submission of information, reports or other materials to DTSC or approval by DTSC. CERCLA does not require permits for actions conducted entirely on-site.</p>	
38.	Corrective Action (Temporary Units)	Ch. 14, Article 15.5 §66264.553	For temporary tanks and container storage areas used for treatment or storage of hazardous remediation waste during corrective action activities,	Applicable	This provision would allow for temporary treatment or storage of hazardous waste that is excavated, stored, and treated	<p>Joint comments: Substantive provisions of this regulation are a potential ARAR, if hazardous remediation waste</p>	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
			it may be determined that a design, operating, or closure standard applicable to such units may be replaced by alternative requirements that are protective of human health or the environment. The temporary unit may be in place for one year with the possibility of a one-year extension		onsite.	temporarily stored or treated onsite. AF takes exception to administrative provisions, as described below. AF comments: Administrative portions of these regulations probably are not ARARs, such as provisions requiring submission of information, reports, notices or other materials to DTSC or approval by DTSC. CERCLA does not require permits for actions conducted entirely on-site.	
Chapter 14 Article 16.							
39.	Treatment	Ch. 14 Article 16 §66264.601	These regulations include design, operation, maintenance, and closure requirements for miscellaneous treatment units and units that use chemical, physical, or biological treatment methods to treat hazardous waste.	Applicable	Substantive portions of these requirements are applicable to units that treat waste ex situ.	Joint comments: Substantive provisions of these regulations are a potential ARAR, if hazardous waste is treated ex situ.	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
Chapter 14 Article 17.							
40.	Monitoring and Response Programs for Air, Soil and Soil Gas	Ch. 14 Article 17 §§66264.701-.708	Soil gas monitoring requirements for sites posing potential vapor intrusion risk.	Applicable	Substantive portions of these requirements are applicable to units containing waste.	Joint comments: Substantive portions of these regulations regarding landfill gas monitoring are potential ARARs. AF comments: Administrative portions are probably not ARARs, such as provisions requiring submissions or reporting to DTSC, approval by DTSC.	
Chapter 16 Article 8							
41.	Recyclable Materials Used in Boilers or Furnaces	Ch. 16 Article 8 §66266.100. Applicability.	The regulations of this article apply to hazardous waste burned or processed in a boiler or industrial furnace.	Potentially Applicable		Joint comments: Substantive portions are a potential ARAR if hazardous remediation waste is burned onsite in a boiler or industrial furnace, unless exempt as provided by the regulation. AF comments: Administrative portions probably are not ARARs, such as	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						provisions requiring submission of information, notices or other materials to DTSC, approval by DTSC or record keeping. CERCLA does not require permits for actions conducted entirely on-site.	
42.	Recyclable Materials Used in Boilers or Furnaces	Ch.16 Article 8 §66266.101. Management Prior to Burning.	Generators, transporters, and storage facilities of hazardous waste that is burned in a boiler or industrial furnace are subject to the applicable provisions of chapter 12, of this division.	Relevant and Appropriate		Joint comments: This regulation incorporates provisions from Chapters 12-15 and 20. See pertinent rows regarding potential ARARs in referenced provisions of Chapters 12-14. State will identify other regulations on a site-specific basis, and AF will consider at that time.	
43.	Recyclable Materials Used in Boilers or Furnaces	Ch.16 Article 8 §66266.102. Permit Standards for Burners.	Owners and operators of boilers and industrial furnaces burning hazardous waste and not operating under interim status shall comply with the requirements of this	Relevant and Appropriate		Joint comments: Substantive portions are a potential ARAR if hazardous remediation waste is burned onsite in a boiler or industrial	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
			section and sections 66270.22 and 66270.66			<p>furnace, unless exempt as provided by the regulation.</p> <p>This regulation incorporates provisions from Chapter 14. See pertinent rows regarding potential ARARs in referenced provisions of Chapter 14. State will identify other regulations on a site-specific basis, and AF will consider at that time.</p> <p>AF comments: Administrative portions probably are not ARARs, such as provisions requiring submission of information, notices, plans, reports or other materials to DTSC, approval by DTSC or record keeping. CERCLA does not require permits or permit applications for actions conducted entirely on-site.</p>	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
44.	Recyclable Materials Used in Boilers or Furnaces	Ch.16 Article 8 §66266.103. Interim Status Standards for Burners.	Establish minimum state standards for owners and operators of "existing" boilers and industrial furnaces that burn hazardous waste where such standards define the acceptable management of hazardous waste during the period of interim status. Applies to owners and operators of existing facilities until either a permit is issued under section 66266.102(d) or until closure responsibilities identified in this section are fulfilled.	Relevant and Appropriate		<p>Joint comments: Substantive portions are a potential ARAR if hazardous remediation waste is burned onsite in a boiler or industrial furnace, unless exempt as provided by the regulation.</p> <p>This regulation incorporates provisions from Chapter 15. State will identify provisions from Chapter 15 on a site-specific basis, and AF will consider at that time.</p> <p>AF comments: Administrative portions probably are not ARARs, such as provisions requiring submission of information, notices, plans, reports, certifications or other materials to DTSC, approval by DTSC or record keeping. CERCLA does not require permits or permit applications for actions conducted entirely on-site.</p>	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
45.	Recyclable Materials Used in Boilers or Furnaces	Ch.16 Article 8 §66266.104. Standards to Control Organic Emissions.	A boiler or industrial furnace burning hazardous waste shall achieve a destruction and removal efficiency (DRE) of 99.99% for all organic hazardous constituents in the waste feed.	Relevant and Appropriate		<p>Joint comments: Substantive portions are a potential ARAR if hazardous remediation waste is burned onsite in a boiler or industrial furnace, unless exempt as provided by the regulation.</p> <p>AF comments: Administrative portions probably are not ARARs, such as provisions requiring submission of information, notices, risk assessments or other materials to DTSC or approval by DTSC. CERCLA does not require permits for actions conducted entirely on-site. When needed, AF conducts risk assessments in accordance with CERCLA procedures and standards.</p>	
46.	Recyclable Materials Used in Boilers or Furnaces	Ch.16 Article 8 §66266.105. Standards to Control Particulate Matter.	A boiler or industrial furnace burning hazardous waste may not emit particulate matter in excess of 180 milligrams per dry standard cubic meter (0.08 grains per dry	Relevant and Appropriate		<p>Joint comments: Potential ARAR if hazardous remediation waste is burned onsite in a boiler or industrial furnace, unless</p>	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
			standard cubic foot) after correction to a stack gas concentration of 7% oxygen.			exempt as provided by the regulation. CERCLA does not require permits for actions conducted entirely on-site.	
47.	Recyclable Materials Used in Boilers or Furnaces	Ch.16 Article 8 §66266.106. Standards to Control Metals Emissions.	The owner or operator shall comply with the metals standards.	Relevant and Appropriate		<p>Joint comments: Substantive portions are a potential ARAR if hazardous remediation waste is burned onsite in a boiler or industrial furnace, unless exempt as provided by the regulation.</p> <p>AF comments: Administrative portions probably are not ARARs, such as provisions requiring submission of information, reports, risk assessments or other materials to DTSC or approval by DTSC. CERCLA does not require permits for actions conducted entirely on-site. When needed, AF conducts risk assessments in accordance with CERCLA procedures and standards.</p>	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
48.	Recyclable Materials Used in Boilers or Furnaces	Ch.16 Article 8 §66266.107. Standards to Control Hydrogen Chloride (HCl) and Chlorine Gas (Cl ₂) Emissions.	The owner or operator shall comply with the hydrogen chloride (HCl) and chlorine (Cl ₂) controls.	Relevant and Appropriate		<p>Joint comments: Substantive portions are a potential ARAR if hazardous remediation waste is burned onsite in a boiler or industrial furnace, unless exempt as provided by the regulation.</p> <p>AF comments: Administrative portions probably are not ARARs, such as provisions requiring submission of information, reports, risk assessments or other materials to DTSC or approval by DTSC. CERCLA does not require permits for actions conducted entirely on-site. When needed, AF conducts risk assessments in accordance with CERCLA procedures and standards.</p>	
49.	Recyclable Materials Used in Boilers or Furnaces	Ch.16 Article 8 §66266.108. Small Quantity On-Site Burner Exemption.	Variety of exemptions pertaining to owners and operators of facilities that burn hazardous waste in an on-site boiler or industrial furnace.	Relevant and Appropriate		<p>Joint comments: Substantive portions are a potential ARAR if hazardous remediation waste is burned onsite in a boiler or industrial</p>	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						furnace. AF comments: Administrative portions probably are not ARARs, such as provisions requiring submission of information, notices or other materials to DTSC or record keeping.	
50.	Recyclable Materials Used in Boilers or Furnaces	Ch.16 Article 8 §66266.109. Low Risk Waste Exemption.	DRE standard of section 66266.104(a) does not apply if the boiler or industrial furnace is operated in conformance with (a)(1) of this section and the owner or operator demonstrates by procedures prescribed in (a)(2) of this section that the burning will not result in unacceptable adverse health effects.	Relevant and Appropriate		Joint comments: Substantive portions are a potential ARAR if hazardous remediation waste is burned onsite in a boiler or industrial furnace, unless exempt as provided by the regulation. AF comments: Administrative portions probably are not ARARs, such as provisions requiring submission of information, risk assessments or other materials to DTSC or approval by DTSC. When needed, AF conducts risk assessments in accordance with CERCLA procedures	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						and standards.	
51.	Recyclable Materials Used in Boilers or Furnaces	Ch.16 Article 8 §66266.110. Waiver of DRE Trial Burn for Boilers.	Trial burn to demonstrate DRE is waived if boilers operate under the special requirements of this section.	Relevant and Appropriate		<p>Joint comments: Substantive portions are a potential ARAR if hazardous remediation waste is burned onsite in a boiler or industrial furnace, unless exempt as provided by the regulation.</p> <p>AF comments: Administrative portions probably are not ARARs, such as provisions requiring submission of information, reports or other materials to DTSC or approval by DTSC.</p>	
52.	Recyclable Materials Used in Boilers or Furnaces	Ch.16 Article 8 §66266.111. Standards for Direct Transfer.	Applies to owners and operators of boilers and industrial furnaces if hazardous waste is directly transferred from a transport vehicle to a boiler or industrial furnace without the use of a storage unit.	Relevant and Appropriate		<p>Joint comments: Substantive portions are a potential ARAR if hazardous remediation waste is burned onsite in a boiler or industrial furnace, unless exempt as provided by the regulation.</p> <p>This regulation incorporates</p>	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						<p>provisions from Chapters 14-15. See pertinent rows regarding potential ARARs in referenced portions of Chapter 14. State will identify other provisions from Chapters 14-15 on a site-specific basis, and AF will consider at that time.</p> <p>AF comments: Administrative portions probably are not ARARs, such as provisions requiring submission of certifications or other materials to DTSC, approval by DTSC or record keeping.</p>	
53.	Recyclable Materials Used in Boilers or Furnaces	Ch.16 Article 8 §66266.112. Regulation of Residues.	Unless the device and the owner or operator meet certain requirements, a residue derived from the burning or processing of hazardous waste in a boiler or industrial furnace is not excluded from the definition of hazardous waste.	Relevant and Appropriate		<p>Joint comments: Substantive portions are a potential ARAR if hazardous remediation waste is burned onsite in a boiler or industrial furnace, unless exempt as provided by the regulation.</p> <p>AF comments: Administrative portions probably are not ARARs, such as</p>	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						provisions requiring submission of information or other materials to DTSC, approval by DTSC or record keeping.	
Chapter 16 Article 9							
54.		Ch. 16 Article 9 §66266.120. Requirements for Management of Waste Elemental Mercury.	A person who transports or stores in a container ten pounds or less of waste elemental mercury shall be exempt from the permit requirements of this division. The operator of a facility which receives ten pounds or less of waste elemental mercury does not have to complete a manifest upon receipt of such quantity of mercury.	Relevant and Appropriate		Joint comments: Potential ARAR if waste elemental mercury remediation waste generated onsite, except for permit provision. CERCLA does not require permits for on-site activities.	
Chapter 16 Article 10							
55.		Ch. 16 Article 10 §66266.130. Management of Used Oil Filters.	Used oil filters are to be managed as hazardous waste unless the conditions in this section are met.	Relevant and Appropriate		Joint comments: Potential ARAR if used oil filters from remediation activities generated onsite.	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
Chapter 18 Article 1							
56.	Hazardous Waste Land Disposal Restrictions	Ch. 18 Article 1 §66268.1	Identifies hazardous wastes that are restricted from land disposal without prior treatment to UTS. Hazardous remediation wastes that are managed off-site are subject to the LDR UTS specified in Section 66268 for wastewater (liquid) and non-wastewater (solid). Hazardous soils must be treated to 90% reduction in concentration capped at 10 times the UTS for principal hazardous constituents (90% capped at 10 x UTS).	Potentially Applicable	LDR applicable to off-site disposal of excavated soil, soil cuttings, and spent carbon if these remediation wastes are RCRA or California hazardous waste, as determined through toxicity characteristic testing using TCLP and TTLC/STLC.	Joint comments: Potential ARAR if hazardous waste placed for disposal in an area outside of a CAMU, treatment unit, or staging pile. LDR provisions also applicable to hazardous waste sent off-site for disposal. Once waste off-site, not an ARAR, but must be independently complied with, as applicable.	Note that Title 27 CCR §§20200(c), 20210, and 20220, and Title 23 CCR §§2520, 2521 require that waste classified as hazardous, designated or nonhazardous solid waste must be disposed to a site consistent with its classification, unless subject to an exemption. See table entitled "Water Board Potential ARARs for Soil/Sediment Remediation, State of California" (Sept. 2010), row nos. 9-13, including comments on applicability. AF and state staff should evaluate Titles 22, 23, and 27 requirements to assure compliance with all applicable requirements.

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
57.		Ch. 18 Article 1 §66268.2. Definitions Applicable in This Chapter.	Definitions of terms applicable in this chapter are provided under section 66260.10.	Potentially Applicable		Joint comments: Not an ARAR. This regulation refers to 22 CCR §66260.10, which contains definitions applicable to Division 4.5. Definitions are needed to help interpret the meaning of substantive requirements. Definitions are not themselves substantive so as to be potential ARARs.	AF and state staff should refer to definitions for clarity.
58.		Ch. 18 Article 1 §66268.3. Dilution Prohibited As a Substitute for Treatment.	No generator, transporter, handler, or owner or operator of a treatment, storage, or disposal facility shall in any way dilute a restricted waste or the residual from treatment of a restricted waste as a substitute for adequate treatment to achieve compliance.	Relevant and Appropriate		Joint comments: Potential ARAR if hazardous waste placed for disposal in an area outside of a CAMU, treatment unit, or staging pile. LDR provisions also applicable to hazardous waste sent off-site for disposal. Once waste off-site, not an ARAR, but must be independently complied with, as applicable.	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
59		Ch. 18 Article 1 §66268.5. Procedures for Case-By-Case Extensions to an Effective Date.	Any person who generates, treats, stores, or disposes of a hazardous waste may submit an application for an extension to the effective date of any applicable restriction.	Relevant and Appropriate		Joint comments: Potential ARAR if hazardous waste placed for disposal in an area outside of a CAMU, treatment unit, or staging pile. LDR provisions also applicable to hazardous waste sent off-site for disposal. Once waste off-site, not an ARAR, but must be independently complied with, as applicable.	
60.		Ch. 18 Article 1 §66268.6. Petitions to Allow Land Disposal of a Waste Prohibited Under Article 3 of Chapter 18.	For hazardous waste subject to RCRA land disposal restrictions, applicant shall petition the U.S. EPA Administration for an exemption. Applicant shall submit a copy of EPA approved petition to the Department.	Relevant and Appropriate		Joint comments: Potential ARAR if hazardous waste placed for disposal in an area outside of a CAMU, treatment unit, or staging pile. LDR provisions also applicable to hazardous waste sent off-site for disposal. Once waste off-site, not an ARAR, but must be independently complied with, as applicable.	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
61.		Ch. 18 Article 1 §66268.7, Testing, Tracking, and Recordkeeping Requirements for Generators, Treaters and Disposal Facilities.	A generator of hazardous waste shall determine if the waste has to be treated before it can be land disposed.	Relevant and Appropriate		<p>Joint comments: Once waste off-site, not an ARAR, but must be independently complied with, as applicable.</p> <p>AF comments: This regulation is not an ARAR for on-site activities, because it sets forth procedural and administrative requirements.</p>	
62.		Ch. 18 Article 1 §66268.9. Special Rules Regarding Wastes That Exhibit a Characteristic.	The initial generator of a waste shall determine each EPA Hazardous Waste Number (waste code) applicable to the waste in order to determine the applicable treatment standards under article 4 in this chapter.	Potentially Applicable		<p>Joint comments: Potential ARAR if hazardous waste placed for disposal in an area outside of a CAMU, treatment unit, or staging pile. LDR provisions also applicable to hazardous waste sent off-site for disposal. Once waste off-site, not an ARAR, but must be independently complied with, as applicable.</p>	
63.	EPA guidance on LDR	53 Federal Register 51444 and 55 Federal Register 8758	Allows remediation waste to be moved within a single area of contamination without triggering LDR	To be considered	To be considered when consolidating waste. U.S. Environmental	<p>Joint comments: EPA's guidance that LDRs do not apply to movement of waste within an area of</p>	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
			requirements		Protection Agency, Area of Contamination Policy	contamination is to be considered.	
Chapter 18 Article 2							
64.		Ch. 18 Article 2 §66268.29. List of Restricted Non-RCRA Hazardous Wastes,	Non-RCRA hazardous wastes are subject to land disposal restrictions specified in this article.	Relevant and Appropriate		Joint comments: Potential ARAR if hazardous waste placed for disposal in an area outside of a CAMU, treatment unit, or staging pile. LDR provisions also applicable to hazardous waste sent off-site for disposal. Once waste off-site, not an ARAR, but must be independently complied with, as applicable.	
Chapter 18 Article 3							
65.		Ch. 18 Article 3 §66268.30. Waste Specific Prohibitions--Wood Preserving Wastes.	Wood Preserving wastes are prohibited from land disposal.	Potentially Applicable		Joint comments: Potential ARAR if hazardous waste placed for disposal in an area outside of a CAMU, treatment unit, or staging pile. LDR provisions also applicable to	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						hazardous waste sent off-site for disposal. ARAR determination not needed if off-site.	
66.		Ch. 18 Article 3 §66268.31. Waste Specific Prohibitions--Dioxin-Containing Wastes.	Unless under certain conditions, Dioxin-Containing Wastes are prohibited from land disposal.	Potentially Applicable		Joint comments: Potential ARAR if hazardous waste placed for disposal in an area outside of a CAMU, treatment unit, or staging pile. LDR provisions also applicable to hazardous waste sent off-site for disposal. Once waste off-site, not an ARAR, but must be independently complied with, as applicable.	
67.		Ch. 18 Article 3 §66268.31.5. Waste Specific Prohibitions - Soils Exhibiting the Toxicity Characteristic for Metals and Containing PCBs.	Any volumes of soil exhibiting the toxicity characteristic solely because of the presence of metals (D004-D011) and containing PCBs are prohibited from land disposal.	Potentially Applicable		Joint comments: Potential ARAR if hazardous waste placed for disposal in an area outside of a CAMU, treatment unit, or staging pile. LDR provisions also applicable to hazardous waste sent off-site for disposal. Once waste off-site, not an ARAR, but must be independently complied with, as	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						applicable.	
68.		Ch. 18 Article 3 §66268.32. Waste Specific Prohibitions-- California List Wastes.	Liquid hazardous wastes, including free liquids associated with any solid or sludge, containing free cyanides at concentrations greater than or equal to 1000 mg/l and PCBs at concentrations greater than or equal to 50 ppm are prohibited from land disposal.	Relevant and Appropriate		Joint comments: Potential ARAR if hazardous waste placed for disposal in an area outside of a CAMU, treatment unit, or staging pile. LDR provisions also applicable to hazardous waste sent off-site for disposal. Once waste off-site, not an ARAR, but must be independently complied with, as applicable.	
69.		Ch. 18 Article 3 §66268.33. Waste Specific Prohibitions-- Chlorinated Aliphatic Wastes.	Chlorinated Aliphatic Wastes are prohibited from land disposal.	Relevant and Appropriate		Joint comments: Potential ARAR if hazardous waste placed for disposal in an area outside of a CAMU, treatment unit, or staging pile. LDR provisions also applicable to hazardous waste sent off-site for disposal. Once waste off-site, not an ARAR, but must be independently	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						complied with, as applicable.	
70.		Ch. 18 Article 3 §66268.34. Waste Specific Prohibitions-- Toxicity Characteristic Metal Wastes,	Toxicity Characteristic Metal Wastes are prohibited from land disposal.	Relevant and Appropriate		Joint comments: Potential ARAR if hazardous waste placed for disposal in an area outside of a CAMU, treatment unit, or staging pile. LDR provisions also applicable to hazardous waste sent off-site for disposal. Once waste off-site, not an ARAR, but must be independently complied with, as applicable.	
71.		Ch. 18 Article 3 §66268.37. Waste Specific Prohibitions- Ignitable and Corrosive Characteristic Wastes Whose Treatment Standards Were Vacated.	Wastes that are managed in systems other than those whose discharge is regulated under the Clean Water Act (CWA) or that are zero dischargers that engage in CWA-equivalent treatment before ultimate land disposal, are prohibited from land disposal.	Relevant and Appropriate		Joint comments: Potential ARAR if hazardous waste placed for disposal in an area outside of a CAMU, treatment unit, or staging pile. LDR provisions also applicable to hazardous waste sent off-site for disposal. Once waste off-site, not an ARAR, but must be independently complied with, as	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						applicable.	
72.		Ch. 18 Article 3 §66268.38. Waste Specific Prohibitions-Newly Identified Organic Toxicity Characteristic Wastes and Newly Listed Coke By-Product and Chlorotoluene Production Wastes.	Newly identified organic toxicity characteristic wastes and newly listed coke by-product and chlorotoluene production wastes are prohibited from land disposal.	Relevant and Appropriate		Joint comments: Potential ARAR if hazardous waste placed for disposal in an area outside of a CAMU, treatment unit, or staging pile. LDR provisions also applicable to hazardous waste sent off-site for disposal. Once waste off-site, not an ARAR, but must be independently complied with, as applicable.	
73.		Ch. 18 Article 3 §66268.39. Waste Specific Prohibitions--Spent Aluminum Potliners; Reactive; and Carbamate Wastes.	Spent aluminum potliners; reactive; and carbamate wastes are prohibited from land disposal. In addition, soil and debris contaminated with these wastes are prohibited from land disposal.	Relevant and Appropriate		Joint comments: Potential ARAR if hazardous waste placed for disposal in an area outside of a CAMU, treatment unit, or staging pile. LDR provisions also applicable to hazardous waste sent off-site for disposal. Once waste off-site,	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						not an ARAR, but must be independently complied with, as applicable.	
74.		Ch. 18 Article 3 §66268.39.5. Waste Specific Prohibitions - Newly Listed and Identified Wastes.	All newly identified D004-D011 wastes and characteristic mineral processing wastes, except those identified in subsection (b) of this section, are prohibited from underground injection.	Relevant and Appropriate		Joint comments: Potential ARAR if hazardous waste placed for disposal in an area outside of a CAMU, treatment unit, or staging pile. LDR provisions also applicable to hazardous waste sent off-site for disposal. Once waste off-site, not an ARAR, but must be independently complied with, as applicable.	
Chapter 18 Article 4							

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
75.	Excavation	Ch. 18 Article 4 §66268.40	Movement of excavated materials characterized as hazardous to new location or placement in or on land will trigger LDRs.	Applicable	Applicable if excavated soil and waste characterized as hazardous waste is placed on land (e.g., accumulation of soil prior to disposal).	Joint comments: Potential ARAR if hazardous waste placed for disposal in an area outside of a CAMU, treatment unit, or staging pile. LDR provisions also applicable to hazardous waste sent off-site for disposal. Once waste off-site, not an ARAR, but must be independently complied with, as applicable.	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
76.		Ch. 18 Article 4 §66268.40. Applicability of Treatment Standards.	"Treatment Standards for Hazardous Wastes" may be land disposed only if it meets the requirements found in the table from this section.	Potentially Applicable		Joint comments: Potential ARAR if hazardous waste placed for disposal in an area outside of a CAMU, treatment unit, or staging pile. LDR provisions also applicable to hazardous waste sent off-site for disposal. Once waste off-site, not an ARAR, but must be independently complied with, as applicable.	
77.		Ch. 18 Article 4 §66268.41. Treatment Standards Expressed As Concentrations in Waste Extract.	Treatment Standards Expressed As Concentrations in Waste Extract.	Potentially Applicable		Joint comments: Potential ARAR if hazardous waste placed for disposal in an area outside of a CAMU, treatment unit, or staging pile. LDR provisions also applicable to hazardous waste sent off-site for disposal. Once waste off-site, not an ARAR, but must be independently complied with, as applicable.	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
78.		Ch. 18 Article 4 §66268.42. Treatment Standards Expressed As Specified Technologies.	"Treatment Standards for Hazardous Wastes," for which standards are expressed as a treatment method rather than a concentration level, shall be treated using the technology or technologies specified in the table entitled "Technology Codes and Description of Technology-Based Standards" in this section.	Potentially Applicable		Joint comments: Potential ARAR if hazardous waste placed for disposal in an area outside of a CAMU, treatment unit, or staging pile. LDR provisions also applicable to hazardous waste sent off-site for disposal. Once waste off-site, not an ARAR, but must be independently complied with, as applicable.	
79.		Ch.18 Article 4 §66268.43. Treatment Standards Expressed As Waste Concentrations.	For the requirements previously found in this section and for treatment standards in Table CCW - Constituent Concentrations in Wastes, refer to section 66268.40.	Potentially Applicable		Joint comments: Potential ARAR if hazardous waste placed for disposal in an area outside of a CAMU, treatment unit, or staging pile. LDR provisions also applicable to hazardous waste sent off-site for disposal. Once waste off-site, not an ARAR, but must be independently complied with, as applicable.	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
80.		Ch.18 Article 4 §66268.44. Variance from a Treatment Standard.	USEPA Administrator may approve a variance if it is not physically possible to treat the waste or it is inappropriate to require the waste to be treated.	Potentially Applicable		Joint comments: Once waste off-site, not an ARAR, but must be independently complied with, as applicable. AF comments: This regulation is not an ARAR for on-site activities, because it sets forth procedural requirements.	Any treatment standards are determined during the CERCLA process. EPA would have an opportunity to comment during the CERCLA process.
81.		Ch. 18 Article 4 §66268.45. Treatment Standards for Hazardous Debris.	Hazardous debris shall be treated prior to land disposal as follows unless the Department determines debris is no longer contaminated with hazardous waste or the debris is treated to the waste-specific treatment standard.	Potentially Applicable		Joint comments: Potential ARAR if hazardous debris placed for disposal in an area outside of a CAMU, treatment unit, or staging pile. LDR provisions also applicable to hazardous waste sent off-site for disposal. Once waste off-site, not an ARAR, but must be independently complied with, as applicable.	
82.	Disposal – Treatment Standards for Hazardous Debris	Ch. 18 Article 4 §66268.45	Requires treatment of hazardous debris prior to land disposal to waste-specific treatment standards	Applicable	Applicable to any debris identified as hazardous during excavation of disposal pits if debris will be	Joint comments: Potential ARAR if hazardous waste placed for disposal in an area outside of a	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
					placed for disposal in an area outside of a CAMU, treatment unit, or staging pile. Also applicable to off site disposal of debris.	CAMU, treatment unit, or staging pile. LDR provisions also applicable to hazardous waste sent off-site for disposal. Once waste off-site, not an ARAR, but must be independently complied with, as applicable.	
83.	California Land Disposal Restrictions Universal treatment standards	Ch. 18 Article 4 §66268.48	This requirement establishes numeric universal treatment standards by chemical constituent that may not be exceeded under the land disposal restrictions. Following excavation, contaminated soil determined to be hazardous waste in accordance with state and federal regulations may be subject to land disposal restrictions (LDR) if placed on land in a waste management unit (other than a CAMU for which treatment requirements have been waived) outside of the Area of Contamination from which the waste was generated. Toxicity characteristic waste needs to be treated	Applicable 2 years plus one 6-month extension period. 2-year limit measured from the initial placement of remediation waste in pile	The selected remedy will use a value of 10X UTS to verify whether excavated soil is subject to land disposal restrictions. Provide greater flexibility when implementing remedial action by allowing short-term storage to occur under circumstances that are protective of human health and the environment, without the extensive set of standards that may be required for units in long-term use. Long-term and complex activities such as treatment and permanent disposal is not	Joint comments: Potential ARAR if hazardous waste placed for disposal in an area outside of a CAMU, treatment unit, or staging pile. LDR provisions also applicable to hazardous waste sent off-site for disposal. Once waste off-site, not an ARAR, but must be independently complied with, as applicable.	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
			so that it (1) no longer exhibits the characteristic of toxicity, and (2) is treated to 10 times the Universal Treatment Standard (10X UTS) or achieves 90 percent reduction, whichever is higher. Non-flowing hazardous <u>remediation</u> waste (includes soil, debris, and sludge)		allowed in staging pile. Piles must be closed after performance period (all piles cleared, site cleaned). Staging piles shall only be used during remediation, a process that is specifically designed to facilitate proper recovery, treatment or disposal of wastes. Must be "designated."		

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
84.		Ch. 18 Article 4 §66268.48. Universal Treatment Standards.	The UTS table identifies the hazardous constituents, along with the non-wastewater and wastewater treatment standard levels, that are used to regulate most prohibited hazardous wastes with numerical limits.	Relevant and Appropriate		Joint comments: Potential ARAR if hazardous waste placed for disposal in an area outside of a CAMU, treatment unit, or staging pile. LDR provisions also applicable to hazardous waste sent off-site for disposal. Once waste off-site, not an ARAR, but must be independently complied with, as applicable.	
85.		Ch. 18 Article 4 §66268.49. Alternative LDR Treatment Standards for Contaminated Soil.	Applicability table for compliance with LDRs prior to placing soil that exhibits a characteristic of hazardous waste, or exhibited a characteristic of hazardous waste at the time it was generated, into a land disposal unit.	Relevant and Appropriate		Joint comments: Potential ARAR if hazardous waste placed for disposal in an area outside of a CAMU, treatment unit, or staging pile. LDR provisions also applicable to hazardous waste sent off-site for disposal. Once waste off-site, not an ARAR, but must be independently complied with, as applicable.	
Chapter 18 Article 5							

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
86.		Ch. 18 Article 5 §66268.50. Prohibitions on Storage of Restricted Wastes.	Storage of hazardous wastes restricted from land disposal is prohibited, unless a generator and or owner/operator stores such wastes in tanks, containers, or containment buildings on site solely for the purpose of the accumulation of such quantities of hazardous waste as necessary to facilitate proper recovery, treatment, or disposal.	Relevant and Appropriate		Joint comments: Potential ARAR for storage of hazardous remediation waste subject to LDR prior to off-site disposal.	
Chapter 18 Article 10							
87.		Ch. 18 Article 10 §66268.100. Waste Specific Prohibitions.	Various non-RCRA hazardous wastes listed in this section are subject to prohibition.	Relevant and Appropriate		Joint comments: Potential ARAR if hazardous waste placed for disposal in an area outside of a CAMU, treatment unit, or staging pile. LDR provisions also applicable to hazardous waste sent off-site for disposal. Once waste off-site, not an ARAR, but must be independently complied with, as applicable.	
Chapter 18 Article 11							

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
88.		Ch. 18 Article 11 §66268.105. Applicability of Treatment Standards.	A restricted waste identified in section 66268.106 and 107 may be land disposed without further treatment only if an extract of the waste or of the treatment residue of the waste does not exceed the value shown in Table I-CCWE of section 66268.106 and 107.	Potentially Applicable		Joint comments: Potential ARAR if hazardous waste placed for disposal in an area outside of a CAMU, treatment unit, or staging pile. LDR provisions also applicable to hazardous waste sent off-site for disposal. Once waste off-site, not an ARAR, but must be independently complied with, as applicable.	
89.		Ch. 18 Article 11 §66268.106. Treatment Standards Expressed As Concentrations in Waste Extract.	CCWE tables in this section identify the restricted wastes and the concentrations of their associated hazardous constituents, which may not be exceeded by the extract of a waste or waste treatment residual.	Potentially Applicable		Joint comments: Potential ARAR if hazardous waste placed for disposal in an area outside of a CAMU, treatment unit, or staging pile. LDR provisions also applicable to hazardous waste sent off-site for disposal. Once waste off-site, not an ARAR, but must be independently complied with, as applicable.	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
90.		Ch. 18 Article 11 §66268.107. Treatment Standards Expressed As Waste Concentrations.	Table II-CCW identifies the non-RCRA metal-containing aqueous wastes and the concentrations of their associated hazardous constituents.	Potentially Applicable		Joint comments: Potential ARAR if hazardous waste placed for disposal in an area outside of a CAMU, treatment unit, or staging pile. LDR provisions also applicable to hazardous waste sent off-site for disposal. Once waste off-site, not an ARAR, but must be independently complied with, as applicable.	
91.		Ch. 18 Article 11 §66268.114. Treatment Standard for Asbestos-Containing Waste.	Asbestos-containing waste shall be treated using one of the methods provided in this section.	Potentially Applicable		Joint comments: Potential ARAR if asbestos-containing waste placed for disposal in an area outside of a CAMU, treatment unit, or staging pile. LDR provisions also applicable to hazardous waste sent off-site for disposal. Once waste off-site, not an ARAR, but must be independently complied with, as applicable.	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
			A hazardous waste producer may request in writing, an emergency variance from the Department.				
Chapter 23 Article 1							
92.	Universal Waste Management	Ch. 23 Article 1 §66273.3. Applicability-Electronic Devices.	Discarded electronic devices that are hazardous may be managed as a universal waste unless they are devices not covered pursuant to this chapter.	Potentially Applicable		Joint comments: Potential ARAR for universal waste from remedial activities.	
93.	Universal Waste Management	Ch. 23 Article 1 §66273.4. Applicability-Mercury-Containing Equipment.	The requirements of this chapter apply to persons managing the mercury-containing equipment listed in the section.	Potentially Applicable		Joint comments: Potential ARAR for universal waste from remedial activities.	
94.	Universal Waste Management	Ch. 23 Article 1 §66273.5. Applicability-Lamps.	The requirements of this chapter apply to persons managing the various lamps listed in this section.	Potentially Applicable		Joint comments: Potential ARAR for universal waste from remedial activities.	
95.	Universal Waste Management	Ch. 23 Article 1 §66273.6. Applicability-Cathode Ray Tubes (CRTs).	The requirements of this chapter apply to CRTs except those listed in subsection (b) of this section.	Potentially Applicable		Joint comments: Potential ARAR for universal waste from remedial activities.	
96.	Universal Waste Management	Ch. 23 Article 1 §66273.7. Applicability-Cathode Ray Tube (CRT) Glass.	The requirements of this chapter apply to CRT glass except CRT glass listed in subsection (b) of this section.	Potentially Applicable		Joint comments: Potential ARAR for universal waste from remedial activities.	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
97.	Universal Waste Management	Ch. 23 Article 1 §66273.8. Exemptions.	A person who maintains a household and who produces universal waste derived from that household, is a generator of household universal waste. Such a generator is exempt from the requirements of this chapter applicable to a universal waste handler.	Potentially Applicable		Joint comments: Potential ARAR for universal waste from remedial activities.	
98.	Universal Waste Management	Ch. 23 Article 1 §66273.9. Definitions.	Definitions to various terms.	Potentially Applicable		Joint comments: Not an ARAR. This regulation contains definitions applicable to Chapter 23. Definitions are needed to help interpret the meaning of substantive requirements. Definitions are not themselves substantive so as to be potential ARARs.	AF and state staff should refer to definitions for clarity.

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
Chapter 23 Article 3							
99.	Universal Waste Handlers Standards	Ch. 23 Article 3 §66273.30. Applicability.	Applies to universal waste handlers (as defined in section 66273.9	Potentially Applicable		Joint comments: Potential ARAR for universal waste from remedial activities.	
100.	Universal Waste Handlers Standards	Ch. 23 Article 3 §66273.31. Prohibitions.	A universal waste handler is prohibited from disposing of universal waste and prohibited from diluting or treating universal waste unless under the specific conditions listed in this section	Relevant and Appropriate		Joint comments: Potential ARAR for universal waste from remedial activities.	
101.	Universal Waste Handlers Standards	Ch. 23 Article 3 §66273.32. USEPA Notification, Department Notification, and Reporting Requirements for Universal Waste Handlers.	A universal waste handler shall have sent written notification of universal waste management to the Regional Administrator, and received a federal ID Number, before accumulating 5,000 kilograms of universal waste.	Relevant and Appropriate		Joint comments: This regulation is not an ARAR for on-site activities, because it sets forth procedural requirements. It is applicable to waste disposed off-site, under other independent authority.	
102.	Universal Waste Handlers Standards	Ch. 23 Article 3 §66273.33	Standards for batteries, lamps and mercury containing equipment	Relevant and Appropriate		Joint comments: Potential ARAR for universal waste from remedial activities.	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
103.	Universal Waste Handlers Standards	Ch. 23 Article 3 §66273.33,5	Standards for CRTs and electronic equipment			<p>Joint comments: Potential ARAR for universal waste from remedial activities.</p> <p>This regulation incorporates other provisions from Chapter 23. See pertinent rows regarding potential ARARs in referenced provisions of Chapter 23.</p>	
104.	Universal Waste Handlers Standards	Ch. 23 Article 3 §66273.34	Labeling			<p>Joint comments: Potential ARAR for universal waste from remedial activities.</p>	
105.	Universal Waste Handlers Standards	Ch. 23 Article 3 §66273.35	Accumulation time limits			<p>Joint comments: Potential ARAR for universal waste from remedial activities.</p>	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
106.	Universal Waste Handlers Standards	Ch. 23 Article 3 §66273.36	Personnel training			Joint comments: Personnel training requirements are procedural and thus not ARARs.	As a matter of good site management, AF assures that facility personnel have appropriate training to perform their jobs. State staff may review personnel training and raise any concerns to AF.
107.	Universal Waste Handlers Standards	Ch. 23 Article 3 §66273.37	Responses to releases			Joint comments: Potential ARAR for universal waste from remedial activities.	
108.	Universal Waste Handlers Standards	Ch. 23 Article 3 §66273.38	Offsite shipping requirements			Joint comments: Potential ARAR for universal waste from remedial activities.	
109.	Universal Waste Handlers Standards	Ch. 23 Article 3 §66273.39	tracking			Joint comments: Once waste off-site, not an ARAR, but must be independently complied with, as applicable. AF comments: Tracking requirements are procedural and thus	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						not ARARs.	
Chapter 32							
110.	Tanks Management	Chapter 32 §67383.1. Applicability.	Establishes minimum standards for the management of all underground and aboveground tank systems that held hazardous waste or hazardous materials.	Potentially Applicable		Joint comments: Potential ARAR for disposal, reclamation or closure in place of hazardous waste tank system, unless exempt as provided by the regulation.	
111.	Tanks Management	Chapter 32 §67383.2. Definitions.	Definitions to various terms.	Potentially Applicable		Joint comments: Not an ARAR. This regulation contains definitions applicable to Chapter 32. Definitions are needed to help interpret the meaning of substantive requirements. Definitions are not themselves substantive so as to be potential ARARs.	AF and state staff should refer to definitions for clarity.

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
112.	Tanks Management	Chapter 32 §67383.3. General Standards for Tank Systems.	Any tank system that is identified as a hazardous waste shall be exempt from regulation under this division if the tank system is managed in accordance with all of the requirements of this section.	Relevant and Appropriate		<p>Joint comments: Substantive portions are a potential ARAR for disposal, reclamation or closure in place of hazardous waste tank system, unless exempt as provided by the regulation.</p> <p>AF comments: Administrative portions probably are not ARARs, such as provisions requiring submission of notices, certifications or other materials to DTSC or other state or local entities or approval by DTSC or other state or local entities.</p>	
113.	Tanks Management	Chapter 32 §67383.4. Management Procedure to Close Hazardous Material or Hazardous Waste Tank Systems in Place.	Owner or operator of a tank system to be closed in place shall, comply with Section 25298 of the Health and Safety Code, obtain CUPA, clean the tank, and fill the tank with a solid inert material.	Relevant and Appropriate		<p>Joint comments: Substantive portions are a potential ARAR for disposal, reclamation or closure in place of hazardous waste tank system, unless exempt as provided by the regulation.</p> <p>AF comments: Administrative portions probably are</p>	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						not ARARs, such as provisions requiring submission of information, reports or other materials to DTSC or other state or local entities or approval by DTSC or other state or local entities.	
114.	Tanks Management	Chapter 32 §67383.5. Transportation of Uncut Tanks that Contained Hazardous Material or Hazardous Waste.	Requirements for transportation in this section shall apply to any tank intended to be transported, that is not cut onsite, has been cleaned pursuant to the provisions of section 67383.3, and has the potential to generate flammable vapors.	Potentially Applicable		<p>Joint comments: Substantive portions are a potential ARAR for disposal, reclamation or closure in place of hazardous waste tank system, unless exempt as provided by the regulation.</p> <p>AF comments: Administrative portions probably are not ARARs, such as provisions requiring submission of information, reports or other materials to DTSC or other state or local entities or approval by DTSC or other state or local entities.</p>	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
Chapter 34							
115.	Treated Wood Waste	Chapter 34 §67386.1 Scope and Applicability	Provides an alternative set of management standards in lieu of the requirements for hazardous waste	Potentially Applicable		Joint comments: Potential ARAR for treated wood waste.	
116.	Treated Wood Waste	Chapter 34 §67386.2 Applicability	Alternative management standards of this chapter apply only to wood waste that meets all of the criteria in the section.	Potentially Applicable		Joint comments: Potential ARAR for treated wood waste.	
117.	Treated Wood Waste	Chapter 34 §67386.3 Prohibited Activities	List of the Prohibited Activities in regards to TWW managed in accordance with the alternative management standards.	Relevant and Appropriate		Joint comments: Potential ARAR for treated wood waste.	
118.	Treated Wood Waste	Chapter 34 §67386.4 Definitions	Definitions to various terms.	Potentially Applicable		Joint comments: Not an ARAR. This regulation contains definitions applicable to Chapter 34. Definitions are needed to help interpret the meaning of substantive requirements. Definitions are not themselves substantive so as to be potential ARARs.	AF and state staff should refer to definitions for clarity.
119.	Treated Wood Waste	Chapter 34 §67386.5 Labeling	TWW generated, accumulated, stored, or transported within California shall be clearly marked and visible for inspection.	Potentially Applicable		Joint comments: Potential ARAR for treated wood waste.	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
120.	Treated Wood Waste	Chapter 34 §67386.6 Accumulation	TWW shall be maintained in a manner that prevents unauthorized access and minimizes release to the environment.	Potentially Applicable		Joint comments: Potential ARAR for treated wood waste.	
121.	Treated Wood Waste	Chapter 34 §67386.7 Offsite Shipments	A TWW handler is prohibited from sending or taking TWW to a place other than a TWW facility, or a TWW approved landfill.	Potentially Applicable		Joint comments: Potential ARAR for treated wood waste.	
122.	Treated Wood Waste	Chapter 34 §67386.8 Tracking Shipments	A TWW handler shall keep a record of each shipment of TWW sent from the handler to TWW facilities.	Potentially Applicable		Joint comments: Once waste off-site, not an ARAR, but must be independently complied with, as applicable. AF comments: Tracking requirements are procedural and thus not ARARs.	
123.	Treated Wood Waste	Chapter 34 §67386.9 Notification	If a TWW handler generates more than 10,000 pounds of TWW, the TWW handler shall obtain or maintain an Identification Number within 30 days of exceeding the weight threshold.	Potentially Applicable		Joint comments: Once waste off-site, not an ARAR, but must be independently complied with, as applicable. AF comments: Reporting requirements are procedural and thus not ARARs for on-site activities.	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
124.	Treated Wood Waste	Chapter 34 §67386.10 Treatment	Treatment of treated wood waste managed in accordance with the alternative management standards of this chapter is prohibited except as provided in subsections (b) and (c).	Potentially Applicable		Joint comments: Potential ARAR for treated wood waste.	
125.	Treated Wood Waste	Chapter 34 §67386.11 Disposal	When disposed to land, TWW shall be disposed in either a Class I hazardous waste landfill, or in a composite-lined portion of a solid waste landfill unit.	Potentially Applicable		Joint comments: Potential ARAR for treated wood waste.	
126.	Treated Wood Waste	Chapter 34 §67386.12 Training	An employer managing TWW shall provide training for all employees handling TWW.	Potentially Applicable		Joint comments: Personnel training requirements are procedural and thus not ARARs.	As a matter of good site management, AF assures that facility personnel have appropriate training to perform their jobs. State staff may review personnel training and raise any concerns to AF.
127.	Hazardous Waste Property	Title 22 CCR §67390.2	Requirements for designation of hazardous waste property; consideration of property within 2000 feet	Potentially Applicable		Joint comments: Potential ARAR for property covered by regulation.	
128.	Hazardous Waste Property / Land Use Covenants	Title 22 CCR §67391.1	Requirements for land use covenants when property not suitable for unrestricted use	Relevant and Appropriate		Joint comments: Substantive portions of §67391.1(b), (e) and (f) are potential ARARs.	AF staff should contact AFLOA / JACE-FSC for the latest guidance on approach to institutional controls. State staff should

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						State comments: All provisions of §67391.1 are potential ARARs.	contact their agency legal office.
129.	Land use covenants	California Civil Code §1471(a) through (d)	Provides conditions for land use restrictions to run with the land and bind successive owners	Relevant and Appropriate		<p>Joint comments: Civil Code §1471(a) is a potential ARAR for the scope of land use controls described in the ROD that would apply to a nonfederal transferee of a site that does not allow for unrestricted use.</p> <p>AF comments: Civil Code §1471(b)-(d) is not a potential ARAR because it does not address the responsibilities of AF. Civil Code §1471(b)-(d) addresses the extent to which land use covenants are binding on transferees and their successors.</p>	As part of the transfer of land that does not allow for unrestricted use, AF requires a nonfederal transferee to execute an appropriate land use covenant under 22 CCR § 67391.1 with the state as part of the transfer process. AF staff should contact AFLOA / JACE-FSC for the latest guidance on approach to institutional controls. State staff should contact their agency legal office.
130.	Land use covenants	California Health & Safety Code §25202.5	Land use covenants for hazardous waste facilities	Relevant and Appropriate		Joint comments: Potential ARAR for the scope of land use controls described in the ROD that would apply to a nonfederal transferee of a hazardous waste	As part of the transfer of land that does not allow for unrestricted use, AF requires a nonfederal transferee to execute an appropriate land use covenant under 22

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						<p>facility that does not allow for unrestricted use.</p> <p>AF comments: References to permits and interim status are not potential ARARs because CERCLA does not require permits for actions conducted entirely on-site.</p> <p>Approval by DTSC is an administrative requirement and thus not an ARAR.</p> <p>State comments: Since California is a RCRA-authorized state, where there are any permitted hazardous waste facilities, or facilities granted interim status, this statute is a potential ARAR.</p>	CCR § 67391.1 with the state as part of the transfer process. AF staff should contact AFLOA / JACE-FSC for the latest guidance on approach to institutional controls. State staff should contact their agency legal office.
131.	Land use controls	California Health & Safety Code §25221	Voluntary agreements for land use restrictions	Relevant and appropriate		<p>Joint comments: Potential ARAR for the scope of land use controls described in the ROD that would apply to a nonfederal transferee of a site that does not allow</p>	As part of the transfer of land that does not allow for unrestricted use, AF requires a nonfederal transferee to execute an appropriate land use covenant under 22

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						for unrestricted use.	CCR § 67391.1 with the state as part of the transfer process. AF staff should contact AFLOA / JACE-FSC for the latest guidance on approach to institutional controls. State staff should contact their agency legal office.
132.	Land use controls	California Health & Safety Code §25355.5(a)(1)(C)	Enforceable agreements with responsible parties requiring land use covenants	Relevant and appropriate		Joint comments: Potential ARAR for the scope of land use controls described in the ROD that would apply to a nonfederal transferee of a site that does not allow for unrestricted use.	AF staff should contact AFLOA / JACE-FSC for the latest guidance on approach to institutional controls. State staff should contact their agency legal office.
133.	Waste Management Unit Closure	27 CCR 20080(d) 23 CCR 2510(d)	Requires that existing waste management units be closed according to the requirements of Title 27/Title 23.	Applicable	Applicable to existing onsite waste disposal units (e.g., disposal pits).	Joint comments: These regulations are potential ARARS, depending upon the particular site. AF takes exception to the administrative provisions, as discussed below: AF comments: The reporting requirements and approval by RWQCB of monitoring plan, are administrative	State should identify specific regulations that apply to closure. If clean closure is proposed, state and AF should determine cleanup level based on other ARARs and risk considerations. AF investigates sites under the CERCLA process. AF prepares reports of the nature and extent of releases in

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						requirements and thus not ARARs.	preliminary assessment / site inspection (PA/SI) reports and remedial investigation (RI) reports. AF will provide these reports to the state.
134.	LDR (Federal other related requirement)	40 CFR 264.554	During corrective action, remediation waste can be placed in piles without triggering LDRs or MTRs. Must not operate piles for more than 2 years and must be designated by appropriate agencies.	Applicable	This provision would allow for temporary storage of remediation wastes characterized as hazardous before and/or after treatment.	<p>Joint comments: Substantive portions are a potential ARAR for staging piles of hazardous remediation waste.</p> <p>AF comments: Administrative portions probably are not ARARs, such as provisions for submission of information, certifications, reports or other materials to DTSC or approval by DTSC. CERCLA does not require permits or permit applications for actions conducted entirely on-site.</p>	

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
135.	Minimum Standards for Health and Ecological Risk Assessments	California Health & Safety Code §25356.1.5(b)	Risk assessments for remedy selection must not only meet NCP requirements, but also must also include most current sound scientific methods, knowledge and practices of public health and environmental professionals	Relevant and Appropriate		<p>AF comments: This regulation is not a potential ARAR because it is procedural. It deals with the process of determining protectiveness under CERCLA.</p> <p>This regulation also applies only to sites considered listed under Health and Safety Code §25356. AF sites are not likely to be listed under that statute.</p> <p>AF conducts risk assessments and evaluates the need for action under the procedures of CERCLA, the NCP and EPA guidance. The RI work plan and RI report address the baseline risk assessment. AF provides these documents to the state.</p> <p>At AF sites not listed on the NPL, additional state requirements regarding</p>	AF staff should contact AFLOA / JACE-FSC for the latest guidance on approach to risk assessment. State staff should contact their agency legal office.

Potential ARARs for Hazardous Waste Management

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						<p>risk assessment may apply pursuant to CERCLA Section 120(a)(4), 42 USC Section 9620(a)(4). AF staff should consult with AFLOA / JACE-FSC for guidance on this point.</p> <p>State comments: State believes this provision is an ARAR in its entirety.</p>	

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Water Board Potential ARARs for Ground Water Remediation State of California

This Table sets forth state potential applicable or relevant and appropriate requirements (ARARs) and potential "to-be-considered" (TBCs) guidance that address remediation of hazardous substances in groundwater and surface water. These potential ARARs and TBCs are typically implemented by the California Regional Water Quality Control Boards (Water Boards). The Table includes the statutory source of the potential ARARs, the citation to the potential ARAR or TBC, the status of the potential ARARs, a description of the potential ARAR or TBC, and comments to assist in implementing the potential ARAR or TBC.

The State and the Air Force have developed similar tables for six groups of State provisions: DTSC (hazardous waste management), Water Boards (groundwater remediation, soil/sediment remediation), Water Boards / CalRecycle (non-hazardous and hazardous waste land disposal), Department of Fish and Wildlife (fish, wildlife, plants), Air Quality and Department of Public Health (radiological material). Users should refer to all six tables, as appropriate for the specific site.

In order for a State standard to be considered as an ARAR for a particular site, the State must identify the provision to the Air Force as a potential ARAR for the specific site in a timely manner. The provision will then be evaluated on a site specific basis. The purpose of the Air Force and State comments in the chart below is to describe the likely perspective of the Air Force and the State resulting from those site-specific reviews for future reference by Air Force and State staff. This chart should not be considered to be an Air Force or State commitment to any particular ARAR determination for any particular site.

This table does not reflect the perspective of federal agencies other than the Air Force. ARARs are determined on a site-specific basis. The characteristics of a particular site, and the views of other federal agencies, may lead to different conclusions about whether a particular provision is a potential ARAR for a site.

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
1	Porter-Cologne Water Quality Control Act (California Water Code Section 13000 et seq); California Water Code Section 13243	Discharge prohibitions in basin plans	Basin plan and site-specific permit prohibitions can protect specific water bodies or establish chemical-specific limits for discharges. As appropriate, the State may identify these prohibitions as location-specific ARARs or chemical-specific ARARs.	Applicable	Applies to groundwater remedial action.	<p>Joint comments: Staff should review basin plan for prohibitions pertinent to the specific water body receiving the discharge from the site or to substances within the specific discharge.</p> <p>The State is a support agency to AF at California restoration sites. As a result, the State has input into the remedial approach.</p>	Prohibitions may be set forth in the Basin Plan or could be included in WDRs, if issued. The Water Board staff should identify whether there is a prohibition in the Basin Plan that fits the circumstances of the remedy and provide that information to the AF. Where a prohibition would be in WDRs if issued, the Water Board staff should explain to the AF how that prohibition would be implemented in

Potential ARARs for Ground Water Remediation

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						<p>AF comments: Prohibitions would be evaluated against the standards applicable to ARAR determinations. AF would consider whether the provision is related to beneficial use; is risk-based; and is chemical-specific or location-specific.</p> <p>State comments: The State will determine if there is an applicable prohibition in the applicable Basin Plan and include that as an ARAR. Where the discharge would be normally subject to WDRs or an NPDES permit, the State will determine what prohibitions would be appropriate in the circumstances that would normally be included in a permit.</p>	<p>WDRs. For example, WDRs might prohibit discharge of treated effluent to certain locations, such as where the groundwater contains arsenic at high levels, not caused by the AF, but it could not be discharged to high quality water with respect to arsenic.</p>

Potential ARARs for Ground Water Remediation

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
2a	Porter-Cologne Water Quality Control Act (California Water Code Sections 13240, 13241, 13242, 13243)	Water Quality Control Plan (Basin Plan) for the [Insert Name of Regional Board][CITE PAGES WITH BENEFICIAL USES.]	Establishes beneficial uses for surface and ground waters in the region. [ADD LIST OF SPECIFIC BENEFICIAL USES FOR WATERS SUBJECT TO ROD.]	Applicable	Specific applicable portions of the Basin Plan include beneficial uses of affected water bodies.	<p>Joint comments: The beneficial use designations in the basin plan apply to restoration actions for purposes of determining cleanup level.</p> <p>AF comments: Beneficial use designation is not an ARAR, because does not set a numeric standard. AF accepts the beneficial use designations in the basin plan for purposes of determining cleanup level. AF reserves the right to challenge beneficial use designations as provided for by state law.</p> <p>State comments: The ROD should include a narrative description identifying the beneficial uses. The beneficial uses are the key to identifying numeric standards necessary to protect the uses. ARARs are defined in</p>	The parties do not agree on whether to describe beneficial use designations as ARARs. The AF agrees to identify in the decision document (e.g., ROD) the beneficial use designations from the Basin Plan and to use these designations in determining cleanup levels in the ROD. The AF accepts the beneficial use designations in the basin plan for purposes of determining cleanup level. To implement that agreement, the ARARs table should include a line item for beneficial uses, but would not be identified as ARARs, and the text of the decision document would identify the beneficial uses and the ARARs associated with those uses.

Potential ARARs for Ground Water Remediation

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						CERCLA as "standard, requirement, criteria, or limitation." It says nothing about "numeric standards." The State reserves the right to assure that all beneficial uses are protected as required by state and federal law.	
2b	Porter-Cologne Water Quality Control Act (California Water Code Sections 13240, 13241, 13242, 13243)	Water Quality Control Plan (Basin Plan) for the [Insert Name of Regional Board][CITE PAGES WITH WATER QUALITY OBJECTIVES.]	Establishes water quality objectives, including narrative and numerical standards that protect the beneficial uses and water quality objectives of surface and ground waters in the region. Describes implementation plans and other control measures designed to ensure compliance with statewide plans and policies. [ADD LIST OF SPECIFIC WATER QUALITY OBJECTIVES FOR WATERS SUBJECT TO ROD.]	Applicable	Specific applicable portions of the Basin Plan include beneficial uses of affected water bodies and water quality objectives to protect those uses. Any activity, including, but not limited to, the discharge of contaminated soils or waters or in-situ treatment or containment of contaminated soils or waters, must not result in actual water quality exceeding water quality objectives.	<p>Joint comments: Potential ARARs are water quality objectives (WQOs) for bacteria (2.2 organisms per 100 ml); chemical constituents based on State MCLs (if more stringent than Federal MCLs) lead (0.015 mg/l); and radionuclide MCLs.</p> <p>Baseline risk assessment will evaluate cumulative human health and ecological risk and assist in identifying needs for risk reduction.</p> <p>AF comments: The following are</p>	State and AF staff should identify the specific objective that addresses the constituents of concern, taking into account the range of possible remedial actions. The most stringent standard for any particular constituent is the controlling ARAR. For example, where there are both state and federal MCLs, the more stringent MCL would be the ARAR. Since the AF and the State do not agree on narrative and secondary MCLs, staff should seek legal advice to resolve

Potential ARARs for Ground Water Remediation

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						<p>probably not ARARs: WQOs for chemical constituents based on secondary MCLs if not risk-based; WQOs for taste, odor (not risk-based); narrative WQO for toxicity (vague and does not set a numerical standard). In evaluating other provisions, such as those regarding beneficial uses other than drinking water (MUN), AF would consider whether the provision is related to the beneficial use; is risk-based; is numeric; and is chemical-specific or location-specific.</p> <p>State comments: Narrative objectives are ARARs. How they are interpreted is addressed in the NCP and its preamble and also discussed in the EPA resolution of the Mather/George AFB dispute. With respect to taste and odor – although “secondary MCLs”</p>	<p>disagreements where those type of objectives are driving the cleanup. Often the baseline risk assessment or other considerations dispense with this issue.</p>

Potential ARARs for Ground Water Remediation

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						they are still ARARs because taste and odor can interfere with the use of water. For example, MTBE has a strong odor at very low concentrations, some pesticides impart strong taste, etc. There is nothing in CERCLA that says that state requirements are not ARARs if they are not risk-based.	
2c	Porter-Cologne Water Quality Control Act (California Water Code Sections 13240, 13241, 13242, 13243)	Narrative Toxicity Standard in the [Basin Plan]	Chapter III, Narrative Toxicity Objective, states as a policy that all waters shall be maintained free of toxic substances that produce detrimental physiological responses in human, plant, animal, or aquatic life.	Relevant and Appropriate (State believes this is an applicable requirement)	(Ref: McClellan GW ROD, August 2007)	<p>Joint comments: AF and state disagree on whether Narrative Toxicity Objective could be an ARAR.</p> <p>Baseline risk assessment will evaluate cumulative human health and ecological risk and assist in identifying needs for risk reduction.</p> <p>AF comments: Narrative Toxicity Objective is probably not ARAR. Vague and does not set a</p>	State and AF staff should identify the specific objective that addresses the constituents of concern, taking into account the range of possible remedial actions. Since the AF and the State do not agree on the ARAR status of the narrative toxicity objective, staff should seek legal advice to resolve disagreements where those type of objectives are driving the cleanup. Often the baseline risk

Potential ARARs for Ground Water Remediation

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						<p>numerical standard. In comparison, other portions of Chapter III establishing a numerical standard for hazardous substances, pollutants or contaminants above background, no lower than the MCLs, and are not standards applying to the aesthetic qualities of the water as opposed to risk based numerical standards, may be relevant and appropriate.</p> <p>State comments: Agree that practical impact not significant, but disagree that not an ARAR. The NCP clearly states that narrative standards are ARARs. Also see 40 CFR 122.44(d), which discusses implementation of narrative standards for discharges to surface water. The States are required to have a narrative toxicity objective for surface water in their</p>	assessment or other considerations dispense with this issue.

Potential ARARs for Ground Water Remediation

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						basin plans. If EPA can require for surface water, states can certainly adopt for groundwater under state sovereign authority. State ARARs are those standards that are more stringent than federal law, so if state adopts a narrative standard that is more stringent than federal law it can be an ARAR.	
3	Porter-Cologne Water Quality Control Act (California Water Code Sections 13000, 13304, 13240, 13241, 13242, 13243)	Central Valley Water Board Basin Plan, "Policy for Investigation and Cleanup of Contaminated Sites." [CHECK REGION'S BASIN PLAN FOR SIMILAR PROVISIONS AND REPLACE THIS LISTING.]	Establishes and describes policy for investigation and remediation of contaminated sites. Also includes implementation actions for setting groundwater and soil cleanup standard.	Applicable	<p>This Policy is a program for implementation of water quality objectives. Only applies in the Central Valley Region. Other Water Boards may have similar policies.</p> <p>Cleanup standards for water should be equal to background concentrations unless such levels are technically and economically infeasible to achieve. In such cases, cleanup standards</p>	<p>Joint comments: This policy is not an ARAR. The policy is primarily procedural and is consistent with the CERCLA process.</p> <p>AF follows a similar approach in the restoration program, as appropriate for the site, including:</p> <ul style="list-style-type: none"> • site investigation • source removal or containment • consultation with the state on cleanup levels • development of 	After identifying the specific water quality objective, the State staff should identify how this policy is used to implement the objective where appropriate. The policy is primarily procedural and very similar to the CERCLA process and is not likely to add anything beyond CERCLA.

Potential ARARs for Ground Water Remediation

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
					should not exceed applicable water quality objectives.	site specific cleanup levels <ul style="list-style-type: none"> • submission of technical studies and documentation • consideration of appropriate standards and factors in development of cleanup levels • verification sampling and follow up groundwater monitoring <p>AF comments: In addition, the provisions regarding cleanup to background levels or the lowest levels technically and economically feasible are not potential ARARs because not risk-based and not necessary to protect human health and the environment. The NCP requires clean-up levels to be protective and based on the identified risk to human health and the environment.</p>	

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						<p>State Comments. Disagree with the AF Comments. CERCLA requires cleanups to attain ARARs and to meet risk-based levels. Nothing in CERCLA says the risk-based levels are the limit. CERCLA requires that state ARARs are those that are more stringent than federal law without limitation as to risk. Thus, the requirement to cleanup to the extent technically and economically feasible is consistent with CERCLA.</p>	

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#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
4	Porter-Cologne Water Quality Control Act (California Water Code Sections 13240, 13241, 13242, 13243)	Central Valley Basin Plan, "Policy for Application of Water Quality Objectives" [CHECK REGION'S BASIN PLAN FOR SIMILAR POLICY AND REPLACE THIS LISTING.]	This policy defines water quality objectives and explains how the Regional Water Board applies numerical and narrative water quality objectives to ensure the reasonable protection of beneficial uses of water and how the Regional Water Board applies Resolution No. 68-16 to promote the maintenance of existing high-quality waters.	Applicable	Applies to groundwater remedial actions.	<p>Joint comments: AF and state disagree on whether this policy could be an ARAR.</p> <p>Item 2b above identifies the underlying WQOs that are and are not potential ARARs. Substantive requirements of NPDES program are potential ARARs. Baseline risk assessment will evaluate cumulative human health and ecological risk and assist in identifying needs for further risk reduction.</p> <p>AF comments: Policy is probably not an ARAR. Policy is found in Chapter 4 of CVR Basin Plan. Not applicable since it applies to the RWQCB and is therefore not of general applicability or enforceability. Not relevant and appropriate since it is administrative.</p>	After identifying the specific water quality objective, the State staff should identify how this policy is used to implement the objective where appropriate. In general, the risk assessment or other considerations address this issue.

Potential ARARs for Ground Water Remediation

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						<p>Procedural, not substantive.</p> <p>State comments: Disagree with reason – applying to the RB is not a reason to say that something is not an ARAR. If that were the case, nearly all federal laws would not be ARARs because they apply to EPA, or in the case of CERCLA to the President of the United States. The important point about this policy is that the NCP discusses interpretation of narrative standards and defers to the state's interpretation where it has a policy for implementation of narrative standards. Central Valley Region (Region 5) has such a policy.</p>	

Potential ARARs for Ground Water Remediation

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
5	Porter-Cologne Water Quality Control Act (California Water Code Sections 13140), ,	State Water Resources Control Board Resolution No. 2009-0011	Policy establishing criteria promoting use of recycled water and applies, among other activities, to actions that result in discharge of treated water.	Relevant and appropriate	Applies to groundwater extracted by groundwater treatment system.	<p>State comments: With respect to groundwater cleanup, this policy would be relevant and appropriate to actions resulting in discharges of treated water. The Air Force should consider sustainable options and prevent degradation of high quality waters.</p> <p>AF comments: The Recycled Water Policy is probably not an ARAR. The policy is not sufficiently specific or numeric and is not risk based. As part of remedy selection and remedial process optimization under the CERCLA process, AF evaluates options for reuse of treated groundwater.</p>	As part of remedy selection and remedial process optimization under the CERCLA process, the Air Force evaluates options for reuse of treated groundwater.

Potential ARARs for Ground Water Remediation

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
6	Porter-Cologne Water Quality Control Act (California Water Code Sections 13000, 13140, 13263, 13304)	State Water Resources Control Board Resolution No. 68-16 ("Anti-degradation Policy").	Requires that high quality surface and ground waters be maintained to the maximum extent possible. Degradation of waters will be allowed (or allowed to remain) only if it is consistent with the maximum benefit to the people of the state, does not unreasonably affect present and anticipated beneficial uses, and does not result in water quality less than that prescribed in RWQCB and SWRCB policies. If degradation is allowed, the discharge must meet best practicable treatment or control, which must prevent pollution or nuisance and result in the highest water quality consistent with maximum benefit to the people of the state.	Applicable	Applies to discharges of waste to waters, including discharges to soil that may affect surface or ground waters. In-situ cleanup levels for contaminated ground waters must be set at background level, unless allowing continued degradation is consistent with the maximum benefit of the people of the state. If degradation of waters is allowed, or allowed to remain, the discharge must meet best practical treatment or control standards, and result in the highest water quality possible that is consistent with the maximum benefit to the people of the state. In no case may water quality objectives be exceeded.	<p>Joint comments: Res. 68-16 is a potential ARAR for the reinjection or discharge of treated effluent into surface water or groundwater above background. This is based on an EPA decision resolving a dispute between AF and State at Mather/George AFBs. Res. 68-16 is not an ARAR for determining cleanup levels.</p> <p>Air Force and State disagree on whether Res. 68-16 is a potential ARAR for the treatment of ground water via injection of treatment media.</p> <p>AF comments: General AF position is Res. 68-16 is not an ARAR because it does not meet NCP criteria of enforceability and general applicability because directed to state agencies. It is</p>	<p>The State staff should provide information to the Air Force when identifying effluent limits for discharges of treated effluent to surface water or groundwater to assure compliance with Res. 68-16. The State should refer to Res. 92-49, rather than Res. 68-16, with respect to determining cleanup levels and containment for groundwater.</p> <p>Where the remedy involves treatment of ground water via injection of treatment media, staff should attempt to resolve any substantive issues and seek legal advice as needed.</p>

Potential ARARs for Ground Water Remediation

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						<p>also not relevant or appropriate because background level may be zero or a level not related to risk.</p> <p>AF also believes Res. 68-16 is not an ARAR for injection of treatment media to groundwater because treatment media is not a waste under Water Code §13050(d).</p> <p>State comments: Res. 68-16 is a promulgated standard that applies to discharges of waste to ground or surface water. It requires use of best practical treatment or control to achieve a level between background and the water quality standard. Res. 68-16 does apply to treatment via injection of treatment media. The injection can result in unintended consequences that</p>	

Potential ARARs for Ground Water Remediation

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						can increase concentrations of constituents or form new compounds. The RBs have adopted permits and other approvals of reinjection and found those to be generally consistent with Res. 68-16.	
7	Porter-Cologne Water Quality Control Act (California Water Code Sections 13000, 13140, 13240, 13260, 13263, 13267, 13300, 13304, 13307)	State Water Resources Control Board Resolution No. 92-49 (As amended April 21, 1994)	Establishes requirements for investigation and cleanup and abatement of discharges. Among other requirements, dischargers must clean up and abate the effects of discharges in a manner that promotes the attainment of either background water quality, or the best water quality that is reasonable if background water quality cannot be restored. Requires the application of Title 23, CCR, Section 2550.4, requirements to cleanups.	Applicable	Applies to groundwater remedial actions.	Joint comments: Air Force and State disagree on whether Res. 92-49 is a potential ARAR. As a practical matter, AF and State have been able to reach agreement on cleanup levels at specific sites. Although AF believes it is not required to do so, AF has conducted TEFA's to demonstrate that achievement of background levels is	AF and state staff should identify scope and parameters for purposes of TEFA at the RI stage if possible. The Air Force and State have been able to reach agreement on cleanup levels at specific sites. Although not required to do so, Air Force has conducted technical and economic feasibility studies to

Potential ARARs for Ground Water Remediation

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						<p>infeasible. TEFAs may be conducted as a part of the Feasibility Study if appropriate. Another option is to designate an interim cleanup level (such as the MCL) in the Record of Decision and conduct a TEFA after that interim cleanup level is achieved.</p> <p>AF comments: Insofar as 92-49 establishes a process for the RWQCB to follow, it is not applicable to AF. CERCLA and the NCP require that clean-up levels are to be protective, based on the identified risk to human health and the environment. Background levels are not risk based or necessary to protect human health and the environment. Investigation requirements are pre-remedy and therefore are not ARARs because ARARs specify clean up levels and standards</p>	demonstrate that achievement of background levels is infeasible.

Potential ARARs for Ground Water Remediation

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						<p>of control a remedy must attain not the investigation of a site. AF conducts site investigations in accordance with the CERCLA process.</p> <p>State comments: Disagree with the AF Comments. CERCLA requires cleanups to attain ARARs and to meet risk-based levels. Nothing in CERCLA says the risk-based levels are the limit. CERCLA requires that state ARARs are those that are more stringent than federal law without limitation as to risk. Thus, the requirement to cleanup to the extent technically and economically feasible is consistent with CERCLA. In addition, Res. 92-49 has language nearly identical to federal regulations that are also ARARs for groundwater cleanups.</p>	

Potential ARARs for Ground Water Remediation

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
7a	Porter-Cologne Water Quality Control Act (California Water Code Sections 13000, 13140, 13240, 13260, 13263, 13267, 13300, 13304, 13307)	State Water Resources Control Board Resolution 92-49, Section III.G	Section III.G of this Resolution states in part that dischargers are required to clean up and abate the effects of discharges in a manner that promotes attainment of background water quality, or the best water quality which is reasonable if background levels cannot be restored.	Applicable	Remedial alternatives evaluated must consider attainment of the highest water quality that is economically and technically achievable and protects beneficial uses. Used to establish soil cleanup levels protective of groundwater and surface water.	Joint comments: See comments above under Res. 92-49.	See above row.
8	Porter-Cologne Water Quality Control Act (California Water Code Sections 13000, 13140, 13240)	State Water Resources Control Board Resolution No. 88-63 ("Sources of Drinking Water Policy") (as contained in the RWQCB's Water Quality Control Plan)	Specifies that, with certain exceptions, all ground and surface waters must have the beneficial use of municipal or domestic water supply.	Applicable	Applies in determining beneficial uses for waters that may be affected by discharges of waste.	Joint comments: The beneficial use designations in the basin plan apply to restoration actions for purposes of determining cleanup level. AF comments: Res. 88-63 is not an applicable requirement because it applies only to RWQCBs. Nor is it relevant or appropriate in that is procedural and does not establish substantive requirements for	The parties do not agree on whether to describe beneficial use designations as ARARs. The AF agrees to identify in the decision document (e.g., ROD) the beneficial use designations from the Basin Plan and to use these designations in determining cleanup levels in the ROD. The Table will include a line item for beneficial uses, but they would not be identified as ARARs.

Potential ARARs for Ground Water Remediation

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						<p>remediation. AF accepts the beneficial use designations in the basin plan for purposes of determining cleanup level. AF reserves the right to challenge beneficial use designations as provided for by state law.</p> <p>State comments: Disagree with AF's legal premise. Many federal requirements, such as the Clean Water Act and its regulations, require EPA to include provisions in permits and yet federal NPDES requirements are considered applicable. The determination of the beneficial uses of waters of the state is a standard and, therefore, is a potential ARAR.</p> <p>To address this issue, the ROD or other decision document should identify the beneficial</p>	

Potential ARARs for Ground Water Remediation

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						uses in the narrative portion of the document, and make clear that the beneficial uses form the basis for identifying the water quality standards.	
9	Porter-Cologne Water Quality Control Act (California Water Code Sections 13140-13147, 13172, 13260, 13263, 13267, 13304)	Title 27, CCR, Division 2, Subdivision 1 (Section 20080 et seq.) Title 23, CCR, Division 3, Chapter 15 (Section 2510 et seq.) Title 22, CCR, Division 4.5, (Section 66250 et seq.)	Establishes waste and siting classification systems and minimum waste management standards for discharges of waste to land for treatment, storage, and disposal. Engineered alternatives that are consistent with Title 27/Title 23 performance goals may be considered. Establishes corrective action requirements for responding to discharges to land, including spills and leaks and other unauthorized discharges.	Applicable	The application of specific sections of Title 27/ Title 23 is discussed below. Provisions of Title 23 apply to hazardous waste and provisions of Title 27 apply to designated and nonhazardous solid waste.	Joint comments: State must identify specific regulations to address each action or site for ARAR consideration. AF complies with regulatory requirements and good engineering practices in management of waste left in place and in the handling and disposal of waste generated during remediation. AF comments: As a general matter, provisions addressing non-hazardous waste are not ARARs as non-hazardous waste is not a CERCLA hazardous substance. In specific situations,	State should identify specific regulations that apply to proposed action.

Potential ARARs for Ground Water Remediation

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						<p>non-hazardous waste can be a CERCLA pollutant or contaminant.</p> <p>State comments: Title 27 applies to designated waste and non-hazardous waste. In many cases, designated waste as defined in the Water Code are also hazardous substances. Title 23 applies to hazardous wastes, which are generally also hazardous substances. Facilities subject to Title 27, such as domestic landfills, often include hazardous substances.</p>	
10a	Porter-Cologne Water Quality Control Act (California Water Code Sections 13140-13147, 13172,	Title 27, CCR, Section 20090(d) Title 23, CCR, Section 2511 (d)	Actions taken by public agencies to clean up unauthorized releases are generally exempt from Title 27/ Title 23. One exception is that wastes removed from immediate place of release and discharged to land must be managed in accordance with	Applicable	Applies to remediation and monitoring of sites.	<p>Joint comments: The general exemption to Title 27 / Title 23 applies to actions taken by or under the direction of the AF. For wastes removed from the immediate place of release and discharged to land,</p>	If this provision is determined to be an ARAR for a particular site, AF and State staff should discuss procedures and location for deposit of excavated material.

Potential ARARs for Ground Water Remediation

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
	13260, 13263, 13267, 13304).		classification (Title 27, CCR, Section 20200/ Title 23, CCR, Section 2520) and siting requirements of Title 27 or Title 23.			<p>State must identify specific classification or siting provisions of Title 27 / Title 23 to address each action or site for ARAR consideration.</p> <p>Classification is part of the CERLA investigative process. Remediation under CERCLA is a substitute for corrective action. AF complies with regulatory requirements and good engineering practices in the handling and disposal of waste generated during remediation.</p> <p>State comments: Where the remedy is to remove waste from place of release and discharge to another location, the ROD should assure that the waste is properly classified and disposed to a waste unit consistent with its classification. Classification often occurs during the performance of the</p>	

Potential ARARs for Ground Water Remediation

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						remedy. The investigation is often more general, but the remedy specifics are developed during implementation of the ROD and, therefore, ARARs must be identified in the ROD.	
10b	Porter-Cologne Water Quality Control Act (California Water Code Sections 13140-13147, 13172, 13260, 13263, 13267, 13304).	Title 27, CCR, Section 20090(d) Title 23, CCR, Section 2511 (d)	Actions taken by public agencies to clean up unauthorized releases are generally exempt from Title 27/ Title 23. One exception is that wastes contained or left in place must comply with Title 27 or Title 23 to the extent feasible.	Applicable	Applies to remediation and monitoring of sites.	<p>Joint comments: The general exemption to Title 27 / Title 23 applies to actions taken by or under the direction of the AF. For wastes contained or left in place, State must identify specific provisions of Title 27 / Title 23 to address each action or site for ARAR consideration. Some provisions may be feasible, some may not.</p> <p>Remediation under CERCLA is a substitute for corrective action. AF complies with regulatory requirements and good engineering</p>	State should identify the specific "feasible" regulations that address the proposed action

Potential ARARs for Ground Water Remediation

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						practices in management of waste left in place.	
11	Porter-Cologne Water Quality Control Act (California Water Code Sections 13140-13147, 13172, 13260, 13263, 13267, 13304).	Title 27, CCR, Section 20400 Title 23, CCR, Section 2550.4.	Concentration limits must be established for groundwater, surface water, and the unsaturated zone. Must be based on background, equal to background, or for corrective actions, may be greater than background, not to exceed the lower of the applicable water quality objective or the concentration technologically or economically achievable. Specific factors must be considered in setting cleanup standards above background levels.	Applicable	Applies in setting ground water cleanup levels for all discharges of waste to land.	Joint comments: Air Force and State disagree on whether these regulations are potential ARARs. As a practical matter, AF and State have been able to reach agreement on cleanup levels at specific sites. Although AF believes it is not required to do so, AF has conducted TEFAs to demonstrate that achievement of background levels is infeasible. TEFAs may be conducted as a part of the Feasibility Study if appropriate. Another option is to designate an interim cleanup level (such as the MCL) in the Record of Decision and	If TEFA is appropriate, Air Force and State staff should work together to assure that the RI and FS develops sufficient information to conduct a TEFA.

Potential ARARs for Ground Water Remediation

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						<p>conduct a TEFA after that interim cleanup level is achieved.</p> <p>AF comments: These regulations are probably not potential ARARs. Provisions allowing RWQCB to reject proposed concentration limits greater than background with no consideration of risk or protectiveness unless it determines that background is technologically or economically infeasible are not ARARs. Other provisions allowing for MCLs may be ARARs.</p> <p>State comments: These provisions are included as part of the analysis under Res. 92-49 and federal RCRA regulations. See discussion above under Res. 92-49.</p>	

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12	Porter-Cologne Water Quality Control Act (California Water Code Sections 13140-13147, 13172, 13260, 13263, 13267, 13304).	Title 27, CCR, Section 20410 Title 23, CCR, Section 2550.6	Requires monitoring for compliance with remedial action objectives for three years from the date of achieving cleanup standards.	Applicable	Applies to groundwater remedial actions.	<p>Joint comments: These monitoring regulations are potential ARARs, except for reporting provisions. Reporting provisions are considered procedural and thus not eligible to be ARARs. Reporting is generally taken care of in the CERCLA process.</p> <p>AF includes these monitoring results in regular monitoring reports prepared under the CERCLA program, which can include Base-Wide Groundwater Monitoring Reports. AF will provide these monitoring reports to State.</p>	The AF and state staff should work together to identify appropriate monitoring parameters and frequencies. Although reporting provisions are generally not an ARAR, the CERCLA process provides for development of appropriate technical reports to provide the results of monitoring programs.

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13	Porter-Cologne Water Quality Control Act (California Water Code Sections 13140-13147, 13172, 13260, 13263, 13267, 13304).	Title 27, CCR, Section 20415 Title 23, CCR, Section 2550.7.	Requires general soil, surface water, and ground water monitoring.	Applicable	Applies to all areas at which waste has been discharged to land.	<p>Joint comments: The portions of these regulations regarding the Detection Monitoring Program (DMP) and Corrective Action Program (CAP) are potential ARARs, except for the reporting and record-keeping provisions.</p> <p>Reporting and record-keeping provisions are considered procedural and thus not eligible to be ARARs. Reporting and record-keeping are generally taken care of in the CERCLA process.</p> <p>The portions of these regulations regarding the Evaluation Monitoring Program (EMP) generally are not a potential ARAR. The EMP is investigatory, designed to determine nature and extent of release from waste management unit.</p>	The AF and state staff should work together to identify the appropriate monitoring parameters and frequencies to comply with the detection and corrective action monitoring requirements.

Potential ARARs for Ground Water Remediation

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						<p>ARARs apply only to remedial actions, not to investigations. AF includes these monitoring results in regular monitoring reports prepared under the CERCLA program, which can include Base-Wide Groundwater Monitoring Reports. AF will provide these monitoring reports to State. If an investigation is needed because of a release, the AF will prepare an investigation report under the CERCLA program and provide to the State.</p> <p>State comments: Evaluation monitoring generally will have occurred in the investigation phase, but to the extent additional evaluation monitoring is required during the implementation of the remedy it should be identified as an ARAR.</p>	

Potential ARARs for Ground Water Remediation

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
14	Porter-Cologne Water Quality Control Act (California Water Code Sections 13140-13147, 13172, 13260, 13263, 13267, 13304).	Title, 27, CCR, Section 20425 Title, 23, CCR, Section 2550.9.	Requires an assessment of the nature and extent of the release, including a determination of the spatial distribution and concentration of each constituent.	Applicable	Applies to areas at which monitoring results show statistically significant evidence of a release.	<p>Joint comments: These regulations generally are not potential ARARs. These regulations provide requirements for the Evaluation Monitoring Program (EMP). The EMP is investigatory, designed to determine nature and extent of release from waste management unit. ARARs apply only to remedial actions, not to investigations.</p> <p>If an investigation is needed because of a release, the AF will prepare an investigation report under the CERCLA program and provide to the State.</p> <p>State comments: Evaluation monitoring generally will have occurred in the investigation phase, but to the extent additional evaluation monitoring is required during the implementation of the</p>	AF and state staff should work together to assure that the investigation adequately assesses the nature and extent of the release to assure compliance with ARARs for the remedy.

Potential ARARs for Ground Water Remediation

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						remedy it should be identified as an ARAR.	
15	Porter-Cologne Water Quality Control Act (California Water Code Sections 13140-13147, 13172, 13260, 13263, 13267, 13304).	Title 27, CCR, Section 20430 Title 23, CCR Section 2550.10	Requires implementation of corrective action measures that ensure that cleanup levels are achieved throughout the zone affected by the release by removing the waste constituents or treating them in place. Source control may be required. Also requires monitoring to determine the effectiveness of the corrective actions.	Applicable	Applies to groundwater remedial actions.	<p>Joint comments: This regulation is a potential ARAR, except for reporting provisions. AF takes additional exception, as described below.</p> <p>Possibly premature to designate as ARAR in ROD, because provides standards for a corrective action program when there is a release from a waste management unit.</p> <p>AF includes results of corrective action measures in reports prepared under CERCLA program, which are provided to the State.</p> <p>AF comments: The portions of these regulations allowing State to set water standards to background and</p>	The AF and state staff should determine actions and monitoring to assure that remedy achieves cleanup levels throughout the zone affected by the releases. AF will include results of corrective action measures in reports prepared under restoration program, which are provided to the State.

Potential ARARs for Ground Water Remediation

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						<p>without regard to risk are not an ARAR. Cleanup to background is not an ARAR.</p> <p>State comments: Disagree with AF analysis. State ARARs are those standards that are more stringent than federal law regardless of risk. Cleanup to background is set forth in several state ARARs. As a practical matter, often not feasible to cleanup to background and less stringent level that meets water quality standards is often appropriate.</p>	

Potential ARARs for Ground Water Remediation

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16							
17	California Safe Drinking Water Act (California Health & Safety Code Section 4010 et seq.)	Title 22, CCR, Section 64400 et seq.	Requirements for public water systems. Includes Maximum Contaminant Levels (MCLs) and Secondary Maximum Contaminant Levels (SMCLs). State MCLs which are more stringent than the federal MCLs, or not addressed by federal MCLs are [LIST SPECIFIC CONSTITUENTS, e.g., BENZENE.]	Applicable	The act is legally applicable for an aquifer and associated distribution and pre-treatment system that is currently defined as "public water system" If it is only a potential "Public water system," then the act is relevant and appropriate.	<p>Joint comments: State MCLs, currently in 22 CCR §§64431 and 64444 are potential ARARs. Groundwater must be current or potential drinking water source. State MCL must be more stringent than Federal MCL.</p> <p>If State MCL is same as Federal MCL, the same level of control will apply.</p> <p>Contaminants above secondary MCLs may pose a taste or odor concern, but will not pose a health</p>	State staff should identify state MCLs that are in addition to, or more stringent than, federal MCLs. Applies where groundwater is source of drinking water. Where a secondary MCL could be the driving standard for a cleanup, State staff should seek legal advice to resolve any issues.

Potential ARARs for Ground Water Remediation

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						risk. AF comments: Secondary MCLs are not ARARs because they are not risk based. Secondary MCLs are not designed to address unacceptable risk to human health or the environment (EPA OSWER Document No. 9285.7-48).	
18	Staff Report of the Central Valley Water Board	"A Compilation of Water Quality Goals"	Provides guidance on selecting numerical values to implement narrative water quality objectives contained in the Basin Plan.	To Be Considered	Performance Standard. To be considered in selecting appropriate numerical values to implement the Basin Plan for setting cleanup levels and discharge limits. The numerical values contained in the staff report may be ARARs, or Performance Standards, depending on the source of the values.	Joint comments: State would need to identify specific provisions for evaluation as potential ARARs or to be considered items.	This Report is a reference document that lists both promulgated standards, such as water quality objectives, and non-promulgated numeric values. The state should identify whether any listed value addresses the site specific conditions and potential remedies. If there is a question on how to use this document, seek advice from Water Board counsel.

Potential ARARs for Ground Water Remediation

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19		California Toxics Rule 40 CFR Part 131	Water Quality Standards: The California Toxics Rule establishes permit limits for new or revised NPDES permits when certain conditions are met. Applies to the discharge of treated groundwater to surface water.	Applicable	This establishes criteria for surface water quality; therefore, it is applicable to discharge of treated groundwater. (Ref: McClellan GW ROD, August 2007)	Joint comments: This regulation establishes chemical-specific numeric standards for surface water quality. This regulation is a potential ARAR for discharges of treated groundwater to surface water such as creek or pond. California standards are found in 40 CFR 131.37, 131.38. AF comments: The State will need to identify the specific provisions of this regulation that the State believes are substantive and apply to the particular site as a potential federal ARAR.	State staff should identify as an ARAR, the CTR criteria that fit the circumstances of the site, including discharges of treated ground water to surface waters and runoff from site that could reach surface waters.
20	Water Code Division 7, Chapter 5.5	NPDES regulations	The State implements the federal NPDES requirements in lieu of EPA in most situations.	Applicable	These standards apply when discharging waste to surface waters of the U.S. May also include regular individual point source requirements and industrial, construction, and municipal stormwater requirements.	Joint comments: Substantive portions of these regulations are potential ARARs, such as discharge limits and monitoring. Procedural requirements, such as reporting and record-keeping, are not potential ARARs.	State staff should identify substantive NPDES requirements that would apply to discharges to surface waters as ARARs. Monitoring reports are not ARARs, but monitoring requirements are. Air Force will include monitoring results in

Potential ARARs for Ground Water Remediation

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						<p>AF includes these monitoring results in regular monitoring reports prepared under the CERCLA program. AF will provide these monitoring reports to State.</p> <p>AF comments: The State will need to identify the specific provisions of these regulations that the State believes are substantive and apply to the particular site as a potential ARAR. To the extent the state provisions incorporate and are identical to federal provisions, the state provisions would not be more stringent and thus would not be potential ARARs.</p>	CERCLA documents required by RODs and agreements that are provided to the State.
21	Water Code Section 13263	Central Valley Region Order No. R5-2008-0149 (Waste Discharge Requirements – General Order for In-Situ Groundwater Remediation	This order regulates the use and application of in-situ biological, chemical and physical treatments to clean up waste constituents in groundwater.	Applicable		<p>AF comments: The substantive portions of this general order for waste discharge requirements, including the monitoring provisions, are</p>	AF will consult with the state in developing its approach to in-situ remediation and will provide the state with the opportunity to comment on work plans. AF will include

Potential ARARs for Ground Water Remediation

#	Source	Standard, Requirement, Criterion, or Limitation	Description	State's View on ARARs, or To Be Considered	Comments	AF and State Comments	Implementation
						<p>potential ARARs for the in-situ remediation of the specified contaminants, when the specified materials are applied to the site.</p> <p>Procedural and administrative portions are not potential ARARs, including approvals by the regional board; reporting requirements, such as notices, notifications, plans, data submissions and technical reports; record-keeping requirements; and the payment of fees.</p>	<p>monitoring results in regular monitoring reports prepared under the CERCLA program. AF will provide these monitoring reports to State.</p>

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Colorado River Basin Regional Water Quality Control Board

April 8, 2020

Si T. Le, P.E.
Environmental Restoration Business Line Team Lead
937 North Harbor Drive, 3rd Floor
San Diego, CA 92132
By Direction of the Commanding Officer

SUBJECT: IDENTIFICATION OF STATE APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs) FOR THE NON-TIME CRITICAL REMOVAL ACTION AT MUNITIONS RESPONSE PROGRAM (MRP) SITE 2

SITE: NAVAL AIR FACILITY EL CENTRO, IMPERIAL COUNTY

Dear Mr. Le,

As requested by the Department of the Navy (Navy), in a letter dated January 9, 2020, the California Regional Water Quality Control Board, Colorado River Basin Region (Regional Water Board) is providing Applicable or Relevant and Appropriate Requirements (ARARs) for Munitions Response Program (MRP) Site 2, Naval Air Facility El Centro, California (Attachment).

Regional Water Board appreciates the Navy's time and efforts addressing environmental issues at MRP Site 2 and looks forward to continuing to assist the Navy with environmental issues at contaminated sites within Naval Air Facility El Centro.

If you have questions or comments, please contact Jessie Bagby at (760) 776-8972 or by email Jessica.bagby@waterboards.ca.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Joan Stormo".

Joan Stormo, PG, CHG
Senior Engineering Geologist
Colorado River Basin
Regional Water Quality Control Board

Attachment A: CRWQCB, Colorado Basin Region Groundwater Remediation
ARARs for Non-Time Critical Removal Action at MRP Site 2 at Naval
Air Facility El Centro

Attachment B: CRWQCB, Colorado Basin Region Soil/Sediment Remediation
ARARs for Non-Time Critical Removal Action at MRP Site 2 at Naval
Air Facility El Centro

cc: Via Email:
Irena Edwards, DTSC, irena.edwards@dtsc.ca.gov
Amy Tong, NAVFAC Southwest, amy.tong1@navy.mil

File: T10000011417, NAF El Centro, MRP Site 2

Attachment A: CRWQCB, Colorado Basin Region Groundwater Remediation ARARs for Non-Time Critical Removal Action at MRP Site 2 at Naval Air Facility El Centro

#	Source	Standard, Requirement, Criterion, or Limitation	Description	Comments
1	Porter-Cologne Water Quality Control Act (California Water Code Sections: - 13000 et seq. [Repealed and added by Stats. 1969, Ch. 482.] - 13243 [Added by Stats. 1969, Ch. 482.]	Discharge prohibitions in basin plans	Basin plan and site-specific permit prohibitions can protect specific water bodies or establish chemical-specific limits for discharges. As appropriate, the State may identify these prohibitions as location-specific ARARs or chemical-specific ARARs.	Applies to groundwater remedial action.
2	Porter-Cologne Water Quality Control Act (California Water Code Sections: - 13240 [Added by Stats. 1969, Ch. 482] - 13241 [Amended by Stats. 1991, Ch. 187, Sec. 2.], - 13242 [Added by Stats. 1969, Ch. 482.] - 13243 [Added by Stats. 1969, Ch. 482.]	Water Quality Control Plan (Basin Plan) for the Colorado Basin Region. Chapter 2: Beneficial Uses, pages 2-1 through 2-18. (Includes amendments effective on or before January 8, 2019)	Establishes beneficial uses for surface and ground waters in the region.	Specific applicable portions of the Basin Plan include beneficial uses of affected water bodies. NAF El Centro is located over the Imperial Hydrologic Unit. The Basin Plan defines beneficial uses for groundwater beneath NAF El Centro as Municipal and Domestic Supply (MUN) and Industrial Service Supply (IND).
3	Porter-Cologne Water Quality Control Act (California Water Code Sections: - 13240 [Added by Stats. 1969, Ch. 482] - 13241 [Amended by Stats. 1991, Ch. 187, Sec. 2.], - 13242 [Added by Stats. 1969, Ch. 482.] - 13243 [Added by Stats. 1969, Ch. 482.]	Water Quality Control Plan (Basin Plan) for the Colorado Basin Region. Chapter 3: Water Quality Objectives, pages 3-1 through 3-11. (Includes amendments effective on or before January 8, 2019)	Establishes water quality objectives, including narrative and numerical standards that protect the beneficial uses and water quality objectives of surface and ground waters in the region. Describes implementation plans and other control measures designed to ensure compliance with statewide plans and policies.	Specific applicable portions of the Basin Plan include beneficial uses of affected water bodies and water quality objectives to protect those uses. Any activity, including, but not limited to, the discharge of contaminated soils or waters or in-situ treatment or containment of contaminated soils or waters, must not result in actual water quality exceeding water quality objectives.
4	Porter-Cologne Water Quality Control Act (California Water Code Sections: - 13240 [Added by Stats. 1969, Ch. 482] - 13241 [Amended by Stats. 1991, Ch. 187, Sec. 2.], - 13242 [Added by Stats. 1969, Ch. 482.] - 13243 [Added by Stats. 1969, Ch. 482.]	Narrative Toxicity Standard in the Colorado River Basin Regional Basin Plan. (Includes amendments effective on or before January 8, 2019)	Chapter III, Narrative Toxicity Objective, states as a policy that all waters shall be maintained free of toxic substances that produce detrimental physiological responses in human, plant, animal, or aquatic life.	None

#	Source	Standard, Requirement, Criterion, or Limitation	Description	Comments
5	Porter-Cologne Water Quality Control Act (California Water Code Sections: - 13240 [Added by Stats. 1969, Ch. 482] - 13241 [Amended by Stats. 1991, Ch. 187, Sec. 2.], - 13242 [Added by Stats. 1969, Ch. 482.] - 13243 [Added by Stats. 1969, Ch. 482.]	Water Quality Control Plan (Basin Plan) for the Colorado Basin Region. Chapters 4-6, pages 4-1 through 6-13. (Includes amendments effective on or before January 8, 2019)	Explains how the Regional Water Board applies numerical and narrative water quality objectives to ensure the reasonable protection of beneficial uses of water and how the Regional Water Board applies Resolution No. 68-16 to promote the maintenance of existing high-quality waters.	Applies to groundwater remedial actions.
6	Porter-Cologne Water Quality Control Act (California Water Code Sections: - 13000 [Repealed and added by Stats. 1969, Ch. 482.] - 13140 [Added by Stats. 1969, Ch. 482.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13304 [Amended by Stats. 2014, Ch. 739, Sec. 1. (AB 2442) Effective January 1, 2015.]	State Water Resources Control Board Resolution No. 68-16 ("Anti-degradation Policy").	Requires that high quality surface and ground waters be maintained to the maximum extent possible. Degradation of waters will be allowed (or allowed to remain) only if it is consistent with the maximum benefit to the people of the state, does not unreasonably affect present and anticipated beneficial uses, and does not result in water quality less than that prescribed in RWQCB and SWRCB policies. If degradation is allowed, the discharge must meet best practicable treatment or control, which must prevent pollution or nuisance and result in the highest water quality consistent with maximum benefit to the people of the state.	Applies to discharges of waste to waters, including discharges to soil that may affect surface or ground waters. In-situ cleanup levels for contaminated ground waters must be set at background level, unless allowing continued degradation is consistent with the maximum benefit of the people of the state. If degradation of waters is allowed, or allowed to remain, the discharge must meet best practical treatment or control standards, and result in the highest water quality possible that is consistent with the maximum benefit to the people of the state. In no case may water quality objectives be exceeded.
7	Porter-Cologne Water Quality Control Act (California Water Code Sections: - 13000 [Repealed and added by Stats. 1969, Ch. 482.] - 13140 [Added by Stats. 1969, Ch. 482.] - 13240 [Added by Stats. 1969, Ch. 482] - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13267 [Amended by Stats. 2006, Ch. 293, Sec. 2. Effective January 1, 2007.]	State Water Resources Control Board Resolution No. 92-49 (As amended April 21, 1994)	Establishes requirements for investigation and cleanup and abatement of discharges. Among other requirements, dischargers must clean up and abate the effects of discharges in a manner that promotes the attainment of either background water quality, or the best water quality that is reasonable if background water quality cannot be restored. Requires the application of Title 23, CCR, Section 2550.4, requirements to cleanups.	Applies to groundwater remedial actions.

#	Source	Standard, Requirement, Criterion, or Limitation	Description	Comments
	<ul style="list-style-type: none"> - 13300 [Amended by Stats. 1971, Ch. 1288.] - 13304 [Amended by Stats. 2014, Ch. 739, Sec. 1. (AB 2442) Effective January 1, 2015.] - 13307 [Amended by Stats. 1993, Ch. 523, Sec. 2. Effective January 1, 1994.]) 			
8	Porter-Cologne Water Quality Control Act (California Water Code Sections: <ul style="list-style-type: none"> - 13000 [Repealed and added by Stats. 1969, Ch. 482.] - 13140 [Added by Stats. 1969, Ch. 482.] - 13240 [Added by Stats. 1969, Ch. 482] - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13267 [Amended by Stats. 2006, Ch. 293, Sec. 2. Effective January 1, 2007.] - 13300 [Amended by Stats. 1971, Ch. 1288.] - 13304 [Amended by Stats. 2014, Ch. 739, Sec. 1. (AB 2442) Effective January 1, 2015.] - 13307 [Amended by Stats. 1993, Ch. 523, Sec. 2. Effective January 1, 1994.]) 	State Water Resources Control Board Resolution 92-49, Section III.G	Section III.G of this Resolution states in part that dischargers are required to clean up and abate the effects of discharges in a manner that promotes attainment of background water quality, or the best water quality which is reasonable if background levels cannot be restored.	Remedial alternatives evaluated must consider attainment of the highest water quality that is economically and technically achievable and protects beneficial uses. Used to establish soil cleanup levels protective of groundwater and surface water.
9	Porter-Cologne Water Quality Control Act (California Water Code Sections: <ul style="list-style-type: none"> - 13000 [Repealed and added by Stats. 1969, Ch. 482.] - 13140 [Added by Stats. 1969, Ch. 482.] - 13240 [Added by Stats. 1969, Ch. 482.]) 	State Water Resources Control Board Resolution No. 88-63 ("Sources of Drinking Water Policy") (as contained in the Water Quality Control Plan [Basin Plan] for the Colorado River Basin Region)	Specifies that, with certain exceptions, all ground and surface waters must have the beneficial use of municipal or domestic water supply.	Applies in determining beneficial uses for waters that may be affected by discharges of waste.
10	Porter-Cologne Water Quality Control Act (California Water Code Sections: <ul style="list-style-type: none"> - 13140 [Added by Stats. 1969, Ch. 482.] 	- Title 27, CCR, Division 2, Subdivision 1	Establishes waste and siting classification systems and minimum waste management standards for	The application of specific sections of Title 27/ Title 23 is discussed below.

#	Source	Standard, Requirement, Criterion, or Limitation	Description	Comments
	<ul style="list-style-type: none"> - 13141 [Amended by Stats. 1976, Ch. 149.] - 13142 [Amended by Stats. 1995, Ch. 28, Sec. 18. Effective January 1, 1996.] - 13143 [Added by Stats. 1969, Ch. 482.] - 13144 [Added by Stats. 1969, Ch. 482.] - 13145 [Added by Stats. 1969, Ch. 482.] - 13146 [Added by Stats. 1969, Ch. 482.] - 13147 [Amended by Stats. 1971, Ch. 1288.] - 13172 [Amended by Stats. 1989, Ch. 642, Sec. 3.] - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13267 [Amended by Stats. 2006, Ch. 293, Sec. 2. Effective January 1, 2007.] - 13304 [Amended by Stats. 2014, Ch. 739, Sec. 1. (AB 2442) Effective January 1, 2015.] 	<ul style="list-style-type: none"> (Section 20080 et seq.) - Title 23, CCR, Division 3, Chapter 15 (Section 2510 et seq.). - Title 22, CCR, Division 4.5, (Section 66250 et seq.) 	discharges of waste to land for treatment, storage, and disposal. Engineered alternatives that are consistent with Title 27/Title 23 performance goals may be considered. Establishes corrective action requirements for responding to discharges to land, including spills and leaks and other unauthorized discharges.	Provisions of Title 23 apply to hazardous waste and provisions of Title 27 apply to designated and nonhazardous solid waste.
11	Porter-Cologne Water Quality Control Act (California Water Code Sections: <ul style="list-style-type: none"> - 13140 [Added by Stats. 1969, Ch. 482.] - 13141 [Amended by Stats. 1976, Ch. 149.] - 13142 [Amended by Stats. 1995, Ch. 28, Sec. 18. Effective January 1, 1996.] - 13143 [Added by Stats. 1969, Ch. 482.] - 13144 [Added by Stats. 1969, Ch. 482.] - 13145 [Added by Stats. 1969, Ch. 482.] - 13146 [Added by Stats. 1969, Ch. 482.] - 13147 [Amended by Stats. 1971, Ch. 1288.] - 13172 [Amended by Stats. 1989, Ch. 642, Sec. 3.] - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] 	<ul style="list-style-type: none"> - Title 27, CCR, Section 20090 (d) - Title 23, CCR. Section 2511 (d) 	Actions taken by public agencies to clean up unauthorized releases are generally exempt from Title 27/ Title 23. One exception is that wastes removed from immediate place of release and discharged to land must be managed in accordance with classification (Title 27, CCR, Section 20200/ Title 23, CCR, Section 2520) and siting requirements of Title 27 or Title 23.	Applies to remediation and monitoring of sites.

#	Source	Standard, Requirement, Criterion, or Limitation	Description	Comments
	<ul style="list-style-type: none"> - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13267 [Amended by Stats. 2006, Ch. 293, Sec. 2. Effective January 1, 2007.] - 13304 [Amended by Stats. 2014, Ch. 739, Sec. 1. (AB 2442) Effective January 1, 2015.]) 			
12	Porter-Cologne Water Quality Control Act (California Water Code Sections: <ul style="list-style-type: none"> - 13140 [Added by Stats. 1969, Ch. 482.] - 13141 [Amended by Stats. 1976, Ch. 149.] - 13142 [Amended by Stats. 1995, Ch. 28, Sec. 18. Effective January 1, 1996.] - 13143 [Added by Stats. 1969, Ch. 482.] - 13144 [Added by Stats. 1969, Ch. 482.] - 13145 [Added by Stats. 1969, Ch. 482.] - 13146 [Added by Stats. 1969, Ch. 482.] - 13147 [Amended by Stats. 1971, Ch. 1288.] - 13172 [Amended by Stats. 1989, Ch. 642, Sec. 3.] - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13267 [Amended by Stats. 2006, Ch. 293, Sec. 2. Effective January 1, 2007.] - 13304 [Amended by Stats. 2014, Ch. 739, Sec. 1. (AB 2442) Effective January 1, 2015.]) 	<ul style="list-style-type: none"> - Title 27, CCR, Section 20090 (d) - Title 23, CCR, Section 2511 (d) 	Actions taken by public agencies to clean up unauthorized releases are generally exempt from Title 27/ Title 23. One exception is that wastes contained or left in place must comply with Title 27 or Title 23 to the extent feasible.	Applies to remediation and monitoring of sites.
13	Porter-Cologne Water Quality Control Act (California Water Code Sections: <ul style="list-style-type: none"> - 13140 [Added by Stats. 1969, Ch. 482.] - 13141 [Amended by Stats. 1976, Ch. 149.] - 13142 [Amended by Stats. 1995, Ch. 28, Sec. 18. Effective January 1, 1996.] - 13143 [Added by Stats. 1969, Ch. 482.] 	<ul style="list-style-type: none"> - Title 27, CCR, Section 20400 - Title 23, CCR, Section 2550.4. 	Concentration limits must be established for groundwater, surface water, and the unsaturated zone. Must be based on background, equal to background, or for corrective actions, may be greater than background, not to exceed the lower of the applicable water quality objective or the	Applies in setting ground water cleanup levels for all discharges of waste to land.

#	Source	Standard, Requirement, Criterion, or Limitation	Description	Comments
	<ul style="list-style-type: none"> - 13144 [Added by Stats. 1969, Ch. 482.] - 13145 [Added by Stats. 1969, Ch. 482.] - 13146 [Added by Stats. 1969, Ch. 482.] - 13147 [Amended by Stats. 1971, Ch. 1288.] - 13172 [Amended by Stats. 1989, Ch. 642, Sec. 3.] - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13267 [Amended by Stats. 2006, Ch. 293, Sec. 2. Effective January 1, 2007.] - 13304 [Amended by Stats. 2014, Ch. 739, Sec. 1. (AB 2442) Effective January 1, 2015.]) 		concentration technologically or economically achievable. Specific factors must be considered in setting cleanup standards above background levels.	
14	Porter-Cologne Water Quality Control Act (California Water Code Sections: <ul style="list-style-type: none"> - 13140 [Added by Stats. 1969, Ch. 482.] - 13141 [Amended by Stats. 1976, Ch. 149.] - 13142 [Amended by Stats. 1995, Ch. 28, Sec. 18. Effective January 1, 1996.] - 13143 [Added by Stats. 1969, Ch. 482.] - 13144 [Added by Stats. 1969, Ch. 482.] - 13145 [Added by Stats. 1969, Ch. 482.] - 13146 [Added by Stats. 1969, Ch. 482.] - 13147 [Amended by Stats. 1971, Ch. 1288.] - 13172 [Amended by Stats. 1989, Ch. 642, Sec. 3.] - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13267 [Amended by Stats. 2006, Ch. 293, Sec. 2. Effective January 1, 2007.] 	<ul style="list-style-type: none"> - Title 27, CCR, Section 20410 - Title 23, CCR, Section 2550.6 	Requires monitoring for compliance with remedial action objectives for three years from the date of achieving cleanup standards.	Applies to groundwater remedial actions.

#	Source	Standard, Requirement, Criterion, or Limitation	Description	Comments
	- 13304 [Amended by Stats. 2014, Ch. 739, Sec. 1. (AB 2442) Effective January 1, 2015.])			
15	Porter-Cologne Water Quality Control Act (California Water Code Sections: - 13140 [Added by Stats. 1969, Ch. 482.] - 13141 [Amended by Stats. 1976, Ch. 149.] - 13142 [Amended by Stats. 1995, Ch. 28, Sec. 18. Effective January 1, 1996.] - 13143 [Added by Stats. 1969, Ch. 482.] - 13144 [Added by Stats. 1969, Ch. 482.] - 13145 [Added by Stats. 1969, Ch. 482.] - 13146 [Added by Stats. 1969, Ch. 482.] - 13147 [Amended by Stats. 1971, Ch. 1288.] - 13172 [Amended by Stats. 1989, Ch. 642, Sec. 3.] - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13267 [Amended by Stats. 2006, Ch. 293, Sec. 2. Effective January 1, 2007.] - 13304 [Amended by Stats. 2014, Ch. 739, Sec. 1. (AB 2442) Effective January 1, 2015.])	- Title 27, CCR, Section 20415 - Title 23, CCR, Section 2550.7.	Requires general soil, surface water, and ground water monitoring.	Applies to all areas at which waste has been discharged to land.
16	- Porter-Cologne Water Quality Control Act (California Water Code Sections: - 13140 [Added by Stats. 1969, Ch. 482.] - 13141 [Amended by Stats. 1976, Ch. 149.] - 13142 [Amended by Stats. 1995, Ch. 28, Sec. 18. Effective January 1, 1996.] - 13143 [Added by Stats. 1969, Ch. 482.] - 13144 [Added by Stats. 1969, Ch. 482.] - 13145 [Added by Stats. 1969, Ch. 482.] - 13146 [Added by Stats. 1969, Ch. 482.]	- Title, 27, CCR, Section 20425 - Title, 23, CCR, Section 2550.9.	Requires an assessment of the nature and extent of the release, including a determination of the spatial distribution and concentration of each constituent.	Applies to areas at which monitoring results show statistically significant evidence of a release.

#	Source	Standard, Requirement, Criterion, or Limitation	Description	Comments
	<ul style="list-style-type: none"> - 13147 [Amended by Stats. 1971, Ch. 1288.] - 13172 [Amended by Stats. 1989, Ch. 642, Sec. 3.] - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13267 [Amended by Stats. 2006, Ch. 293, Sec. 2. Effective January 1, 2007.] - 13304 [Amended by Stats. 2014, Ch. 739, Sec. 1. (AB 2442) Effective January 1, 2015.]) 			
17	Porter-Cologne Water Quality Control Act (California Water Code Sections <ul style="list-style-type: none"> - 13140 [Added by Stats. 1969, Ch. 482.] - 13141 [Amended by Stats. 1976, Ch. 149.] - 13142 [Amended by Stats. 1995, Ch. 28, Sec. 18. Effective January 1, 1996.] - 13143 [Added by Stats. 1969, Ch. 482.] - 13144 [Added by Stats. 1969, Ch. 482.] - 13145 [Added by Stats. 1969, Ch. 482.] - 13146 [Added by Stats. 1969, Ch. 482.] - 13147 [Amended by Stats. 1971, Ch. 1288.] - 13172 [Amended by Stats. 1989, Ch. 642, Sec. 3.] - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13267 [Amended by Stats. 2006, Ch. 293, Sec. 2. Effective January 1, 2007.] - 13304 [Amended by Stats. 2014, Ch. 739, Sec. 1. (AB 2442) Effective January 1, 2015.]) 	<ul style="list-style-type: none"> - Title 27, CCR, Section 20430 - Title 23, CCR Section 2550.10 	Requires implementation of corrective action measures that ensure that cleanup levels are achieved throughout the zone affected by the release by removing the waste constituents or treating them in place. Source control may be required. Also requires monitoring to determine the effectiveness of the corrective actions.	Applies to groundwater remedial actions.

#	Source	Standard, Requirement, Criterion, or Limitation	Description	Comments
18	California Safe Drinking Water Act (California Health & Safety Code Section 4010 et seq.)	- Title 22, CCR, Section 64400 et seq.	Requirements for public water systems. Includes Maximum Contaminant Levels (MCLs) and Secondary Maximum Contaminant Levels (SMCLs).	The act is legally applicable for an aquifer and associated distribution and pre-treatment system that is currently defined as "public water system" If it is only a potential "Public water system," then the act is relevant and appropriate.
19	Water Code Division 7, Chapter 5.5 (Chapter 5.5 added by Stats. 1972, Ch. 1256.)	NPDES regulations	The State implements the federal NPDES requirements in lieu of EPA in most situations.	These standards apply when discharging waste to surface waters of the U.S. May also include regular individual point source requirements and industrial, construction, and municipal stormwater requirements.
20	Porter-Cologne Water Quality Control Act (California Water Code Section 13176 [Amended by Stats. 2015, Ch. 673, Sec. 20. (AB 1531) Effective January 1, 2016.]	40 CFR Part 136	Requires that the analysis of material be performed in a State-certified laboratory.	Applies to all investigations and remedial actions.
21	Porter-Cologne Water Quality Control Act (California Water Code, Chapter 10, Article 3	DWR Bulletin 74	Specifies the requirements for water wells, monitoring wells, and cathodic protection.	Applies to all well installations.
22	Porter-Cologne Water Quality Control Act (California Water Code Sections: - 13307.1 [Amended by Stats. 2003, Ch. 62, Sec. 313. Effective January 1, 2004.] - 13304 (Amended by Stats. 2014, Ch. 739, Sec. 1. (AB 2442) Effective January 1, 2015.)	Land Use Restriction	If the state board or the regional board finds that the property is not suitable for unrestricted use and that a land use restriction is necessary for the protection of public health, safety, or the environment, then the state board and the regional boards may not issue a closure letter, or make a determination that no further action is required, unless a land use restriction is recorded or required to be recorded.	Applies to all remedial actions.
23	Clean Water Act (CWA) Section 401 (Updated June 7, 2019.)	Water Quality Certification	For remediation activities that impact Federal jurisdictional water of the United States (as determined by the ACOE).	Applies to all remedial actions involving excavation and discharge of material to jurisdictional waters of the U.S. and State waters including wetlands and other water bodies (e.g. vernal pools).

Attachment B: CRWQCB, Colorado Basin Region Soil/Sediment Remediation ARARs for Non-Time Critical Removal Action at MRP Site 2 at Naval Air Facility El Centro

#	Source	Standard, Requirement, Criterion, or Limitation	Description	Comments
1	Porter-Cologne Water Quality Control Act (California Water Code Sections: - 13240 [Added by Stats. 1969, Ch. 482] - 13241 [Amended by Stats. 1991, Ch. 187, Sec. 2.], - 13242 [Added by Stats. 1969, Ch. 482.] - 13243 [Added by Stats. 1969, Ch. 482.]	Water Quality Control Plan (Basin Plan) for the Colorado Basin Region. Chapter 2: Beneficial Uses, pages 2-1 through 2-18. (Includes amendments effective on or before January 8, 2019)	Establishes beneficial uses for surface and ground waters in the region.	Specific applicable portions of the Basin Plan include beneficial uses of affected water bodies. NAF El Centro is located over the Imperial Hydrologic Unit. The Basin Plan defines beneficial uses for groundwater beneath NAF El Centro as Municipal and Domestic Supply (MUN) and Industrial Service Supply (IND).
2	Porter-Cologne Water Quality Control Act (California Water Code Sections: - 13240 [Added by Stats. 1969, Ch. 482] - 13241 [Amended by Stats. 1991, Ch. 187, Sec. 2.], - 13242 [Added by Stats. 1969, Ch. 482.] - 13243 [Added by Stats. 1969, Ch. 482.]	Water Quality Control Plan (Basin Plan) for the Colorado Basin Region. Chapter 3: Water Quality Objectives, pages 3-1 through 3-11. (Includes amendments effective on or before January 8, 2019)	Establishes water quality objectives, including narrative and numerical standards that protect the beneficial uses and water quality objectives of surface and ground waters in the region. Describes implementation plans and other control measures designed to ensure compliance with statewide plans and policies.	Specific applicable portions of the Basin Plan include beneficial uses of affected water bodies and water quality objectives to protect those uses. Any activity, including, for example, a new discharge of contaminated soils or in-situ treatment or containment of contaminated soils that may affect water quality must not result in water quality exceeding water quality objectives. Implementation plans and other policies and requirements may also apply.
3	Water Quality Control Plan (Basin Plan) for the Colorado River Basin Region. (Includes amendments effective on or before January 8, 2019).	Narrative Toxicity Standard in the Colorado River Basin Regional Basin Plan. (Includes amendments effective on or before January 8, 2019)	Chapter III, Narrative Toxicity Objective, states as a policy that all waters shall be maintained free of toxic substances that produce detrimental physiological responses in human, plant animal, or aquatic life.	The narrative toxicity objective is a federally required water quality objective for surface waters and set forth in all basin plans. The Colorado Basin Region has a narrative toxicity objective that applies to groundwater.
4	Porter-Cologne Water Quality Control Act (California Water Code Sections: - 13240 [Added by Stats. 1969, Ch. 482] - 13241 [Amended by Stats. 1991, Ch. 187, Sec. 2.], - 13242 [Added by Stats. 1969, Ch. 482.] 13243 [Added by Stats. 1969, Ch. 482.]	Water Quality Control Plan (Basin Plan) for the Colorado Basin Region. Chapters 4-6 pages 4-1 through 6-13. (Includes amendments effective	Explains how the Regional Water Board applies numerical and narrative water quality objectives to ensure the reasonable protection of beneficial uses of water and how the Regional Water Board applies Resolution No. 68-16 to	Details the implementation of water quality objectives.

#	Source	Standard, Requirement, Criterion, or Limitation	Description	Comments
		on or before January 8, 2019)	promote the maintenance of existing high-quality waters.	
5	Porter-Cologne Water Quality Control Act (California Water Code Sections: <ul style="list-style-type: none"> - 13000 [Repealed and added by Stats. 1969, Ch. 482.] - 13140 [Added by Stats. 1969, Ch. 482.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13304 [Amended by Stats. 2014, Ch. 739, Sec. 1. (AB 2442) Effective January 1, 2015.] 	State Water Resources Control Board Resolution No. 68-16 ("Anti-degradation Policy").	Requires that high quality surface and ground waters be maintained to the maximum extent possible. Degradation of waters will be allowed (or allowed to remain) only if it is consistent with the maximum benefit to the people of the state, does not unreasonably affect present and anticipated beneficial uses, and does not result in water quality less than that prescribed in RWQCB and SWRCB policies. If degradation is allowed, the discharge must meet best practicable treatment or control, which must prevent pollution or nuisance and result in the highest water quality consistent with maximum benefit to the people of the state.	Applies to discharges of waste to waters, including discharges to soil that may affect surface or ground waters. In-situ cleanup levels for contaminated ground waters must be set at background level, unless allowing continued degradation is consistent with the maximum benefit of the people of the state. If degradation of waters is allowed, or allowed to remain, the discharge must meet best practical treatment or control standards, and result in the highest water quality possible that is consistent with the maximum benefit to the people of the state. In no case may water quality objectives be exceeded.
6	Porter-Cologne Water Quality Control Act (California Water Code Sections: <ul style="list-style-type: none"> - 13000 [Repealed and added by Stats. 1969, Ch. 482.] - 13140 [Added by Stats. 1969, Ch. 482.] - 13240 [Added by Stats. 1969, Ch. 482] - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13267 [Amended by Stats. 2006, Ch. 293, Sec. 2. Effective January 1, 2007.] - 13300 [Amended by Stats. 1971, Ch. 1288.] - 13304 [Amended by Stats. 2014, Ch. 739, Sec. 1. (AB 2442) Effective January 1, 2015.] - 13307 [Amended by Stats. 1993, Ch. 523, Sec. 2. Effective January 1, 1994.]) 	State Water Resources Control Board Resolution No. 92-49 (As amended April 21, 1994)	Establishes requirements for investigation and cleanup and abatement of discharges. Among other requirements, dischargers must clean up and abate the effects of discharges in a manner that promotes the attainment of either background water quality, or the best water quality that is reasonable if background water quality cannot be restored. Requires the application of Title 23, CCR, Section 2550.4, requirements to cleanups.	Applies to all cleanups of discharges that may affect water quality.

#	Source	Standard, Requirement, Criterion, or Limitation	Description	Comments
7	Porter-Cologne Water Quality Control Act (California Water Code Sections - 13000 [Repealed and added by Stats. 1969, Ch. 482.] - 13140 [Added by Stats. 1969, Ch. 482.] - 13240 [Added by Stats. 1969, Ch. 482] - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13267 [Amended by Stats. 2006, Ch. 293, Sec. 2. Effective January 1, 2007.] - 13300 [Amended by Stats. 1971, Ch. 1288.] - 13304 [Amended by Stats. 2014, Ch. 739, Sec. 1. (AB 2442) Effective January 1, 2015.] - 13307 [Amended by Stats. 1993, Ch. 523, Sec. 2. Effective January 1, 1994.]	State Water Resources Control Board Resolution 92-49, Section III.G	Section III.G of this Resolution states in part that dischargers are required to clean up and abate the effects of discharges in a manner that promotes attainment of background water quality, or the best water quality which is reasonable if background levels cannot be restored.	Remedial alternatives evaluated must consider attainment of the highest water quality that is economically and technically achievable and protects beneficial uses. Used to establish soil cleanup levels protective of groundwater and surface water.
8	Porter-Cologne Water Quality Control Act (California Water Code Sections: - 13000 [Repealed and added by Stats. 1969, Ch. 482.] - 13140 [Added by Stats. 1969, Ch. 482.] - 13240 [Added by Stats. 1969, Ch. 482.]	State Water Resources Control Board Resolution No. 88-63 ("Sources of Drinking Water Policy") (as contained in the Water Quality Control Plan [Basin Plan] for the Colorado River Basin Region)	Specifies that, with certain exceptions, all ground and surface waters must have the beneficial use of municipal or domestic water supply.	Applies in determining beneficial uses for waters that may be affected by discharges of waste.
9	Porter-Cologne Water Quality Control Act (California Water Code Sections: - 13140 [Added by Stats. 1969, Ch. 482.] - 13141 [Amended by Stats. 1976, Ch. 149.] - 13142 [Amended by Stats. 1995, Ch. 28, Sec. 18. Effective January 1, 1996.] - 13143 [Added by Stats. 1969, Ch. 482.] - 13144 [Added by Stats. 1969, Ch. 482.] - 13145 [Added by Stats. 1969, Ch. 482.]	- Title 27, CCR, Division 2, Subdivision 1 (Section 20080 et seq.) - Title 23, CCR, Division 3, Chapter 15 (Section 2510 et seq.).	Establishes waste and siting classification systems and minimum waste management standards for discharges of waste to land for treatment, storage, and disposal. Engineered alternatives that are consistent with Title 27/Title 23 performance goals may be considered. Establishes corrective action requirements for responding to	Applies to all discharges of waste to land for treatment, storage, or disposal that may affect water quality. The application of some of the specific sections of Title 27/ Title 23 to different situations is discussed below. Provisions of Title 23 apply to hazardous waste and provisions of Title 27 apply to designated and non-hazardous waste.

#	Source	Standard, Requirement, Criterion, or Limitation	Description	Comments
	<ul style="list-style-type: none"> - 13146 [Added by Stats. 1969, Ch. 482.] - 13147 [Amended by Stats. 1971, Ch. 1288.] - 13172 [Amended by Stats. 1989, Ch. 642, Sec. 3.] - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13267 [Amended by Stats. 2006, Ch. 293, Sec. 2. Effective January 1, 2007.] - 13304 [Amended by Stats. 2014, Ch. 739, Sec. 1. (AB 2442) Effective January 1, 2015.]) 	<ul style="list-style-type: none"> - Title 22, CCR, Division 4.5, (Section 66250 et seq.) 	discharges to land, including spills and leaks and other unauthorized discharges.	
10	Porter-Cologne Water Quality Control Act (California Water Code Sections: <ul style="list-style-type: none"> - 13140 [Added by Stats. 1969, Ch. 482.] - 13141 [Amended by Stats. 1976, Ch. 149.] - 13142 [Amended by Stats. 1995, Ch. 28, Sec. 18. Effective January 1, 1996.] - 13143 [Added by Stats. 1969, Ch. 482.] - 13144 [Added by Stats. 1969, Ch. 482.] - 13145 [Added by Stats. 1969, Ch. 482.] - 13146 [Added by Stats. 1969, Ch. 482.] - 13147 [Amended by Stats. 1971, Ch. 1288.] - 13172 [Amended by Stats. 1989, Ch. 642, Sec. 3.] - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13267 [Amended by Stats. 2006, Ch. 293, Sec. 2. Effective January 1, 2007.] - 13269 [Amended by Stats. 2004, Ch. 183, Sec. 360. Effective January 1, 2005.]) 	Title 23, CCR, Section, 2520, 2521	Requires that hazardous waste be discharged to Class I waste management units that meet certain design and monitoring standards.	Applies to discharges of hazardous waste to land for treatment, storage or disposal.

#	Source	Standard, Requirement, Criterion, or Limitation	Description	Comments
11	Porter-Cologne Water Quality Control Act (California Water Code Sections: - 13140 [Added by Stats. 1969, Ch. 482.] - 13141 [Amended by Stats. 1976, Ch. 149.] - 13142 [Amended by Stats. 1995, Ch. 28, Sec. 18. Effective January 1, 1996.] - 13143 [Added by Stats. 1969, Ch. 482.] - 13144 [Added by Stats. 1969, Ch. 482.] - 13145 [Added by Stats. 1969, Ch. 482.] - 13146 [Added by Stats. 1969, Ch. 482.] - 13147 [Amended by Stats. 1971, Ch. 1288.] - 13172 [Amended by Stats. 1989, Ch. 642, Sec. 3.] - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13267 [Amended by Stats. 2006, Ch. 293, Sec. 2. Effective January 1, 2007.] - 13269 [Amended by Stats. 2004, Ch. 183, Sec. 360. Effective January 1, 2005.]	Title 27, CCR, Section, 20200(c), 20210	Requires that designated waste be discharged to Class I or Class II waste management units.	Applies to discharges of designated waste (nonhazardous waste that could cause degradation of surface or ground waters) to land for treatment, storage, or disposal.
12	Porter-Cologne Water Quality Control Act (California Water Code Sections: - 13140 [Added by Stats. 1969, Ch. 482.] - 13141 [Amended by Stats. 1976, Ch. 149.] - 13142 [Amended by Stats. 1995, Ch. 28, Sec. 18. Effective January 1, 1996.] - 13143 [Added by Stats. 1969, Ch. 482.] - 13144 [Added by Stats. 1969, Ch. 482.] - 13145 [Added by Stats. 1969, Ch. 482.] - 13146 [Added by Stats. 1969, Ch. 482.] - 13147 [Amended by Stats. 1971, Ch. 1288.] - 13172 [Amended by Stats. 1989, Ch. 642, Sec. 3.]	Title 27, CCR, Section 20230	Requires that inert waste does not need to be discharged at classified units	Applies to discharges of inert waste to land for treatment, storage, or disposal.

#	Source	Standard, Requirement, Criterion, or Limitation	Description	Comments
	<ul style="list-style-type: none"> - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13267 [Amended by Stats. 2006, Ch. 293, Sec. 2. Effective January 1, 2007.] - 13269 [Amended by Stats. 2004, Ch. 183, Sec. 360. Effective January 1, 2005.] 			
13	Porter-Cologne Water Quality Control Act (California Water Code Sections: <ul style="list-style-type: none"> - 13140 [Added by Stats. 1969, Ch. 482.] - 13141 [Amended by Stats. 1976, Ch. 149.] - 13142 [Amended by Stats. 1995, Ch. 28, Sec. 18. Effective January 1, 1996.] - 13143 [Added by Stats. 1969, Ch. 482.] - 13144 [Added by Stats. 1969, Ch. 482.] - 13145 [Added by Stats. 1969, Ch. 482.] - 13146 [Added by Stats. 1969, Ch. 482.] - 13147 [Amended by Stats. 1971, Ch. 1288.] - 13172 [Amended by Stats. 1989, Ch. 642, Sec. 3.] - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13267 [Amended by Stats. 2006, Ch. 293, Sec. 2. Effective January 1, 2007.] - 13269 [Amended by Stats. 2004, Ch. 183, Sec. 360. Effective January 1, 2005.] 	Title 27, CCR, Section 20200 (c), 20220	Requires that nonhazardous solid waste be discharged to a classified waste management unit.	Applies to discharges of nonhazardous solid waste to land for treatment, storage, or disposal.
14	Porter-Cologne Water Quality Control Act (California Water Code Sections: <ul style="list-style-type: none"> - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] 	40 CFR Parts 122, 123, 124, National Pollution Discharge Elimination System, implemented by	Regulates pollutants in discharge of storm water associated with hazardous waste treatment, storage, and disposal facilities, wastewater treatment plants, landfills, land application sites, and	Applies to storm water discharges from industrial areas. Includes measures to minimize and/or eliminate pollutants in storm water discharges and monitoring to demonstrate compliance.

#	Source	Standard, Requirement, Criterion, or Limitation	Description	Comments
	<ul style="list-style-type: none"> - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13370.5 [Added by Stats. 1984, Ch. 1542, Sec. 1.] - 13372 [Amended by Stats. 2003, Ch. 683, Sec. 5. Effective January 1, 2004.] - 13373 [Amended by Stats. 1987, Ch. 1189, Sec. 4.] - 13374 [Added by Stats. 1972, Ch. 1256.] - 13375 [Added by Stats. 1972, Ch. 1256.] - 13376 [Amended by Stats. 2010, Ch. 288, Sec. 32. (SB 1169) Effective January 1, 2011.] - 13377 [Amended by Stats. 1978, Ch. 746.] - 13383 [Amended by Stats. 2003, Ch. 683, Sec. 6. Effective January 1, 2004.] 	California Storm water Permit for Industrial Activities, State Water Resources Control Board Order #97-03-DWQ.	open dumps. Requirements to ensure storm water discharges do not contribute to a violation of surface water quality standards.	
15	Porter-Cologne Water Quality Control Act (California Water Code Sections: <ul style="list-style-type: none"> - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13370.5 [Added by Stats. 1984, Ch. 1542, Sec. 1.] - 13372 [Amended by Stats. 2003, Ch. 683, Sec. 5. Effective January 1, 2004.] - 13373 [Amended by Stats. 1987, Ch. 1189, Sec. 4.] - 13374 [Added by Stats. 1972, Ch. 1256.] - 13375 [Added by Stats. 1972, Ch. 1256.] - 13376 [Amended by Stats. 2010, Ch. 288, Sec. 32. (SB 1169) Effective January 1, 2011.] 	40 CFR Parts 9, 122, 123, 124, National pollution discharge elimination system, implemented by State Water Resources Control Board Order No. 99-08 DWQ	Regulates pollutants in discharge of storm water associated with construction activity (clearing, grading, stockpiling, or excavation) involving the disturbance of 1 acre or more. Requirements to ensure storm water discharges do not contribute to a violation of surface water quality standards.	Applies to construction areas over 1 acre in size. Includes measures to minimize and/or eliminate pollutants in storm water discharges and monitoring to demonstrate compliance.

#	Source	Standard, Requirement, Criterion, or Limitation	Description	Comments
	<ul style="list-style-type: none"> - 13377 [Amended by Stats. 1978, Ch. 746.] - 13383 [Amended by Stats. 2003, Ch. 683, Sec. 6. Effective January 1, 2004.]) 			
16	Porter-Cologne Water Quality Control Act (California Water Code Sections: <ul style="list-style-type: none"> - 13140 [Added by Stats. 1969, Ch. 482.] - 13141 [Amended by Stats. 1976, Ch. 149.] - 13142 [Amended by Stats. 1995, Ch. 28, Sec. 18. Effective January 1, 1996.] - 13143 [Added by Stats. 1969, Ch. 482.] - 13144 [Added by Stats. 1969, Ch. 482.] - 13145 [Added by Stats. 1969, Ch. 482.] - 13146 [Added by Stats. 1969, Ch. 482.] - 13147 [Amended by Stats. 1971, Ch. 1288.] - 13172 [Amended by Stats. 1989, Ch. 642, Sec. 3.] - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13267 [Amended by Stats. 2006, Ch. 293, Sec. 2. Effective January 1, 2007.] - 13304 [Amended by Stats. 2014, Ch. 739, Sec. 1. (AB 2442) Effective January 1, 2015.]) 	<ul style="list-style-type: none"> - Title 27, CCR, Section 20080 (g) - Title 23, CCR, Section 2510 (g) 	Requires monitoring. If water quality is threatened, corrective action consistent with Title 27, Title 23 is required	Applies to areas of land where discharges had ceased as of November 27, 1984 (the effective date of the revised Title 27/ Title 23 regulations).
17	Porter-Cologne Water Quality Control Act (California Water Code Sections: <ul style="list-style-type: none"> - 13140 [Added by Stats. 1969, Ch. 482.] - 13141 [Amended by Stats. 1976, Ch. 149.] - 13142 [Amended by Stats. 1995, Ch. 28, Sec. 18. Effective January 1, 1996.] - 13143 [Added by Stats. 1969, Ch. 482.] - 13144 [Added by Stats. 1969, Ch. 482.] - 13145 [Added by Stats. 1969, Ch. 482.] 	<ul style="list-style-type: none"> - Title 27, CCR, Section 20090 (d) - Title 23, CCR, Section 2511 (d) 	Actions taken by public agencies to clean up unauthorized releases are generally exempt from Title 27/ Title 23. One exception is that wastes removed from immediate place of release and discharged to land must be managed in accordance with classification (Title 27, CCR, Section 20200/ Title 23, CCR, Section 2520) and siting requirements of Title 27 or Title 23.	Applies to remediation and monitoring of sites. Before action, waste must be classified and disposed of consistent with its classification.

#	Source	Standard, Requirement, Criterion, or Limitation	Description	Comments
	<ul style="list-style-type: none"> - 13146 [Added by Stats. 1969, Ch. 482.] - 13147 [Amended by Stats. 1971, Ch. 1288.] - 13172 [Amended by Stats. 1989, Ch. 642, Sec. 3.] - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13267 [Amended by Stats. 2006, Ch. 293, Sec. 2. Effective January 1, 2007.] - 13304 [Amended by Stats. 2014, Ch. 739, Sec. 1. (AB 2442) Effective January 1, 2015.] 			
18	Porter-Cologne Water Quality Control Act (California Water Code Sections: <ul style="list-style-type: none"> - 13140 [Added by Stats. 1969, Ch. 482.] - 13141 [Amended by Stats. 1976, Ch. 149.] - 13142 [Amended by Stats. 1995, Ch. 28, Sec. 18. Effective January 1, 1996.] - 13143 [Added by Stats. 1969, Ch. 482.] - 13144 [Added by Stats. 1969, Ch. 482.] - 13145 [Added by Stats. 1969, Ch. 482.] - 13146 [Added by Stats. 1969, Ch. 482.] - 13147 [Amended by Stats. 1971, Ch. 1288.] - 13172 [Amended by Stats. 1989, Ch. 642, Sec. 3.] - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13267 [Amended by Stats. 2006, Ch. 293, Sec. 2. Effective January 1, 2007.] - 13304 [Amended by Stats. 2014, Ch. 739, Sec. 1. (AB 2442) Effective January 1, 2015.] 	<ul style="list-style-type: none"> - Title 27, CCR, Section 20090 (d) - Title 23, CCR, Section 2511 (d) 	Actions taken by public agencies to clean up unauthorized releases are generally exempt from Title 27/ Title 23. One exception is that wastes contained or left in place must comply with Title 27 or Title 23 to the extent feasible.	Applies to remediation and monitoring of sites.

#	Source	Standard, Requirement, Criterion, or Limitation	Description	Comments
19	Porter-Cologne Water Quality Control Act (California Water Code Sections: - 13140 [Added by Stats. 1969, Ch. 482.] - 13141 [Amended by Stats. 1976, Ch. 149.] - 13142 [Amended by Stats. 1995, Ch. 28, Sec. 18. Effective January 1, 1996.] - 13143 [Added by Stats. 1969, Ch. 482.] - 13144 [Added by Stats. 1969, Ch. 482.] - 13145 [Added by Stats. 1969, Ch. 482.] - 13146 [Added by Stats. 1969, Ch. 482.] - 13147 [Amended by Stats. 1971, Ch. 1288.] - 13172 [Amended by Stats. 1989, Ch. 642, Sec. 3.] - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13267 [Amended by Stats. 2006, Ch. 293, Sec. 2. Effective January 1, 2007.] - 13304 [Amended by Stats. 2014, Ch. 739, Sec. 1. (AB 2442) Effective January 1, 2015.])	- Title 27, CCR, Section 20080 (d) - Title 23, CCR, Section 2510 (d)	Requires closure of existing waste management units according to Title 27/Title 23	Applies to "existing" waste management units (i.e., areas where waste was discharged to land on or before 27 November 1984, but that were not closed, abandoned, or inactive prior to that date).
20	Porter-Cologne Water Quality Control Act (California Water Code Sections: - 13140 [Added by Stats. 1969, Ch. 482.] - 13141 [Amended by Stats. 1976, Ch. 149.] - 13142 [Amended by Stats. 1995, Ch. 28, Sec. 18. Effective January 1, 1996.] - 13143 [Added by Stats. 1969, Ch. 482.] - 13144 [Added by Stats. 1969, Ch. 482.] - 13145 [Added by Stats. 1969, Ch. 482.] - 13146 [Added by Stats. 1969, Ch. 482.] - 13147 [Amended by Stats. 1971, Ch. 1288.] - 13172 [Amended by Stats. 1989, Ch. 642, Sec. 3.]	- Title 27, CCR, Section 21400 - Title 23, CCR, Section 2582	Requires surface impoundments to be closed by removing and treating all free liquid and either removing all remaining contamination or closing the surface impoundment as a landfill.	If water quality is threatened, this section is relevant and appropriate for natural topographic depressions, excavations, and diked areas where wastes containing free liquids were discharged.

#	Source	Standard, Requirement, Criterion, or Limitation	Description	Comments
	<ul style="list-style-type: none"> - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13269 [Amended by Stats. 2004, Ch. 183, Sec. 360. Effective January 1, 2005.]) 			
21	Porter-Cologne Water Quality Control Act (California Water Code Sections: <ul style="list-style-type: none"> - 13140 [Added by Stats. 1969, Ch. 482.] - 13141 [Amended by Stats. 1976, Ch. 149.] - 13142 [Amended by Stats. 1995, Ch. 28, Sec. 18. Effective January 1, 1996.] - 13143 [Added by Stats. 1969, Ch. 482.] - 13144 [Added by Stats. 1969, Ch. 482.] - 13145 [Added by Stats. 1969, Ch. 482.] - 13146 [Added by Stats. 1969, Ch. 482.] - 13147 [Amended by Stats. 1971, Ch. 1288.] - 13172 [Amended by Stats. 1989, Ch. 642, Sec. 3.] - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13267 [Amended by Stats. 2006, Ch. 293, Sec. 2. Effective January 1, 2007.] - 13269 [Amended by Stats. 2004, Ch. 183, Sec. 360. Effective January 1, 2005.]) 	<ul style="list-style-type: none"> - Title 27, CCR, Sections 20385-20435 - Title 23, CCR, Section 2550 	Where groundwater monitoring is required under 2510 or 2511 of Ch 15 (and equivalent for Title 27), applies to authorized waste management units as well as unauthorized discharges of waste to land and to closed abandoned or inactive units.	Applies to all areas in which waste has been discharged to land to determine the threat to water quality.
22	Porter-Cologne Water Quality Control Act (California Water Code Sections: <ul style="list-style-type: none"> - 13140 [Added by Stats. 1969, Ch. 482.] - 13141 [Amended by Stats. 1976, Ch. 149.] - 13142 [Amended by Stats. 1995, Ch. 28, Sec. 18. Effective January 1, 1996.] 	<ul style="list-style-type: none"> - Title 27, CCR, Section 20385 - Title 23, CCR, Section 2550.1 	Requires detection monitoring. Once a significant release has occurred, evaluation or corrective action monitoring is required.	Applies to all areas in which waste has been discharged to land to determine the threat to water quality.

#	Source	Standard, Requirement, Criterion, or Limitation	Description	Comments
	<ul style="list-style-type: none"> - 13143 [Added by Stats. 1969, Ch. 482.] - 13144 [Added by Stats. 1969, Ch. 482.] - 13145 [Added by Stats. 1969, Ch. 482.] - 13146 [Added by Stats. 1969, Ch. 482.] - 13147 [Amended by Stats. 1971, Ch. 1288.] - 13172 [Amended by Stats. 1989, Ch. 642, Sec. 3.] - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13267 [Amended by Stats. 2006, Ch. 293, Sec. 2. Effective January 1, 2007.] - 13269 [Amended by Stats. 2004, Ch. 183, Sec. 360. Effective January 1, 2005.] 			
23	Porter-Cologne Water Quality Control Act (California Water Code Sections: <ul style="list-style-type: none"> - 13140 [Added by Stats. 1969, Ch. 482.] - 13141 [Amended by Stats. 1976, Ch. 149.] - 13142 [Amended by Stats. 1995, Ch. 28, Sec. 18. Effective January 1, 1996.] - 13143 [Added by Stats. 1969, Ch. 482.] - 13144 [Added by Stats. 1969, Ch. 482.] - 13145 [Added by Stats. 1969, Ch. 482.] - 13146 [Added by Stats. 1969, Ch. 482.] - 13147 [Amended by Stats. 1971, Ch. 1288.] - 13172 [Amended by Stats. 1989, Ch. 642, Sec. 3.] - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13267 [Amended by Stats. 2006, Ch. 293, Sec. 2. Effective January 1, 2007.] 	<ul style="list-style-type: none"> - Title 27, CCR, Section 20390 - Title 23, CCR, Section 2550.2 	Requires establishment of a water quality protection standard consisting of a list of constituents of concern, concentration limits, compliance monitoring points and all monitoring points. This section further specifies the time period that the standard shall apply.	Applies to all areas in which waste has been discharged to land where groundwater is threatened.

#	Source	Standard, Requirement, Criterion, or Limitation	Description	Comments
	- 13269 [Amended by Stats. 2004, Ch. 183, Sec. 360. Effective January 1, 2005.]			
24	Porter-Cologne Water Quality Control Act (California Water Code Sections: - 13140 [Added by Stats. 1969, Ch. 482.] - 13141 [Amended by Stats. 1976, Ch. 149.] - 13142 [Amended by Stats. 1995, Ch. 28, Sec. 18. Effective January 1, 1996.] - 13143 [Added by Stats. 1969, Ch. 482.] - 13144 [Added by Stats. 1969, Ch. 482.] - 13145 [Added by Stats. 1969, Ch. 482.] - 13146 [Added by Stats. 1969, Ch. 482.] - 13147 [Amended by Stats. 1971, Ch. 1288.] - 13172 [Amended by Stats. 1989, Ch. 642, Sec. 3.] - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13267 [Amended by Stats. 2006, Ch. 293, Sec. 2. Effective January 1, 2007.] - 13269 [Amended by Stats. 2004, Ch. 183, Sec. 360. Effective January 1, 2005.]	- Title 27, CCR, Section 20395 - Title 23, CCR, Section 2550.3	Requires development of a list of constituents of concern which include all waste constituents that are reasonably expected to be present in the soil from discharges to land and could adversely affect water quality.	Applies to all areas in which waste has been discharged to land where groundwater is threatened.
25	Porter-Cologne Water Quality Control Act (California Water Code Sections: - 13140 [Added by Stats. 1969, Ch. 482.] - 13141 [Amended by Stats. 1976, Ch. 149.] - 13142 [Amended by Stats. 1995, Ch. 28, Sec. 18. Effective January 1, 1996.] - 13143 [Added by Stats. 1969, Ch. 482.] - 13144 [Added by Stats. 1969, Ch. 482.] - 13145 [Added by Stats. 1969, Ch. 482.] - 13146 [Added by Stats. 1969, Ch. 482.]	- Title 27, CCR, Section 20400 - Title 23, CCR, Section 2550.4	Concentration limits must be established for groundwater, surface water, and the unsaturated zone. Must be based on background, equal to background, or for corrective actions, may be greater than background, not to exceed the lower of the applicable water quality objective or the concentration technologically or economically achievable. Specific factors must be considered in setting	If water quality is threatened, this section applies in setting soil cleanup levels for all cleanups of discharges of waste to land.

#	Source	Standard, Requirement, Criterion, or Limitation	Description	Comments
	<ul style="list-style-type: none"> - 13147 [Amended by Stats. 1971, Ch. 1288.] - 13172 [Amended by Stats. 1989, Ch. 642, Sec. 3.] - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13267 [Amended by Stats. 2006, Ch. 293, Sec. 2. Effective January 1, 2007.] - 13269 [Amended by Stats. 2004, Ch. 183, Sec. 360. Effective January 1, 2005.] 		cleanup standards above background levels.	
26	Porter-Cologne Water Quality Control Act (California Water Code Sections: <ul style="list-style-type: none"> - 13140 [Added by Stats. 1969, Ch. 482.] - 13141 [Amended by Stats. 1976, Ch. 149.] - 13142 [Amended by Stats. 1995, Ch. 28, Sec. 18. Effective January 1, 1996.] - 13143 [Added by Stats. 1969, Ch. 482.] - 13144 [Added by Stats. 1969, Ch. 482.] - 13145 [Added by Stats. 1969, Ch. 482.] - 13146 [Added by Stats. 1969, Ch. 482.] - 13147 [Amended by Stats. 1971, Ch. 1288.] - 13172 [Amended by Stats. 1989, Ch. 642, Sec. 3.] - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13267 [Amended by Stats. 2006, Ch. 293, Sec. 2. Effective January 1, 2007.] - 13269 [Amended by Stats. 2004, Ch. 183, Sec. 360. Effective January 1, 2005.] 	<ul style="list-style-type: none"> - Title 27, CCR, Section 20405 - Title 23, CCR, Section 2550.5 	Requires identification of the point of compliance, hydraulically down gradient from the area where waste was discharged to land.	Applies to all areas in which waste has been discharged to land where groundwater is threatened.

#	Source	Standard, Requirement, Criterion, or Limitation	Description	Comments
27	Porter-Cologne Water Quality Control Act (California Water Code Sections: - 13140 [Added by Stats. 1969, Ch. 482.] - 13141 [Amended by Stats. 1976, Ch. 149.] - 13142 [Amended by Stats. 1995, Ch. 28, Sec. 18. Effective January 1, 1996.] - 13143 [Added by Stats. 1969, Ch. 482.] - 13144 [Added by Stats. 1969, Ch. 482.] - 13145 [Added by Stats. 1969, Ch. 482.] - 13146 [Added by Stats. 1969, Ch. 482.] - 13147 [Amended by Stats. 1971, Ch. 1288.] - 13172 [Amended by Stats. 1989, Ch. 642, Sec. 3.] - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13267 [Amended by Stats. 2006, Ch. 293, Sec. 2. Effective January 1, 2007.] - 13269 [Amended by Stats. 2004, Ch. 183, Sec. 360. Effective January 1, 2005.]	- Title 27, CCR, Section 20410 - Title 23, CCR, Section 2550.6	Requires monitoring for compliance with remedial action objectives for three years from the date of achieving cleanup levels.	Applies to all soil cleanup activities.
28	Porter-Cologne Water Quality Control Act (California Water Code Sections: - 13140 [Added by Stats. 1969, Ch. 482.] - 13141 [Amended by Stats. 1976, Ch. 149.] - 13142 [Amended by Stats. 1995, Ch. 28, Sec. 18. Effective January 1, 1996.] - 13143 [Added by Stats. 1969, Ch. 482.] - 13144 [Added by Stats. 1969, Ch. 482.] - 13145 [Added by Stats. 1969, Ch. 482.] - 13146 [Added by Stats. 1969, Ch. 482.] - 13147 [Amended by Stats. 1971, Ch. 1288.] - 13172 [Amended by Stats. 1989, Ch. 642, Sec. 3.]	- Title 27, CCR, Section 20415 - Title 23, CCR, Section 2550.7	Requires general soil, surface water, and ground water monitoring.	Applies to all areas in which waste has been discharged to land.

#	Source	Standard, Requirement, Criterion, or Limitation	Description	Comments
	<ul style="list-style-type: none"> - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13267 [Amended by Stats. 2006, Ch. 293, Sec. 2. Effective January 1, 2007.] - 13269 [Amended by Stats. 2004, Ch. 183, Sec. 360. Effective January 1, 2005.] 			
29	Porter-Cologne Water Quality Control Act (California Water Code Sections: <ul style="list-style-type: none"> - 13140 [Added by Stats. 1969, Ch. 482.] - 13141 [Amended by Stats. 1976, Ch. 149.] - 13142 [Amended by Stats. 1995, Ch. 28, Sec. 18. Effective January 1, 1996.] - 13143 [Added by Stats. 1969, Ch. 482.] - 13144 [Added by Stats. 1969, Ch. 482.] - 13145 [Added by Stats. 1969, Ch. 482.] - 13146 [Added by Stats. 1969, Ch. 482.] - 13147 [Amended by Stats. 1971, Ch. 1288.] - 13172 [Amended by Stats. 1989, Ch. 642, Sec. 3.] - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13267 [Amended by Stats. 2006, Ch. 293, Sec. 2. Effective January 1, 2007.] - 13269 [Amended by Stats. 2004, Ch. 183, Sec. 360. Effective January 1, 2005.] 	<ul style="list-style-type: none"> - Title 27, CCR, Section 20420 - Title 23, CCR, Section 2550.8. 	Requires detection monitoring to determine if a release has occurred.	Applies to all areas where waste has been discharged to land and groundwater is threatened.
30	Porter-Cologne Water Quality Control Act (California Water Code Sections: <ul style="list-style-type: none"> - 13140 [Added by Stats. 1969, Ch. 482.] - 13141 [Amended by Stats. 1976, Ch. 149.] 	<ul style="list-style-type: none"> - Title 27, CCR, Section 20425 - Title 23, CCR, Section 2550.9 	Requires an assessment of the nature and extent of the release, including a determination of the spatial distribution and concentration of each constituent.	Applies to sites at which monitoring results show statistically significant evidence of a release.

#	Source	Standard, Requirement, Criterion, or Limitation	Description	Comments
	<ul style="list-style-type: none"> - 13142 [Amended by Stats. 1995, Ch. 28, Sec. 18. Effective January 1, 1996.] - 13143 [Added by Stats. 1969, Ch. 482.] - 13144 [Added by Stats. 1969, Ch. 482.] - 13145 [Added by Stats. 1969, Ch. 482.] - 13146 [Added by Stats. 1969, Ch. 482.] - 13147 [Amended by Stats. 1971, Ch. 1288.] - 13172 [Amended by Stats. 1989, Ch. 642, Sec. 3.] - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13267 [Amended by Stats. 2006, Ch. 293, Sec. 2. Effective January 1, 2007.] - 13269 [Amended by Stats. 2004, Ch. 183, Sec. 360. Effective January 1, 2005.] 			
31	Porter-Cologne Water Quality Control Act (California Water Code Sections: <ul style="list-style-type: none"> - 13140 [Added by Stats. 1969, Ch. 482.] - 13141 [Amended by Stats. 1976, Ch. 149.] - 13142 [Amended by Stats. 1995, Ch. 28, Sec. 18. Effective January 1, 1996.] - 13143 [Added by Stats. 1969, Ch. 482.] - 13144 [Added by Stats. 1969, Ch. 482.] - 13145 [Added by Stats. 1969, Ch. 482.] - 13146 [Added by Stats. 1969, Ch. 482.] - 13147 [Amended by Stats. 1971, Ch. 1288.] - 13172 [Amended by Stats. 1989, Ch. 642, Sec. 3.] - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] 	<ul style="list-style-type: none"> - Title 27, CCR, Section 20430 - Title 23, CCR, Section 2550.10 	Requires implementation of corrective action measures that ensure that cleanup levels (i.e., water quality protection standard established under section 2550.2) are achieved throughout the zone affected by the release by removing the waste constituents or treating them in place. Source control may be required. Also requires monitoring to determine the effectiveness of the corrective actions.	If water quality is threatened, this section applies to all soil cleanup activities.

#	Source	Standard, Requirement, Criterion, or Limitation	Description	Comments
	<ul style="list-style-type: none"> - 13267 [Amended by Stats. 2006, Ch. 293, Sec. 2. Effective January 1, 2007.] - 13269 [Amended by Stats. 2004, Ch. 183, Sec. 360. Effective January 1, 2005.] 			
32	Porter-Cologne Water Quality Control Act (California Water Code Sections: <ul style="list-style-type: none"> - 13140 [Added by Stats. 1969, Ch. 482.] - 13141 [Amended by Stats. 1976, Ch. 149.] - 13142 [Amended by Stats. 1995, Ch. 28, Sec. 18. Effective January 1, 1996.] - 13143 [Added by Stats. 1969, Ch. 482.] - 13144 [Added by Stats. 1969, Ch. 482.] - 13145 [Added by Stats. 1969, Ch. 482.] - 13146 [Added by Stats. 1969, Ch. 482.] - 13147 [Amended by Stats. 1971, Ch. 1288.] - 13172 [Amended by Stats. 1989, Ch. 642, Sec. 3.] - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13267 [Amended by Stats. 2006, Ch. 293, Sec. 2. Effective January 1, 2007.] - 13269 [Amended by Stats. 2004, Ch. 183, Sec. 360. Effective January 1, 2005.] 	<ul style="list-style-type: none"> - Title 27, CCR, Section 20950; 22207 (a); 22212 (a), and 22222. - Title 23, CCR, Section 2550.0 (b); 2580; 2580(f). 	General closure requirements, including continued maintenance of waste containment, drainage controls, and groundwater monitoring throughout the closure and post-closure maintenance periods.	Applies to partial or final closure of waste management units.
33	Porter-Cologne Water Quality Control Act (California Water Code Sections: <ul style="list-style-type: none"> - 13140 [Added by Stats. 1969, Ch. 482.] - 13141 [Amended by Stats. 1976, Ch. 149.] - 13142 [Amended by Stats. 1995, Ch. 28, Sec. 18. Effective January 1, 1996.] - 13143 [Added by Stats. 1969, Ch. 482.] - 13144 [Added by Stats. 1969, Ch. 482.] - 13145 [Added by Stats. 1969, Ch. 482.] 	Title 27 CCR Section 20950 (a)(2)(B)	(2) Performance Standards -The performance standards applicable to closure of a Unit and, for Units that are not clean-closed, to post-closure maintenance at the Unit are as follows: (B) Unit Clean-Closed - for Units that are clean-closed, the goal of closure is to physically remove all waste and contaminated materials from the Unit and from its underlying and surrounding	Applicable to excavated soil to determine partial or final closure of waste management units.

#	Source	Standard, Requirement, Criterion, or Limitation	Description	Comments
	<ul style="list-style-type: none"> - 13146 [Added by Stats. 1969, Ch. 482.] - 13147 [Amended by Stats. 1971, Ch. 1288.] - 13172 [Amended by Stats. 1989, Ch. 642, Sec. 3.] - 13260 [Amended by Stats. 2011, Ch. 2, Sec. 28. (AB 95) Effective March 24, 2011.] - 13263 [Amended by Stats. 1995, Ch. 421, Sec. 2. Effective January 1, 1996.] - 13267 [Amended by Stats. 2006, Ch. 293, Sec. 2. Effective January 1, 2007.] - 13269 [Amended by Stats. 2004, Ch. 183, Sec. 360. Effective January 1, 2005.] 		environs, such that the waste in the Unit no longer poses a threat to water quality. Successful completion of clean-closure eliminates the need for any post-closure maintenance period and removes the Unit from being subject to the SWRCB-promulgated requirements of this subdivision.	
34	Clean Water Act – National Pollutant Discharge Elimination System (NPDES) Program	California Toxics Rule (CTR) 40 CFR Part 131	Water quality standards: EPA adopted water quality criteria that apply in California, called the California Toxics Rule (CTR). The CTR establishes water quality standards that apply to NPDES discharges when certain conditions are met.	The CTR is an ARAR for the Parcel C-6 sites that pose a threat to surface water quality. The CTR establishes criteria for surface water quality; therefore, it is an ARAR for discharge of surface water run off potentially polluted from up gradient sources.
35	Porter-Cologne Water Quality Control Act (California Water Code Section 13176 [Amended by Stats. 2015, Ch. 673, Sec. 20. (AB 1531) Effective January 1, 2016.]	40 CFR Part 136	Requires that the analysis of material be performed in a State-certified laboratory.	Applies to all investigations and remedial actions.
36	Porter-Cologne Water Quality Control Act (California Water Code, Chapter 10, Article 3 [Chapter 10 added by Stats. 1969, Ch. 482.]	DWR Bulletin 74	Specifies the requirements for water wells, monitoring wells, and cathodic protection.	Applies to all well installations.
37	Porter-Cologne Water Quality Control Act (California Water Code Sections: <ul style="list-style-type: none"> - 13307.1 [Amended by Stats. 2003, Ch. 62, Sec. 313. Effective January 1, 2004.] - 13304 (Amended by Stats. 2014, Ch. 739, Sec. 1. (AB 2442) Effective January 1, 2015.) 	Land Use Restriction	If the state board or the regional board finds that the property is not suitable for unrestricted use and that a land use restriction is necessary for the protection of public health, safety, or the environment, then the state board and the regional boards may not issue a closure letter, or make a determination that no further action is required, unless	Applies to all remedial actions.

#	Source	Standard, Requirement, Criterion, or Limitation	Description	Comments
			a land use restriction is recorded or required to be recorded.	
38	Clean Water Act (CWA) Section 401 (Updated June 7, 2019.)	Water Quality Certification	For remediation activities that impact Federal jurisdictional water of the United States (as determined by the ACOE).	Applies to all remedial actions involving excavation and discharge of material to jurisdictional waters of the U.S. and State waters including wetlands and other water bodies (e.g. vernal pools).

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Attachment A3

Navy Response to State ARARs

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Attachment A3. Navy Response to State Applicable or Relevant and Appropriate Requirements

Requirement	Prerequisite	Citation	Accepted ARAR Citation	Preliminary ARAR Determination	Comments
California Regional Water Quality Control Board for the Colorado River Basin (State ARAR Response dated April 2020)					
Describes the water basins in the Colorado River Basin region, establishes beneficial uses of groundwater and surface water, establishes WQOs, including narrative and numerical standards, establishes implementation plans to meet WQOs and protect beneficial uses, and incorporates statewide quality control plans and policies.	Waters of the state	Water Quality Control Plan for the Colorado River Basin	--	Not an ARAR	Groundwater is not a medium of concern for MRP Site 2. NAF El Centro is located in the Imperial hydrologic unit and is designated with a municipal and industrial beneficial use. However, as acknowledged in the Basin Plan, only a small portion of the Imperial hydrologic unit has an actual municipal use. Groundwater from other areas at NAF El Centro generally do not meet the criteria for municipal beneficial use given the level of total dissolved solids (SWES, 2012). Therefore, shallow groundwater beneath MRP Site 2 may be unsuitable for municipal use. Although some industrial uses may be applicable, none are presently known to exist or are planned to be implemented. In addition, contamination in the soil is not expected to have impacted groundwater.
Requires that high quality surface and ground waters be maintained to the maximum extent possible. Degradation of waters will be allowed only if it is consistent with the maximum benefit to the people of the state, does not unreasonably affect present and anticipated beneficial uses, and does not result in water quality less than that prescribed in Water Board and SWRCB policies. If degradation is allowed, the discharge must meet best practicable treatment or control, which must prevent pollution or nuisance and result in the highest water quality consistent with maximum benefit to the people of the state.	Discharge to waters of the state	SWRCB Resolution 68-16	--	Not an ARAR	Groundwater is not a medium of concern for MRP Site 2. In addition, neither of the alternatives evaluate a discharge to waters of the state.

Attachment A3. Navy Response to State Applicable or Relevant and Appropriate Requirements

Requirement	Prerequisite	Citation	Accepted ARAR Citation	Preliminary ARAR Determination	Comments
Establishes requirements for investigation and cleanup and abatement of discharges. Among other requirements, dischargers must clean up and abate the effects of discharges in a manner that promotes the attainment of either background water quality, or the best water quality that is reasonable if background water quality cannot be restored. Requires the application of Cal. Code Regs. tit. 23, § 2550.4 requirements to cleanups.	Groundwater remedial action	SWRCB 92-49	--	Not an ARAR	Groundwater is not medium of concern for MRP Site 2 and groundwater remediation is not necessary.
Specifies that, with certain exceptions, all ground and surface waters must have the beneficial use of municipal or domestic water supply.	Waters of the state	SWRCB Resolution 88-63	--	Not an ARAR	Groundwater is not a medium of concern for MRP Site 2. Shallow groundwater beneath MRP Site 2 may be unsuitable for municipal use. Although some industrial uses may be applicable, none are presently known to exist or are planned to be implemented.
Actions taken by public agencies to cleanup unauthorized releases are generally exempt from Title 27, except that wastes removed from the immediate place of release and discharges to land must be managed in accordance with classification and siting requirements of Title 27.	Action taken by a public agency to address the release of solid waste	Cal. Code Regs. tit. 27, § 20090(d)	Cal. Code Regs. tit. 27, § 20090(d)	Relevant and appropriate	The Navy accepts the regulation in the accepted ARAR citation column as a potential state ARAR for addressing MRP Site 2. Waste removed from MRP Site 2 for offsite disposal will be disposed of at an appropriate facility based on the classification of the waste.
Water quality monitoring and response programs.	Solid waste facility	Cal. Code Regs. tit. 27, Division 2, Subdivision 1, Chapter 3, Subchapter 3, Article 1	--	Not ARARs	The Navy does not accept these regulations as potential state ARARs. Groundwater is not a medium of concern and contamination in the soil is not expected to have impacted groundwater.
Maximum contaminant levels for sources of drinking water.	Drinking water	Cal. Code Regs. tit. 22, Division 4, Chapter 15	--	Not ARARs	The Navy does not accept these as potential state ARARs. These requirements are for drinking water. The groundwater underneath El Centro is not a source of drinking water and based on high, naturally occurring concentrations of total dissolved solids, is not likely to be a source of drinking water.

Attachment A3. Navy Response to State Applicable or Relevant and Appropriate Requirements

Requirement	Prerequisite	Citation	Accepted ARAR Citation	Preliminary ARAR Determination	Comments
Requirements for analysis of pollutants under the Clean Water Act.	Discharge under the Clean Water Act	40 CFR Part 136	40 CFR Part 136	Applicable	The Navy has identified these requirements as potential federal ARARs for sampling and analysis associated with stormwater discharges associated with construction activity in Alternative 3.
Requirements for water wells, monitoring wells, and cathodic protection.	Construction of a groundwater well	DWR Bulletin 74	--	Not an ARAR or TBC	The Navy does not accept this as a potential state ARAR or TBC because none of the alternatives evaluate constructing a groundwater well. DWR Bulletin 74 does not appear to be in effect for well standards; DWR Bulletins 74-81 and 74-90 appear to be in effect at this time.
Requirements for state water quality certification when a discharge into waters of the United States is planned.	Discharge into waters of the United States.	Clean Water Act § 401	--	Not an ARAR	The Navy will not identify this as a potential federal ARAR. None of the alternatives include a discharge to waters of the United States.
Requirement to accurately characterize waste and the definitions of designated waste, nonhazardous solid waste, and inert waste.	Waste	Cal. Code Regs. tit. 27, §§ 20200(c), 20210, 20220, and 20230	Cal. Code Regs. tit. 27, §§ 20200(c), 20210, 20220, 20230	Applicable	The Navy accepts these as potential state ARARs for characterizing waste, including waste soil, generated for offsite disposal.
Regulates pollutants in the discharge of storm water associated with hazardous waste treatment, storage, and disposal facilities, wastewater treatment plants, landfills, land application sites, and open dumps. Requirements to ensure storm water discharges do not contribute to a violation of surface water quality standards.	Discharge to water	40 CFR Parts 9, 122, 123, and 124	40 CFR § 122.44(k)(2) and (4)	Applicable	The Navy has identified the requirements in the accepted ARAR citation column as potential federal ARARs for stormwater discharge associated with Alternative 3.
Prior to closure, inactive waste management units must comply with the substantive requirements for eliminating most non-storm water discharges, developing and implementing a stormwater pollution prevention plan, and performing monitoring of stormwater discharges.	Listed standard industrial classification code	SWRCB Order 97-03-DWQ This order was superseded by SWRCB Order 2014-0057-DWQ	--	Not an ARAR or TBC	These requirements are associated with industrial activities at a site, which do not pertain to the CERCLA removal action alternatives being evaluated.

Attachment A3. Navy Response to State Applicable or Relevant and Appropriate Requirements

Requirement	Prerequisite	Citation	Accepted ARAR Citation	Preliminary ARAR Determination	Comments
Requires BMPs, developing and implementing a stormwater pollution prevention plan, and monitoring of stormwater discharges. Contains numeric effluent limits and action levels.	Construction that disturbs one or more acres of soil	SWRCB Order 99-08-DWQ This order was superseded by SWRCB Order 2009-0009-DWQ, as amended by 2010-0014-DWQ and 2012-0006-DWQ	--	TBC	Pursuant to CERCLA § 121(e), onsite response actions are exempt from the requirement to obtain a permit. Therefore, the Navy is not required to obtain a State of California General Construction Activity Storm Water Permit for Alternative 3. Although not an ARAR, the Navy would implement the substantive provisions of this permit in Alternative 3 to comply with the federal Clean Water Act ARARs for stormwater discharge.
Closed, abandoned, or inactive unit	Solid waste unit that was closed, abandoned, or inactive on or before November 27, 1984	Cal. Code Regs. tit. 27, § 20080(g)	--	Not an ARAR	MRP Site 2 is not a closed, abandoned, or inactive unit and the provision that a detection monitoring program may be necessary is not well-suited to the circumstances of the site. Impacts to groundwater from MRP Site 2 are not anticipated because of the limited vertical migration of the chemicals of potential concern, low precipitation, high evaporation, and soil characteristics.
Existing and new solid waste units which were operating or had received all permits necessary for construction and operation on or before November 27, 1984, are designated as existing units. Existing units shall be closed and maintained according to Subchapter 5, Chapter 3.	Existing unit as of November 27, 1984, or new unit constructed after November 27, 1984	Cal. Code Regs. tit. 27, § 20080(d)	--	Not an ARAR	The Navy does not accept this as a potential ARAR. MRP Site 2 is not an existing or new solid waste disposal unit and these requirements regarding solid waste disposal units are not well-suited to the circumstances of the release of hazardous substances at the site.
Closure requirements for surface impoundments.	Surface impoundment	Cal. Code Regs. tit. 27, § 21400	--	Not an ARAR	The Navy does not accept these requirements as potential state ARARs. There is no surface impoundment at MRP Site 2.

Attachment A3. Navy Response to State Applicable or Relevant and Appropriate Requirements

Requirement	Prerequisite	Citation	Accepted ARAR Citation	Preliminary ARAR Determination	Comments
Closure of classified units including the performance standard for units closed as a landfill or waste pile of minimizing the infiltration of water and maintaining the unit to ensure compliance during the post-closure period; and the requirement for the vegetative layer.	Closure of a solid waste facility	Cal. Code Regs. tit. 27, §§ 20950, 22207(a), 22212(a), and 22222	--	Not an ARAR	The Navy does not accept these requirements as potential state ARARs. There is no solid waste facility on MRP Site 2 and these requirements regarding closure of solid waste disposal units are not well-suited to the circumstances of the release of hazardous substances at the site.
California Toxics Rule	Point source discharge to surface water	40 CFR Part 131	--	Not an ARAR	The Navy did not identify the California Toxics Rule as a potential federal ARAR because neither of the alternatives evaluate the point source discharge to surface water.
Requirements for handling and managing hazardous waste.		Cal. Code Regs. tit. 23, Division 3, Chapter 15	--	Not ARARs	The Navy does not accept these as potential state ARARs. Based on in situ characterization, the waste at the site is not expected to be hazardous waste and the Navy has accepted various requirements from Cal. Code Regs. tit. 27.
California Department of Toxic Substances Control (State ARAR Response dated February 20, 2020)^a					
Defines wastes that are subject to regulation as RCRA hazardous waste or non-RCRA state regulated (California) hazardous wastes.	Waste	Cal. Code Regs. tit. 22, §§ 66261.2-.3; 66261.21, .23-.24; 66261.100-.101, .107, .110, .111, .113, .122	Cal. Code Regs. tit. 22, §§ 66261.3(a)(2)(C), 66261.3(a)(2)(F), 66261.22(a)(3) and (4), 66261.24(a)(2)-(a)(8), 66261.101(a)(1) and (a)(2)	Applicable	The Navy accepts the regulations in the accepted ARAR column as potential state chemical-specific ARARs for characterizing non-RCRA state regulated hazardous waste. Waste and waste soil would be generated in Alternative 3. The Navy would characterize the waste at the time it is generated and, if the waste is non-RCRA state regulated hazardous waste, dispose of it at an appropriate offsite facility.
A waste is a RCRA hazardous waste if it is listed in this article, unless it has been excluded.	Waste	Cal. Code Regs. tit. 22, Division 4.5, Chapter 11, Article 4	--	Not ARARs	The Navy does not accept these regulations as potential ARARs. There is no listed waste at MRP Site 2.

Attachment A3. Navy Response to State Applicable or Relevant and Appropriate Requirements

Requirement	Prerequisite	Citation	Accepted ARAR Citation	Preliminary ARAR Determination	Comments
Standards applicable to generators of hazardous waste; a person who generates a waste must determine if the waste is hazardous.	Waste	Cal. Code Regs. tit. 22, Division 4.5, Chapter 12, Articles 1-4, § 66262.10-.47	Cal. Code Regs. tit. 22, §§ 66262.10(a) and 66262.11	Applicable	The Navy has identified the regulations in the accepted ARAR column as potential federal chemical-specific ARARs requiring that generators determine if the generated waste is hazardous. These regulations are identified as potential federal ARARs because they are part of a delegated federal RCRA program.
Packaging, labeling, marking, and placarding hazardous waste that will be transported.	Offsite transportation of hazardous waste	Cal. Code Regs. tit. 22, § 66262.30-.33	--	Not ARARs	The Navy does not accept these regulations as potential ARARs. These regulations are for the offsite transportation of hazardous waste, which will occur in Alternative 3. ARARs apply to removal actions completed onsite. Offsite actions must comply with independently applicable requirements (not relevant and appropriate) and must comply with both substantive and procedural requirements. Since these requirements are for the offsite transportation of hazardous waste, these requirements would be independently applicable for the transportation of waste that is determined to be hazardous waste.
Standards applicable to transporters of hazardous waste.	Offsite transportation of hazardous waste	Cal. Code Regs. tit. 22, Division 4.5, Chapter 13, Article 1, § 66263	--	Not ARARs	The Navy does not accept these regulations as potential ARARs. These regulations are applicable to transporters of hazardous waste; offsite transportation will occur in Alternative 3. ARARs apply to removal actions completed onsite. Offsite actions must comply with independently applicable requirements (not relevant and appropriate) and must comply with both substantive and procedural requirements. Since the transportation of waste will occur offsite, these requirements would be independently applicable requirements for the transportation of waste that is determined to be hazardous waste.

Attachment A3. Navy Response to State Applicable or Relevant and Appropriate Requirements

Requirement	Prerequisite	Citation	Accepted ARAR Citation	Preliminary ARAR Determination	Comments
Requires the owner or operator to inspect the facility for malfunctions and deterioration, operator errors, and discharges which may be causing or may lead to the release of hazardous waste constituents to the environment or a threat to human health.	Hazardous waste facility	Cal. Code Regs. tit. 22, § 66264.15(a)	--	Not an ARAR	The Navy does not accept this regulation as a potential ARARs. This regulation is applicable to an operating hazardous waste facility and MRP Site 2 is not an operating facility. Further, alternatives that leave waste in place will be inspected and monitored pursuant to the requirements of CERCLA.
Owner or operator of a hazardous waste transfer, treatment, storage, or disposal facility shall ensure that facility personnel successfully complete a training program that teaches facility personnel to perform their duties in a way that ensures the facility is in compliance with requirements.	Hazardous waste facility	Cal. Code Regs. tit. 22, § 66264.16	--	Not an ARAR	The Navy does not accept this regulation as a potential ARAR. This is a procedural requirement; not a substantive environmental standard.
The owner or operator shall take precautions to prevent accidental ignition or reaction of ignitable or reactive waste.	Hazardous waste facility	Cal. Code Regs. tit. 22, § 66264.17(a) and (b)	--	Not an ARAR	The Navy does not accept these regulations as potential ARARs. This regulation is applicable to an operating hazardous waste facility and MRP Site 2 is not an operating facility. MRP Site 2 was used as a small arms range; small arms ammunition has been determined not to exhibit the characteristic of reactivity. In addition, no MEC is expected on MRP Site 2.
Seismic and precipitation design standards.	Hazardous waste facility	Cal. Code Regs. tit. 22 § 66264.25	--	Not ARARs	The Navy does not accept this regulation as a potential ARAR. This regulation is applicable to an operating hazardous waste facility and MRP Site 2 is not an operating facility. Further, none of the alternatives in the EE/CA evaluate the construction of a hazardous waste unit.
Hazardous waste facility preparedness and prevention requirements.	Hazardous waste facility	Cal. Code Regs. tit. 22, § 66264.31, .32, .34	--	Not ARARs	The Navy does not accept these regulations as potential ARARs. These are regulations for the design and operation of a facility so that there is no sudden release, fire, or explosion. The Navy is not constructing a hazardous waste facility as part of the alternatives.

Attachment A3. Navy Response to State Applicable or Relevant and Appropriate Requirements

Requirement	Prerequisite	Citation	Accepted ARAR Citation	Preliminary ARAR Determination	Comments
Water quality monitoring and response program requirements.	Hazardous waste facility	Cal. Code Regs. tit. 22, Division 4.5, Chapter 14, Article 6	--	Not ARARs	The Navy does not accept these regulations as potential ARARs. Groundwater is not a medium of concern for MRP Site 2. Groundwater is not expected to be impacted due to the limited vertical migration in soil, low precipitation, high evaporation, and other site-specific soil characteristics.
Requirements for managing hazardous waste in containers.	Hazardous waste stored in containers	Cal. Code Regs. tit. 22, §§ 66264.171-.174, .175(a), (b), and (d), .176-.178	Cal. Code Regs. tit. 22, § 66264.171-66264.174, 66264.175(a) and (b), and 66264.178	Relevant and appropriate	The Navy has identified the requirements in the accepted ARAR citation column as potential federal action-specific ARARs for Alternative 3. Excavated soil and waste may be stored in containers; however, not all the waste is expected to be RCRA hazardous waste.
Requirements for managing hazardous waste in tanks.	Hazardous waste stored in tanks	Cal. Code Regs. tit. 22, Division 4.5, Chapter 14, Article 10	--	Not ARARs	The Navy does not accept these regulations as potential ARARs. None of the alternatives include the construction of a tank to hold hazardous waste.
Requirements for hazardous waste piles.	Hazardous waste pile	Cal. Code Regs. tit. 22, § 66264.251-.256	--	Not ARARs	The Navy does not accept these regulations as potential ARARs. There is no hazardous waste pile at the site and none of the alternatives include the construction of a hazardous waste pile. Further, requirements for waste piles are not well-suited to the circumstances of the release of hazardous substances at the site.
Requirements for treating or disposing of hazardous waste in land treatment units.	Hazardous waste in land treatment units	Cal. Code Regs. tit. 22, Division 4.5, Chapter 14, Article 13	--	Not ARARs	The Navy does not accept these regulations as potential ARARs. None of the alternatives evaluate a land treatment unit to treat or dispose of hazardous waste.
Design and operating requirements for hazardous waste landfills.	Hazardous waste facility	Cal. Code Regs. tit. 22, § 66264.301-.304	--	Not ARARs	The Navy does not accept these regulations as potential ARARs. These requirements are applicable to operating landfills. MRP Site 2 is not an operating hazardous waste disposal facility.
Requirements for surveyed benchmarks at each cell location with horizontal and vertical controls.	Hazardous waste facility	Cal. Code Regs. tit. 22, § 66264.309(a)	--	Not ARARs	The Navy does not accept these regulations as potential ARARs. None of the alternatives include the construction of a hazardous waste landfill.

Attachment A3. Navy Response to State Applicable or Relevant and Appropriate Requirements

Requirement	Prerequisite	Citation	Accepted ARAR Citation	Preliminary ARAR Determination	Comments
Closure and post-closure requirements	Hazardous waste facility	Cal. Code Regs. tit. 22, § 66264.310(a), (b)(1), (4), and (5)	--	Not ARARs	The Navy does not accept these regulations as potential ARARs. None of the alternatives include the construction of a hazardous waste landfill.
Requirements for CAMUs	Consolidation of hazardous waste from different sites	Cal. Code Regs. tit. 22, Division 4.5, Chapter 14, Article 15.5	--	Not ARARs	The Navy does not accept these regulations as potential ARARs. None of the alternatives include the construction of a CAMU.
Requirements for miscellaneous units	Hazardous waste in a miscellaneous unit	Cal. Code Regs. tit. 22, § 66264.601	--	Not an ARAR	The Navy does not accept these regulations as potential ARARs. None of the alternatives include the construction of a miscellaneous unit.
Identifies hazardous wastes that are restricted from land disposal without prior treatment and prohibits the dilution of restricted waste as a substitute for adequate treatment. Also allows for a case-by-case extension of the effective date of applicable restrictions.	Hazardous waste that will be disposed of on land	Cal. Code Regs. tit. 22, § 66268.1, .3, and .7	--	Not ARARs	The Navy does not accept these regulations as potential ARARs. Most of the regulations present procedural requirements; procedural requirements are not ARARs. If the waste generated in Alternative 3 is determined to be hazardous and if it is subject to land disposal restrictions, the required treatment and disposal will take place offsite. ARARs apply to onsite actions and the disposal of the waste, including any necessary treatment prior to land disposal, will occur offsite. Offsite actions must comply with independently applicable requirements (not relevant and appropriate) and must comply with both substantive and procedural requirements. The Navy did identify Cal. Code Regs. tit. 22, § 66268.9(a) as a potential federal action-specific ARAR for determining the waste code to determine applicable treatment standards because characterizing the waste is an activity that will take place onsite.

Attachment A3. Navy Response to State Applicable or Relevant and Appropriate Requirements

Requirement	Prerequisite	Citation	Accepted ARAR Citation	Preliminary ARAR Determination	Comments
Requires the initial generator of a hazardous waste to determine each USEPA hazardous waste number.	Hazardous waste	Cal. Code Regs. tit. 22, § 66268.9	Cal. Code Regs. tit. 22, § 66268.9(a)	Applicable	The Navy identified the regulation in the accepted ARAR column as a potential ARAR for waste generated in Alternatives 3 through 6 that is identified as hazardous waste. This determination will be made at the same time the determination as to whether or not the waste is hazardous is made.
Allows remediation waste to be moved within a single area of contamination without triggering LDR requirements.	Hazardous waste subject to LDRs	USEPA Area of Contamination Policy	--	Not an ARAR or TBC	This guidance document is not identified as an ARAR or TBC. The objective of the TBC category is not to identify guidance documents that inform decision making for a CERCLA site. The Navy does not anticipate moving waste around within the site. But if such movement happens, it does not trigger LDRs. Other waste that is determined to be hazardous that will be shipped offsite for disposal will be evaluated to determine applicability of LDRs prior to land disposal.
Land disposal restrictions	Hazardous waste and Non-RCRA hazardous waste	Cal. Code Regs. Division 4.5, Chapter 18, Articles 2, 3, 4, 5, 10, and 11	--	Not ARARs	The Navy does not accept these regulations as potential ARARs. If the waste generated in Alternative 3 is determined to be hazardous and subject to land disposal restrictions, the required treatment and disposal will take place offsite. ARARs apply to onsite actions and the disposal of the waste, including any necessary treatment prior to land disposal, will occur offsite. Offsite actions must comply with independently applicable requirements (not relevant and appropriate) and must comply with both substantive and procedural requirements. The Navy did identify Cal. Code Regs. tit. 22, § 66268.9(a) as a potential federal action-specific ARAR for determining the waste code to determine applicable treatment standards because characterizing the waste is an activity that will take place onsite.

Attachment A3. Navy Response to State Applicable or Relevant and Appropriate Requirements

Requirement	Prerequisite	Citation	Accepted ARAR Citation	Preliminary ARAR Determination	Comments
Information needed for DTSC to consider a variance from a land use restriction imposed by DTSC.	A covenant to restrict the use of property on the site	Cal. Code Regs. tit. 22, § 67390.2	--	Not an ARAR	The Navy does not accept this regulation as a potential ARAR. MRP Site 2 is on an active military base with no plans for closure and transfer out of federal government ownership. A covenant to restrict the use of property cannot be placed on the land while it is owned by the federal government.
Requirements for land use covenants or other property restrictions.	Concentrations of hazardous materials, hazardous wastes or constituents, or hazardous substances on property at levels not suitable for unrestricted use of the land.	Cal. Code Regs. tit. 22, § 67391.1	Cal. Code Regs. tit. 22, § 67391.1(e)(2)	Relevant and appropriate	The Navy accepts the regulation in the accepted ARAR citation column as a potential state ARAR for Alternative 2. This alternative would leave waste in place so future use of MRP Site 2 would be restricted to prevent exposure. The restrictions would be contained in the base master plan and the Navy's IC database.
Land use covenant agreements and requirements	Land use covenant	California Civil Code § 1471(a)-(d) California Health and Safety Code §§ 25202.5, 25221, 25355.5(a)(1)(C)	--	Not ARARs	The Navy does not accept any of these statutory provisions as potential ARARs. MRP Site 2 is property owned by the federal government and managed by the Navy. It is infeasible to enter into and record a land use covenant. Instead, the Navy would record the institutional control in the base master plan and the Navy's IC database.
Temporary staging piles	Hazardous waste	40 CFR § 264.554	--	Not ARARs	The Navy does not accept these regulations as potential ARARs. None of the alternatives evaluate the construction of a temporary staging pile.
Health and ecological risk assessment shall be based on subpart I of the NCP and USEPA policies, guidance, and practices and the most current sound scientific methods, knowledge, and practices.	Response action taken pursuant to Chapter 6.8	California Health and Safety Code § 25356.1.5(b)	--	Not an ARAR	The Navy does not accept this statutory provision as a potential state ARAR. The Navy is addressing MRP Site 2 pursuant to the requirements of CERCLA and the NCP. This will result in compliance with this provision since this provision, in turn, requires compliance with the NCP and USEPA policies, guidelines, and practices.

Attachment A3. Navy Response to State Applicable or Relevant and Appropriate Requirements

Requirement	Prerequisite	Citation	Accepted ARAR Citation	Preliminary ARAR Determination	Comments
Toxicity criteria for use in human health risk assessments, human health-based screening levels, and human health-based remediation goals.	Cleanup of a release of hazardous waste or hazardous constituents, hazardous materials, and hazardous substances pursuant to California Health and Safety Code, Division 20, Chapters 6.8 and 6.82.	Cal. Code Regs. tit. 22, Division 4.5, Chapter 51, Article 2	--	Not ARARs	The Navy's recommended action is to pursue unlimited use/unrestricted exposure by removing the risk driver of lead that exceeds concentrations of both the State of California and the USEPA residential standards.
California Department of Fish and Wildlife (State ARAR Response Dated February 18, 2020)					
Prohibits depositing or placing and of the listed materials where it can enter waters of the state.	Discharge not authorized under California Water Code § 13263 or a waiver issued pursuant to § 13269(a)	Cal. Fish and Game Code § 5650(a)	--	Not an ARAR	The Navy does not accept this statute as a potential state ARAR. There is an irrigation drainage canal near the eastern boundary of the site. However, that drainage canal is no longer being used since irrigation has been suspended and it is approximately 300 feet from the removal action area. Therefore, the Navy's activities will not impact the irrigation drainage canal. In addition, the Navy has identified the stormwater discharge requirements associated with construction activities as potential ARARs. These requirements will prevent materials from entering the irrigation drainage canal.

Attachment A3. Navy Response to State Applicable or Relevant and Appropriate Requirements

Requirement	Prerequisite	Citation	Accepted ARAR Citation	Preliminary ARAR Determination	Comments
Prohibits the taking of birds or mammals with any net, pound, cage, trap, set line or wire, or poisonous substance, or to possess birds or mammals so taken, whether taken within or without the state.	Bird or mammal onsite	Cal. Fish and Game Code § 3005	--	Not an ARAR	The Navy does not accept this statute as a potential state ARAR. The statute does not address problems or situations sufficiently similar to the circumstances of the release or CERCLA remedial action and is not well-suited to the site. Further, the ERA concluded that COPECs are below levels that would be expected to pose ecological risk to ecological receptors that may use the site. Please see Appendix A Section A.3.2 for a complete discussion of the Navy's position on this state requirement.
Prohibits the taking of endangered or rare native plants.	Endangered or rare native plant onsite	Cal. Fish and Game Code § 1908	--	Not an ARAR	The Navy does not accept this as a potential ARAR because there are no endangered or rare native plants on or near the site.
Prohibits the taking of state threatened or endangered species.	State threatened or endangered species onsite.	Cal. Fish and Game Code § 2080	--	Not an ARAR	The Navy does not accept this statute as a potential state ARAR. No state threatened or endangered species is present or potentially present on the site.
Prohibits the taking of fully protected birds.	Fully protected birds onsite.	Cal. Fish and Game Code § 3511	--	Not an ARAR	The Navy does not accept this statute as a potential state ARAR. No fully protected birds are present or potentially present on the site.
Prohibiting the taking of bird nests or eggs.	Presence of nests or eggs onsite.	Cal. Fish and Game Code § 3503	--	Not an ARAR	The Navy does not accept this statute as a potential state ARAR. The statute does not address problems or situations sufficiently similar to the circumstances of the release or CERCLA remedial action and is not well-suited to the site. Please see Appendix A Section A.3.2 for a complete discussion of the Navy's position on this state requirement.
Prohibits the needless destruction of any birds of prey or their eggs.	Presence of birds of prey or their nests.	Cal. Fish and Game Code § 3503.5	--	Not an ARAR	The State has withdrawn its previous identification of this requirement as a state ARAR in light of the Navy's identification of the substantive provisions of the Migratory Bird Treaty Act as a relevant and appropriate federal ARAR for this action.

Attachment A3. Navy Response to State Applicable or Relevant and Appropriate Requirements

Requirement	Prerequisite	Citation	Accepted ARAR Citation	Preliminary ARAR Determination	Comments
Prohibits the taking of migratory nongame birds.	Presence of nongame birds	Cal. Fish and Game Code § 3513	--	Not an ARAR	The State has withdrawn its previous identification of this requirement as a state ARAR in light of the Navy's identification of the substantive provisions of the Migratory Bird Treaty Act as a relevant and appropriate federal ARAR for this action.
Fisher, marten, river otter, desert kit fox, and red fox may not be taken at any time.	Presence of furbearing mammals.	Cal. Code Regs. tit. 14, § 460	--	Not an ARAR	The Navy does not accept this regulation as a potential state ARAR because the desert kit fox is not present or potentially present on the site. Please see Appendix A Section A.3.2 for a complete discussion of the Navy's position on this state requirement.
Action to protect wetlands	Wetland	Fish and Game Commission Wetlands Policy (adopted 1987)	--	Not an ARAR or TBC	The Navy does not accept this as a potential ARAR or TBC because there are no wetlands on or near the site and none of the alternatives will affect wetlands.
Reclamation of mined lands must conserve rare, threatened, or endangered species, or species of special concern and their habitat.	Reclamation of mined lands.	Cal. Code Regs. tit. 14, § 3703 Cal. Code Regs. tit. 14, § 15380(d) (definitions of endangered, rare, or threatened) Cal. Code Regs. tit. 14, § 15063, 15065	--	Not an ARAR or TBC	The Navy does not accept these regulations as potential state ARARs or TBCs. Cal. Code Regs. tit. 14, § 3703 is applicable to reclaiming mined land, which is not what is occurring at MRP Site 2. The regulation is not relevant and appropriate because it is not well-suited to the removal activities being evaluated. The other regulations are procedural requirements and procedural requirements are not ARARs. It is also not necessary to identify any of these regulation as TBCs. There are adequate statutory and regulatory provisions for the protection of special status species.

^a The DTSC state ARAR response enclosure letter included the statement that Sections 1-11, 13, 14, 17, 22-31, 34-39, 56, 58, 61-64, 67, 70, 75-79, 81-83, 85-91, 127-132, 134, and 135 were applicable to MRP Site 2. These sections were reviewed as potential state ARARs. The DTSC state ARAR response also included sections in addition to these listed. These additional sections were not reviewed as potential ARARs for MRP Site 2, since DTSC did not identify them as applicable to MRP Site 2. The entirety of DTSC's response, including the sections evaluated and not evaluated, are included in Attachment A2.

Reference:

SWES, 2012. Semiannual Groundwater Monitoring Report for Installation Restoration Sites 1, 2, 7, and Designated Background Wells, Naval Air Facility, El Centro, California. October.

Notes:

§ = Section

ARAR = applicable or relevant and appropriate

bgs = below ground surface

BMP = best management practice

Cal. Code Regs. = California Code of Regulations

CAMU = corrective action management unit

CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act

CFR = Code of Federal Regulations

COPEC = chemical of potential concern

CTR = California Toxics Rule

DTSC = California Department of Toxic Substances Control

DWR = California Department of Water Resources

IC = institutional control

LDR = land disposal restriction

MEC = munitions and explosives of concern

MRP = Munitions Response Program

Navy = Department of the Navy

NCP = National Oil and Hazardous Substances Pollution Contingency Plan

NTR = National Toxics Rule

PLECA = Point Loma Ecological Conservation Area

RCRA = Resource Conservation and Recovery Act

SWPPP = stormwater pollution prevention plan

SWRCB = State Water Resources Control Board

TBC = to be considered

tit. = Title

U.S.C. = United States Code

USEPA = US Environmental Protection Agency

Water Board = Regional Water Quality Control Board

WDR = Waste Discharge Requirements

WQO = water quality objective

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Appendix B

Cost Estimate

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B.1 Introduction

This appendix presents engineering evaluation cost estimates for potential removal action alternatives for the Munitions Response Program (MRP) Site 2, Former Small Arms Range, Naval Air Facility (NAF) El Centro, El Centro, California. Costs for Alternatives 2 and 3 are provided; Alternative 1 (No Action) has no associated costs. Both capital and operations and maintenance (O&M) costs are included. Capital costs consist of direct (i.e., construction) and indirect (i.e., nonconstruction and overhead) costs. O&M covers postconstruction costs necessary to ensure the continued effectiveness of a removal action; it also includes operating labor, maintenance materials and labor, auxiliary materials and energy, disposal of residues, sampling labor and analytical materials, and administration costs.

In accordance with United States Environmental Protection Agency (USEPA) guidelines, the cost estimates for each alternative are order-of-magnitude estimates. Estimates of this type are generally accurate within plus 50 percent to minus 30 percent. The extent of this range implies that there is a high probability the final projected cost will fall within this range. The accuracy of the estimates is subject to substantial variation because details of the specific design will not be known until the remedy is implemented. For example, the actual site conditions, project scope and schedule, design details, competitive market conditions, changes during construction, labor and equipment rates, and other variables are not known. In addition, there is uncertainty in the estimate of the volume of contaminated media on which this cost estimate is based.

Furthermore, the selection of technologies or process options to estimate costs is not intended to limit flexibility during remedial design. Remedial design efforts might reveal possible cost savings as a result of value engineering studies and reduce the cost of implementing the remedy.

Costs were estimated in accordance with USEPA guidelines (USEPA, 2000) using the Remedial Action Cost Engineering Requirement (RACER) system Version 11.0.98.0, which is a PC-based system originally developed in 1992 by the United States Air Force. The system allows the user to select the desired models from a list of available technologies, define the required parameters in the selected technology, and tailor the estimate by verifying and editing secondary parameters. RACER calculates quantities for each technology; localizes unit costs for materials, equipment, and labor; adjusts unit prices for safety and productivity losses; and applies markups to account for indirect costs. RACER uses current multi-agency pricing data and is researched and updated annually to ensure accuracy. RACER currently addresses environmental investigations and cleanup projects. The technology cost details reports for all technologies generated by RACER are provided at the end of this appendix (**Attachments B1 and B2**). A discount rate of 1.5 percent was used for the calculations for Alternatives 2 and 3 as taken from the most recent revision of Appendix C of Office of Management and Budget Circular A-94 (OMB 2018). The following formula was used to calculate the present value:

$$PV_{30} = A ([1+I]^n - 1) / (I[1+I]^n) \quad (1)$$

where:

- I = discount rate
- n = number of years from 2019
- A = annual cost

The methodology and information used to develop the cost estimates and the costs for each alternative by site are presented in the following sections.

B.2 Components of Costs

Table B-1 identifies the components of each alternative. The costs for each component are assembled into the cost estimates for each alternative. A summary of the costs by alternative is presented in **Table B-2**. Cost estimate assumptions are present in **Table B-3**. Detailed cost estimates for Alternatives 2 and 3 are presented in **Tables B-4** and **B-5**, respectively. Tables are provided at the end of this appendix. Descriptions of the various components are presented in the following sections.

B.2.1 Institutional Controls

Costs for developing, maintaining, monitoring, and enforcing land use covenants and other institutional controls (ICs) are included in the costs to implement Alternative 2. The capital costs associated with ICs included planning meetings, documents, and implementation.

B.2.2 Planning Documents

Costs for planning documents are included in costs to implement Alternative 3. Capital costs associated with planning documents include a land use control implementation plan, which documents the implementation of ICs and the monitoring and inspection requirements. Alternative 3 would also include an Accident Prevention Plan and Site Health and Safety Plan would be prepared meeting Department of the Navy (Navy) requirements. Field work would be conducted in accordance with an Explosives Safety Submission Determination Request and a non-time critical removal action work plan and/or remedial design. Prior to excavation, a dig permit and approval to work within the flight line area would be obtained from NAF El Centro.

B.2.3 Annual Inspections and Reporting

Alternative 2 would require annual inspections to verify land use at the site. A duration of 30 years is assumed for cost estimation purposes. The activities associated with annual IC inspections consists of site inspection and reporting. A technician will inspect the site on an annual basis and record any observations. The reporting costs were assumed to include writing a single letter report, with review by a qualified person (licensed professional engineer, geologist, or other professional). The total hours for project managers, engineers, draftsman, and other supporting staff are estimated to be 33 hours per year for annual monitoring tasks. The implementation and performance of the ICs will be reviewed once every 5 years to determine whether it remains protective of human health and the environment. Should the ownership of the site be transferred to another entity, ICs will be transferred along with the site and continue to be enforced by the owner of the site.

B.2.4 Biological Survey and Monitoring

Costs for a Navy biologist to monitor activities and identify any impacts to sensitive species if present at the site are included in the costs to implement Alternative 3. Additional costs include environmental safety training and a burrowing owl survey prior to implementation, and weekly burrowing owl surveys during project implementation. The capital costs associated with biological surveys and monitoring included planning meetings, documents, and implementation.

B.2.5 Site Preparation

The site preparation component of Alternative 3 includes obtaining all applicable local, state, and federal approvals; preparation of schedules, submittals, and required plans; and establishment of temporary site offices, utility hookups, site security, utility locating, construction of a decontamination pad, stockpile areas, truck tarping stations, run-on/run-off control, and erosion control.

B.2.6 Excavate, Transport, Treat, and Dispose of Soil

Excavation, transport, treatment and disposal of soil is included as a component of Alternative 3. Unit costs for excavation of contaminated soil are presented in **Table B-5**. The costs for excavation are dependent mainly on the results of waste characterization and the disposal facility required for the excavated soil. The costs in **Table B-5** were estimated with the assumption that subsurface obstructions, such as utilities, would not be encountered. The excavated soil will be staged onsite in accordance with federal and/or state requirements and will be properly disposed of based on waste profiling results. Excavated soil would require proper characterization in accordance with applicable federal and State of California regulations. It is assumed that excavated soil for Alternative 3 would be transported to a Resource Conservation and Recovery Act (RCRA) Subtitle C (Class I within California) hazardous waste landfill.

It should be noted that in addition to the federal Toxicity Characteristic Leaching Procedure, the State of California applies an additional leaching procedure known as the Soluble Threshold Limit Concentration, as outlined in Titles 22 and 26 of the California Code of Regulations (CCR). These leaching procedures are considered conservative and are intended to simulate the conditions that may be present in a landfill where water may pass through the landfill waste and travel into the groundwater, carrying the soluble materials with it. The Total Threshold Limit Concentration (TTLC) analysis determines the total concentration of each target analyte in a sample and is generally performed first. If the target analyte exceeds the TTLC limits, the waste is classified as hazardous and further testing is not required. If the TTLC limits are not exceeded, the results are used to determine whether the Soluble Threshold Limit Concentration procedure is necessary.

Soil may be classified as RCRA and/or non-RCRA hazardous waste. Analytical results of waste characterization samples will be used to profile the waste and evaluate whether soil is subject to land disposal restrictions as described in 22 CCR Section 66268.49. Waste characterization results exceeding land disposal restrictions would require soil to be treated prior to land disposal either to concentrations less than the universal treatment standard or the alternative soil standards (treated to 10 times the universal treatment standard [as listed in 22 CCR 66268.48] or to a 90 percent reduction, whichever is higher). Cost estimates are based on the assumption that 30 percent of soil excavated would contain concentrations of lead exceeding the RCRA hazardous characteristic concentration for lead, which would require treatment through a solidification/stabilization process prior to disposal at an RCRA Subtitle C facility.

B.2.7 Confirmation Sampling

Alternative 3 would require the collection of soil samples to ensure that the lateral and vertical extents of the excavations were adequate for achieving removal action objectives. It is estimated that five incremental confirmation samples will be collected and analyzed for lead

from the boring location in Alternative 3. It is anticipated that samples will be submitted for an expedited analysis because excavation activities could be driven by sample results.

B.2.8 Backfill and Surface Restoration

The costs for imported backfill (including the material, acceptance sampling, hauling, and placement) and excavation backfilling are dependent on the removal volume associated with Alternative 3. It is assumed that the backfill volume will be the same as the excavated volume.

Surface restoration includes re-grading the surface and restoring the surface to existing site conditions.

B.2.9 Site Close-Out Documentation

Alternative 3 requires completion of Site Close-Out documentation. Site Close-Out documentation will be completed once excavation and site restoration are completed. It was assumed that close-out documentation will require the support of a Project Manager, Staff Scientist, Word Processor, Senior Staff Engineer, Staff Engineer, and CADD drafter.

B.3 References

Office of Management and Budget (OMB). 2018. *Discount Rates for Cost-Effectiveness, Lease Purchase, and Related Analyses*. Appendix C of Budget Circular A-94 (published January 1992). November.

United States Environmental Protection Agency (USEPA). 2000. *A Guide to Developing and Documenting Cost Estimates during the Feasibility Study*. OSWER 9355.0-75. July.

Tables

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Table B-1. Components of Remedial Alternatives

Component	Alternative 1 No Action	Alternative 2 Institutional Controls	Alternative 3 Excavation and Off-Site Disposal
Remedial Design			√
Biological Survey and Monitoring			√
Institutional controls		√	
Annual Inspections and Reporting		√	
Site Preparation			√
Excavate, transport, treat, and dispose of soil			√
Confirmation Sampling			√
Site Restoration			√
5 Year Reviews		√	
Site Close-out Documentation			√

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Table B-2. Summary of Costs for Soil Alternatives

Alternative	Total Capital Cost (\$)	Total O&M Cost (\$)	Total Present-Worth Cost (30-year Period of Performance for Alternative 2) (\$)
1 – No Action	0	0	0
2 – Institutional Controls	259,000	507,000	776,000
3 – Excavation and Offsite Disposal	180,000	0	213,000

Notes:

\$ = U.S. dollars

O&M = operations and maintenance

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Table B-3. Cost Estimate Assumptions

Components	Assumptions
Alternative 1 – No Action	
Alternative 2 – Institutional Controls	
ICs	<ul style="list-style-type: none"> The ICs will prohibit future residential development and use of Munitions Response Program Site 2. ICs will prohibit activities that could expose receptors to soil that has not been characterized, such as soil beneath the existing paved areas, buildings, and structures throughout Munitions Response Program Site 2. IC compliance monitoring reports will be prepared annually.
Reporting	<ul style="list-style-type: none"> An interim Removal Action Completion Report will be prepared, documenting the implementation of ICs. Annual IC compliance monitoring reports will also be prepared for a duration of 30 years is assumed for costing purposes. Six 5-year reviews are assumed to be conducted as required under CERCLA and NCP requirements.
Alternative 3 – Excavation and Offsite Disposal	
Remedial Design	<ul style="list-style-type: none"> Prepare a RAWP to describe the basis of design, key assumptions, design details, specifications, and other design details for remedy implementation.
Biological Monitoring	<ul style="list-style-type: none"> A Navy biologist will monitor activities before and during construction to identify any impacts to sensitive species if present at the site. Sensitive plant species will be identified and flagged for avoidance. Burrowing owl surveys will be conducted before, and weekly during construction activity. Biological monitoring details will be described in remedial design and RAWP documents.
Site Preparation	<ul style="list-style-type: none"> Perform ground utility surveys by identifying soil stockpile and parking areas. Identify and mark buried utilities to avoid damage to these structures during excavation. Conduct a pre-excavation survey to mark the excavation boundaries.
Excavation	<ul style="list-style-type: none"> Alternative 3 will be accomplished using standard mechanized heavy equipment such as backhoes, excavators, loaders, and end-dump trucks. The total excavation volume is expected to be 62 cubic yards with a 30 percent bulk factor from RI sub-grid cell 1E. Dust suppression measures will be employed as needed. Erosion and stormwater controls will be applied under this alternative to prevent offsite migration of contaminants and redirect water in the irrigation canal until completion of the removal action. The excavated soil will be stored in containers, dump trucks, or stockpiled over 40 mil high-density polyethylene liners, and soil samples would be collected and profiled. The excavated soil will be disposed of offsite based on profiling results. Appropriate stormwater pollution prevention and inspections of the stockpiles or containers will be implemented during the excavation activities.
Post-Excavation Confirmation Sampling	<ul style="list-style-type: none"> Confirmation soil samples will be collected from the bottom and sidewalls of the excavation areas. Confirmation soil samples for laboratory analysis would be collected using hand methods (e.g., shovel, incremental sampling tool, slide hammer, and hand auguring, and will be analyzed for lead.

Table B-3. Cost Estimate Assumptions

Components	Assumptions
Transportation, Treatment and Disposal of Contaminated Soil	<ul style="list-style-type: none">Excavated soil would be transported by truck to a Class I hazardous waste landfill (assumes soil is classified as hazardous waste).
Site Restoration	<ul style="list-style-type: none">Excavation will be backfilled with clean material to match the existing grade and compacted to meet local or state requirements.
Reporting	<ul style="list-style-type: none">A Removal Action Completion Report, including site closeout documentation, will be prepared documenting the excavation, sampling, backfilling, compaction, disposal, and restoration activities for Alternative 3.

Notes:

CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act

IC = Institutional Control

NCP = National Oil and Hazardous Substance Pollution Contingency Plan

O&M = operation and maintenance

RAWP = removal action work plan

Table B-4. Cost Estimate Details for Alternative 2
Institutional Controls

Technology Name	Fiscal Year 1 2022	Fiscal Year 2 2023	Fiscal Year 3 2024	Fiscal Year 4 2025	Fiscal Year 5 2026	Fiscal Year 6 2027	Fiscal Year 7 2028	Fiscal Year 8 2029	Fiscal Year 9 2030	Fiscal Year 10 2031	Fiscal Year 11 2032	Fiscal Year 12 2033	Fiscal Year 13 2034	Fiscal Year 14 2035	Fiscal Year 15 2036	Fiscal Year 16 2037	Fiscal Year 17 2038
Capital Cost																	
Development and Implementation of ICs	\$ 136,000																
Reporting																	
Land use control implementation plan		\$ 123,000															
O&M																	
IC Compliance Monitoring Reports			\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000
Five-Year Reviews							\$ 28,000					\$ 28,000					\$ 28,000
IC Modification																	
Subtotal (with markups)	\$ 136,000	\$ 123,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 38,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 38,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 38,000
Contingency (20%)	\$ 27,200	\$ 24,600	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 7,600	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 7,600	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 7,600
Subtotal (with contingency and markups)	\$ 163,200	\$ 147,600	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 45,600	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 45,600	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 45,600
Escalation	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Cost	\$ 163,200	\$ 147,600	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 45,600	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 45,600	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 45,600
NET PRESENT VALUE FACTOR ¹	1.000000	0.985222	0.970662	0.956317	0.942184	0.928260	0.914542	0.901027	0.887711	0.874592	0.861667	0.848933	0.836387	0.824027	0.811849	0.799852	0.788031
NET PRESENT VALUE	\$ 163,200	\$ 145,419	\$ 11,648	\$ 11,476	\$ 11,306	\$ 11,139	\$ 41,703	\$ 10,812	\$ 10,653	\$ 10,495	\$ 10,340	\$ 38,711	\$ 10,037	\$ 9,888	\$ 9,742	\$ 9,598	\$ 35,934

Notes:

¹ The net present value of future cash flows was calculated using a real discount rate of 1.5 percent per year (adjusted for inflation) from Office of Management and Budget Circular A-94 Appendix C, revised November 2018.

IC = Institutional Control
O&M = operations and maintenance

Table B-4. Cost Estimate Details for Alternative 2
Institutional Controls

Technology Name	Fiscal Year 18 2039	Fiscal Year 19 2040	Fiscal Year 20 2041	Fiscal Year 21 2042	Fiscal Year 22 2043	Fiscal Year 23 2044	Fiscal Year 24 2045	Fiscal Year 25 2046	Fiscal Year 26 2047	Fiscal Year 27 2048	Fiscal Year 28 2049	Fiscal Year 29 2050	Fiscal Year 30 2051	Fiscal Year 31 2052	Fiscal Year 32 2053	Fiscal Year 33 2054	Row Total
Capital Cost																	
Development and Implementation of ICs																	\$ 136,000
Reporting																	
Land use control implementation plan																	\$ 123,000
O&M																	
IC Compliance Monitoring Reports	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000		\$ 300,000
Five-Year Reviews					\$ 28,000					\$ 28,000					\$ 28,000		\$ 168,000
IC Modification																\$ 39,000	\$ 39,000
Subtotal (with markups)	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 38,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 38,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 38,000	\$ 39,000	\$ 766,000
Contingency (20%)	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 7,600	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 7,600	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 7,600	\$ 7,800	\$ 153,000
Subtotal (with contingency and markups)	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 45,600	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 45,600	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 45,600	\$ 46,800	\$ 919,000
Escalation	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Cost	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 45,600	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 45,600	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 45,600	\$ 46,800	\$ 919,000
NET PRESENT VALUE FACTOR ¹	0.776385	0.764912	0.753607	0.742470	0.731498	0.720688	0.710037	0.699544	0.689206	0.679021	0.668986	0.659099	0.649359	0.639762	0.630308	0.620993	
NET PRESENT VALUE	\$ 9,317	\$ 9,179	\$ 9,043	\$ 8,910	\$ 33,356	\$ 8,648	\$ 8,520	\$ 8,395	\$ 8,270	\$ 30,963	\$ 8,028	\$ 7,909	\$ 7,792	\$ 7,677	\$ 28,742	\$ 29,062	\$ 776,000

Notes:

¹ The net present value of future cash flows was calculated using a real discount rate of 1.5 percent per year (adjusted for inflation) from Office of Management and Budget Circular A-94 Appendix C, revised November 2018.

IC = Institutional Control
O&M = operations and maintenance

Table B-5. Cost Estimate Details for Alternative 3 - Excavation and Offsite Disposal

Technology Name	Fiscal Year 1 2022	Fiscal Year 2 2023	Fiscal Year 3 2024	Row Total
Capital Cost				
Biological Survey and Monitoring	\$ 40,000	\$ 6,000		\$ 46,000
Remedial Design				
Remedial Design and Remedial Action Work Plan	\$ 6,000			\$ 6,000
Site Preparation		\$ 16,000		\$ 16,000
Excavation		\$ 51,000		\$ 51,000
Excavation				
Surface Restoration				
Erosion and Stormwater Controls		\$ 5,000		\$ 5,000
Hazardous Waste Handling and Disposal		\$ 17,000		\$ 17,000
Remedial Action Completion Report			\$ 39,000	\$ 39,000
Subtotal (with markups)	\$ 46,000	\$ 95,000	\$ 39,000	\$ 180,000
Contingency (20%)	\$ 9,200	\$ 19,000	\$ 7,800	\$ 36,000
Subtotal (with contingency and markups)	\$ 55,200	\$ 114,000	\$ 46,800	\$ 216,000
Escalation	\$ -	\$ -	\$ -	\$ -
Total Cost	\$ 55,200	\$ 114,000	\$ 46,800	\$ 216,000
NET PRESENT VALUE FACTOR ¹	1.000000	0.985221675	0.970661749	
NET PRESENT VALUE	\$ 55,200	\$ 112,315.27	\$ 45,426.97	\$ 213,000

Note:

1 The net present value of future cash flows was calculated using a real discount rate of 1.5 percent per year (adjusted for inflation) from Office of Management and Budget Circular A-94 Appendix C, revised November 2018.

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Attachment B1

Alternative 2 RACER Cost Details Reports

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Phase Technology Cost Detail Report (with Markups)

System:

RACER Version: RACER® Version 11.4.63.0

Database Location: C:\Users\mw029968\Documents\Estimates\Navy\NAF El Centro\Racer MCAS El Centro
11-2019.mdb

Folder:

Folder Name: NAF El Centro

Project:

ID: NAF El Centro MRP Site 02

Name: NAF El Centro MRP Site 02

Category: None

Location

State / Country: CALIFORNIA

City: EL CENTRO

Location Modifier

Default

1.220

User

1.240

Reason for changes

Updated to use 2019 ACFs
DOD AREA COST FACTORS (ACF) PAX
Newsletter No 3.2.1, Dated 16 May 2019
TABLE 4-1, UFC 3-701-01

Options

Database: Modified System Costs

Cost Database Date: 2017

Report Option: Fiscal

Description FS for NAF El Centro MRP Site 02

Site:

ID: NAF El Centro MRP Site 02 Alt 2
Name: NAF El Centro MRP Site 02 Alternative 2 Institutional Controls
Type: None

Media/Waste Type
Primary: Soil
Secondary: N/A

Contaminant
Primary: Metals
Secondary: None

Phase Names
Pre-Study
Study
Design
Removal/Interim Action
Remedial Action
Operations & Maintenance
Long Term Monitoring
Site Closeout

Documentation
Description: Naval Air Facility El Centro
1. Alternative 2 – Institutional Controls (ICs)
a. Development and Implementation of Institutional controls (ICs)
b. Annual Inspections and Reporting

Support Team: Darcey Hernandez SCO
Melissa Rendon SCO
Mariella Coquia SCO
Betsy Collins RAL

References: MRP_Site2_Alternatives.docx
MRP04_FS_Fig3-1_008_1379.pdf
MRP04_FS_Fig3-2_008_1380.pdf

Estimator Information

Estimator Name: Mike West
Estimator Title: Estimating Professional 4
Agency/Org./Office: Jacobs
Business Address: 9191 South Jamaica Street
Englewood, CO 80112
Telephone Number: 720-428-1506
Email Address: Mike.West@jacobs.com
Estimate Prepared Date: 04/02/2020

Estimator Signature: _____

Date: _____

Reviewer Information

Reviewer Name: Darcey Hernandez
Reviewer Title: Engineer
Agency/Org./Office: Jacobs
Business Address: SCO
Telephone Number:
Email Address:
Date Reviewed: 04/02/2020

Reviewer Signature: _____

Date: _____

Phase Documentation:

Phase Type: Long Term Monitoring
Phase Name: MRP Site 2 Alt 2 Five Year Reviews FY2028-FY2053
Description: NAF El Centro MRP Site 2 Alt 2 Five Year Reviews FY2028-FY2053
Approach: Ex Situ
Start Date: October, 2027
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate
Phase Markup Template: System Defaults

<u>Technology Markups</u>	<u>Markup</u>	<u>% Prime</u>	<u>% Sub.</u>
Five-Year Review	True	100	0

Total Marked-up Cost: \$170,553.94

Technologies:

Technology: Five-Year Review

Element: Document Review

Unit of Assembly	Description	Quantity	Material Measure	Labor Unit Cost	Unit Equipment Cost	Sub Bid Unit Cost	Cost Cost	Extended Cost	Override
33220102	Project Manager	8.00	HR	0.00	359.20	0.00	0.00	\$2,873.62	False
33220105	Project Engineer	5.00	HR	0.00	248.09	0.00	0.00	\$1,240.43	False

Technology: Five-Year Review

33220108	Project Scientist	4.00	HR	0.00	270.11	0.00	0.00	\$1,080.45	False
33220109	Staff Scientist	8.00	HR	0.00	218.15	0.00	0.00	\$1,745.16	False

Total Element Cost: \$6,939.65

Element: Interviews

Unit of Assembly	Description	Quantity	Material Measure	Labor Unit Cost	Unit Equipment Cost	Sub Bid Unit Cost	Cost Cost	Extended Cost	Override
33220102	Project Manager	5.00	HR	0.00	359.20	0.00	0.00	\$1,796.01	False

Total Element Cost: \$1,796.01

Element: Site Inspection

Unit of Assembly	Description	Quantity	Material Measure	Labor Unit Cost	Unit Equipment Cost	Sub Bid Unit Cost	Cost Cost	Extended Cost	Override
33220102	Project Manager	4.00	HR	0.00	359.20	0.00	0.00	\$1,436.81	False
33220105	Project Engineer	4.00	HR	0.00	248.09	0.00	0.00	\$992.34	False
33220108	Project Scientist	4.00	HR	0.00	270.11	0.00	0.00	\$1,080.45	False
33220109	Staff Scientist	4.00	HR	0.00	218.15	0.00	0.00	\$872.58	False

Total Element Cost: \$4,382.18

Element: Report

Unit of Assembly	Description	Quantity	Material Measure	Labor Unit Cost	Unit Equipment Cost	Sub Bid Unit Cost	Cost Cost	Extended Cost	Override
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Print Date:4/2/2020 7:55:40 PM

Technology: Five-Year Review

33220102	Project Manager	6.00	HR	0.00	359.20	0.00	0.00	\$2,155.21	False
33220105	Project Engineer	16.00	HR	0.00	248.09	0.00	0.00	\$3,969.38	False
33220108	Project Scientist	13.00	HR	0.00	270.11	0.00	0.00	\$3,511.45	False
33220109	Staff Scientist	26.00	HR	0.00	218.15	0.00	0.00	\$5,671.78	False

Total Element Cost: \$15,307.81

Total 1st Year Tech Cost: \$28,425.66

Total Phase Element Cost \$28,425.66

Phase Technology Cost Detail Report (with Markups)

System:

RACER Version: RACER® Version 11.4.63.0

Database Location: C:\Users\mw029968\Documents\Estimates\Navy\NAF El Centro\Racer MCAS El Centro
11-2019.mdb

Folder:

Folder Name: NAF El Centro

Project:

ID: NAF El Centro MRP Site 02

Name: NAF El Centro MRP Site 02

Category: None

Location

State / Country: CALIFORNIA

City: EL CENTRO

Location Modifier

Default

1.220

User

1.240

Reason for changes

Updated to use 2019 ACFs
DOD AREA COST FACTORS (ACF) PAX
Newsletter No 3.2.1, Dated 16 May 2019
TABLE 4-1, UFC 3-701-01

Options

Database: Modified System Costs

Cost Database Date: 2017

Report Option: Fiscal

Print Date:4/2/2020 7:55:22 PM

Description FS for NAF El Centro MRP Site 02

Site:

ID: NAF El Centro MRP Site 02 Alt 2
Name: NAF El Centro MRP Site 02 Alternative 2 Institutional Controls
Type: None

Media/Waste Type
Primary: Soil
Secondary: N/A

Contaminant
Primary: Metals
Secondary: None

Phase Names
Pre-Study
Study
Design
Removal/Interim Action
Remedial Action
Operations & Maintenance
Long Term Monitoring
Site Closeout

Documentation
Description: Naval Air Facility El Centro
1. Alternative 2 – Institutional Controls (ICs)
a. Development and Implementation of Institutional controls (ICs)
b. Annual Inspections and Reporting

Support Team: Darcey Hernandez SCO
Melissa Rendon SCO
Mariella Coquia SCO
Betsy Collins RAL

References: MRP_Site2_Alternatives.docx
MRP04_FS_Fig3-1_008_1379.pdf
MRP04_FS_Fig3-2_008_1380.pdf

Estimator Information

Estimator Name: Mike West

Estimator Title: Estimating Professional 4

Agency/Org./Office: Jacobs

Business Address: 9191 South Jamaica Street
Englewood, CO 80112

Telephone Number: 720-428-1506

Email Address: Mike.West@jacobs.com

Estimate Prepared Date: 04/02/2020

Estimator Signature: _____

Date: _____

Reviewer Information

Reviewer Name: Darcey Hernandez

Reviewer Title: Engineer

Agency/Org./Office: Jacobs

Business Address: SCO

Telephone Number:

Email Address:

Date Reviewed: 04/02/2020

Reviewer Signature: _____

Date: _____

Phase Documentation:

Phase Type: Long Term Monitoring
Phase Name: MRP Site 2 Alt 2 LUC Annual Inspections and Reporting FY2024-FY2053
Description: NAF El Centro MRP Site 2 Alt 2 Land Use Control Annual Inspections and Reporting FY2024-FY2053

Approach: Ex Situ
Start Date: October, 2023
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate
Phase Markup Template: System Defaults

<u>Technology Markups</u>	<u>Markup</u>	<u>% Prime</u>	<u>% Sub.</u>
LUCs - Annual Inspections and Reporting	True	100	0

Total Marked-up Cost: \$308,429.63

Technologies:

Technology: LUCs - Annual Inspections and Reporting

Element: Monitoring & Enforcement

Unit of Assembly	Description	Quantity	Material Measure	Labor Unit Cost	Unit Equipment Cost	Sub Bid Unit Cost	Cost Cost	Extended Cost	Override
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33010104	Sample collection, vehicle mileage charge, car or van	115.00	MI	0.00	0.00	0.00	0.56	\$64.40	True
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Technology: LUCs - Annual Inspections and Reporting

33010202	Per Diem (per person)	5.00	DAY	0.00	0.00	0.00	140.00	\$700.00	True
33022038	Overnight delivery service, 1 lb package	6.00	LB	0.00	0.00	0.00	77.89	\$467.36	False
33220102	Project Manager	4.00	HR	0.00	359.20	0.00	0.00	\$1,436.81	False
33220106	Staff Engineer	12.00	HR	0.00	326.64	0.00	0.00	\$3,919.65	False
33220110	QA/QC Officer	4.00	HR	0.00	210.03	0.00	0.00	\$840.11	False
33220112	Field Technician	1.00	HR	0.00	165.58	0.00	0.00	\$165.58	False
33220114	Word Processing/Clerical	4.00	HR	0.00	168.12	0.00	0.00	\$672.46	False
33220115	Draftsman/CADD	4.00	HR	0.00	131.15	0.00	0.00	\$524.61	False
33220119	Health and Safety Officer	4.00	HR	0.00	270.84	0.00	0.00	\$1,083.37	False
33240101	Other Direct Costs	1.00	LS	406.65	0.00	0.00	0.00	\$406.65	True

Total Element Cost: \$10,280.99

Total 1st Year Tech Cost: \$10,280.99

Total Phase Element Cost \$10,280.99

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Phase Technology Cost Detail Report (with Markups)

System:

RACER Version: RACER® Version 11.4.63.0

Database Location: C:\Users\mw029968\Documents\Estimates\Navy\NAF El Centro\Racer MCAS El Centro
11-2019.mdb

Folder:

Folder Name: NAF El Centro

Project:

ID: NAF El Centro MRP Site 02

Name: NAF El Centro MRP Site 02

Category: None

Location

State / Country: CALIFORNIA

City: EL CENTRO

Location Modifier

Default

1.220

User

1.240

Reason for changes

Updated to use 2019 ACFs
DOD AREA COST FACTORS (ACF) PAX
Newsletter No 3.2.1, Dated 16 May 2019
TABLE 4-1, UFC 3-701-01

Options

Database: Modified System Costs

Cost Database Date: 2017

Report Option: Fiscal

Description FS for NAF El Centro MRP Site 02

Site:

ID: NAF El Centro MRP Site 02 Alt 2
Name: NAF El Centro MRP Site 02 Alternative 2 Institutional Controls
Type: None

Media/Waste Type
Primary: Soil
Secondary: N/A

Contaminant
Primary: Metals
Secondary: None

- Phase Names**
- Pre-Study
 - Study
 - Design
 - Removal/Interim Action
 - Remedial Action
 - Operations & Maintenance
 - Long Term Monitoring
 - Site Closeout

Documentation
Description: Naval Air Facility El Centro

- 1. Alternative 2 – Institutional Controls (ICs)
- a. Development and Implementation of Institutional controls (ICs)
- b. Annual Inspections and Reporting

Support Team: Darcey Hernandez SCO
Melissa Rendon SCO
Mariella Coquia SCO
Betsy Collins RAL

References: MRP_Site2_Alternatives.docx
MRP04_FS_Fig3-1_008_1379.pdf
MRP04_FS_Fig3-2_008_1380.pdf

Estimator Information

Estimator Name: Mike West

Estimator Title: Estimating Professional 4

Agency/Org./Office: Jacobs

Business Address: 9191 South Jamaica Street
Englewood, CO 80112

Telephone Number: 720-428-1506

Email Address: Mike.West@jacobs.com

Estimate Prepared Date: 04/02/2020

Estimator Signature: _____

Date: _____

Reviewer Information

Reviewer Name: Darcey Hernandez

Reviewer Title: Engineer

Agency/Org./Office: Jacobs

Business Address: SCO

Telephone Number:

Email Address:

Date Reviewed: 04/02/2020

Reviewer Signature: _____

Date: _____

Phase Documentation:

Phase Type: Remedial Action
Phase Name: MRP Site 2 Alt 2 Land Use Controls Design FY2022
Description: NAF El Centro MRP Site 2 Alt 2 Land Use Control Design FY2022
Approach: Ex Situ
Start Date: October, 2021
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate
Phase Markup Template: System Defaults

<u>Technology Markups</u>	<u>Markup</u>	<u>% Prime</u>	<u>% Sub.</u>
MRP Site 2 LUC Design	True	100	0

Total Marked-up Cost: \$117,335.05

Technologies:

Technology: MRP Site 2 LUC Design

Element: Planning Docs

Unit of Assembly	Description	Quantity	Material Measure	Labor Unit Cost	Unit Equipment Cost	Sub Bid Unit Cost	Cost Cost	Extended Cost	Override
33220102	Project Manager	37.00	HR	0.00	294.55	0.00	0.00	\$10,898.19	False
33220105	Project Engineer	90.00	HR	0.00	203.43	0.00	0.00	\$18,308.75	False

Technology: MRP Site 2 LUC Design

33220106	Staff Engineer	165.00	HR	0.00	267.84	0.00	0.00	\$44,194.02	False
33220110	QA/QC Officer	28.00	HR	0.00	210.03	0.00	0.00	\$5,880.75	False
33220114	Word Processing/Clerical	150.00	HR	0.00	137.85	0.00	0.00	\$20,678.16	False
33220115	Draftsman/CADD	68.00	HR	0.00	131.15	0.00	0.00	\$8,918.35	False
33220503	Attorney, Partner, Real Estate	22.00	HR	0.00	311.70	0.00	0.00	\$6,857.32	False
33240101	Other Direct Costs	1.00	LS	1,599.51	0.00	0.00	0.00	\$1,599.51	True

Total Element Cost: \$117,335.05

Element: Planning Meetings

Unit of Assembly	Description	Quantity	Material Measure	Labor Unit Unit Cost	Equipment Cost	Sub Bid Unit Cost	Cost Cost	Extended Cost	Override
33240101	Other Direct Costs	1.00	LS	0.00	0.00	0.00	0.00	\$0.00	True

Total Element Cost: \$0.00

Total 1st Year Tech Cost: \$117,335.05

Total Phase Element Cost \$117,335.05

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Phase Technology Cost Detail Report (with Markups)

System:

RACER Version: RACER® Version 11.4.63.0

Database Location: C:\Users\mw029968\Documents\Estimates\Navy\NAF El Centro\Racer MCAS El Centro
11-2019.mdb

Folder:

Folder Name: NAF El Centro

Project:

ID: NAF El Centro MRP Site 02

Name: NAF El Centro MRP Site 02

Category: None

Location

State / Country: CALIFORNIA

City: EL CENTRO

Location Modifier

Default

1.220

User

1.240

Reason for changes

Updated to use 2019 ACFs
DOD AREA COST FACTORS (ACF) PAX
Newsletter No 3.2.1, Dated 16 May 2019
TABLE 4-1, UFC 3-701-01

Options

Database: Modified System Costs

Cost Database Date: 2017

Report Option: Fiscal

Description FS for NAF El Centro MRP Site 02

Site:

ID: NAF El Centro MRP Site 02 Alt 2
Name: NAF El Centro MRP Site 02 Alternative 2 Institutional Controls
Type: None

Media/Waste Type
Primary: Soil
Secondary: N/A

Contaminant
Primary: Metals
Secondary: None

Phase Names
Pre-Study
Study
Design
Removal/Interim Action
Remedial Action
Operations & Maintenance
Long Term Monitoring
Site Closeout

Documentation
Description: Naval Air Facility El Centro
1. Alternative 2 – Institutional Controls (ICs)
a. Development and Implementation of Institutional controls (ICs)
b. Annual Inspections and Reporting

Support Team: Darcey Hernandez SCO
Melissa Rendon SCO
Mariella Coquia SCO
Betsy Collins RAL

References: MRP_Site2_Alternatives.docx
MRP04_FS_Fig3-1_008_1379.pdf
MRP04_FS_Fig3-2_008_1380.pdf

Estimator Information

Estimator Name: Mike West

Estimator Title: Estimating Professional 4

Agency/Org./Office: Jacobs

Business Address: 9191 South Jamaica Street
Englewood, CO 80112

Telephone Number: 720-428-1506

Email Address: Mike.West@jacobs.com

Estimate Prepared Date: 04/02/2020

Estimator Signature: _____

Date: _____

Reviewer Information

Reviewer Name: Darcey Hernandez

Reviewer Title: Engineer

Agency/Org./Office: Jacobs

Business Address: SCO

Telephone Number:

Email Address:

Date Reviewed: 04/02/2020

Reviewer Signature: _____

Date: _____

Phase Documentation:

Phase Type: Remedial Action
Phase Name: MRP Site 2 Alt 2 Land Use Controls Implementation FY2023
Description: NAF El Centro MRP Site 2 Alt 2 Land Use Controls Implementation FY2023
Approach: Ex Situ
Start Date: October, 2022
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate
Phase Markup Template: System Defaults

<u>Technology Markups</u>	<u>Markup</u>	<u>% Prime</u>	<u>% Sub.</u>
MRP Site 2 Alt 2 Land Use Controls Implementation	True	100	0

Total Marked-up Cost: \$122,720.14

Technologies:

Technology: MRP Site 2 Alt 2 Land Use Controls Implementation

Element: Implementation

Unit of Assembly	Description	Quantity	Material Measure	Labor Unit Cost	Unit Equipment Cost	Sub Bid Unit Cost	Cost Cost	Extended Cost	Override
18010412	Construction Signs	90.00	SF	46.27	0.00	0.00	0.00	\$4,164.09	False
33220102	Project Manager	30.00	HR	0.00	294.55	0.00	0.00	\$8,836.37	False

Technology: MRP Site 2 Alt 2 Land Use Controls Implementation

33220105	Project Engineer	90.00	HR	0.00	203.43	0.00	0.00	\$18,308.75	False
33220106	Staff Engineer	105.00	HR	0.00	267.84	0.00	0.00	\$28,123.47	False
33220110	QA/QC Officer	26.00	HR	0.00	210.03	0.00	0.00	\$5,460.70	False
33220114	Word Processing/Clerical	90.00	HR	0.00	137.85	0.00	0.00	\$12,406.90	False
33220115	Draftsman/CADD	188.00	HR	0.00	131.15	0.00	0.00	\$24,656.61	False
33220120	Computer Data Entry	150.00	HR	0.00	128.19	0.00	0.00	\$19,228.36	False
33240101	Other Direct Costs	1.00	LS	1,534.89	0.00	0.00	0.00	\$1,534.89	True

Total Element Cost: \$122,720.14

Total 1st Year Tech Cost: \$122,720.14

Total Phase Element Cost \$122,720.14

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Phase Technology Cost Detail Report (with Markups)

System:

RACER Version: RACER® Version 11.4.63.0

Database Location: C:\Users\mw029968\Documents\Estimates\Navy\NAF El Centro\Racer MCAS El Centro
11-2019.mdb

Folder:

Folder Name: NAF El Centro

Project:

ID: NAF El Centro MRP Site 02

Name: NAF El Centro MRP Site 02

Category: None

Location

State / Country: CALIFORNIA

City: EL CENTRO

Location Modifier

Default

1.220

User

1.240

Reason for changes

Updated to use 2019 ACFs
DOD AREA COST FACTORS (ACF) PAX
Newsletter No 3.2.1, Dated 16 May 2019
TABLE 4-1, UFC 3-701-01

Options

Database: Modified System Costs

Cost Database Date: 2017

Report Option: Fiscal

Description FS for NAF El Centro MRP Site 02

Site:

ID: NAF El Centro MRP Site 02 Alt 2
Name: NAF El Centro MRP Site 02 Alternative 2 Institutional Controls
Type: None

Media/Waste Type

Primary: Soil
Secondary: N/A

Contaminant

Primary: Metals
Secondary: None

Phase Names

Pre-Study
Study
Design
Removal/Interim Action
Remedial Action
Operations & Maintenance
Long Term Monitoring
Site Closeout

Documentation

Description: Naval Air Facility El Centro
1. Alternative 2 – Institutional Controls (ICs)
a. Development and Implementation of Institutional controls (ICs)
b. Annual Inspections and Reporting

Support Team: Darcey Hernandez SCO
Melissa Rendon SCO
Mariella Coquia SCO
Betsy Collins RAL

References: MRP_Site2_Alternatives.docx
MRP04_FS_Fig3-1_008_1379.pdf
MRP04_FS_Fig3-2_008_1380.pdf

Estimator Information

Estimator Name: Mike West
Estimator Title: Estimating Professional 4
Agency/Org./Office: Jacobs
Business Address: 9191 South Jamaica Street
Englewood, CO 80112
Telephone Number: 720-428-1506
Email Address: Mike.West@jacobs.com
Estimate Prepared Date: 04/02/2020

Estimator Signature: _____

Date: _____

Reviewer Information

Reviewer Name: Darcey Hernandez
Reviewer Title: Engineer
Agency/Org./Office: Jacobs
Business Address: SCO
Telephone Number:
Email Address:
Date Reviewed: 04/02/2020

Reviewer Signature: _____

Date: _____

Phase Documentation:

Phase Type: Site Closeout
Phase Name: MRP Site 2 Alt 2 LUC Modification FY2054
Description: MRP Site 2 Alternative 2 Land Use Controls Modification

Approach: Ex Situ
Start Date: October, 2053
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markup Template: System Defaults

<u>Technology Markups</u>	<u>Markup</u>	<u>% Prime</u>	<u>% Sub.</u>
Administrative Land Use Controls Modification	True	100	0

Total Marked-up Cost: \$39,476.69

Technologies:

Technology: Administrative Land Use Controls Modification

Element: Modification/Termination

Unit of Assembly	Description	Quantity	Material Measure	Labor Unit Cost	Unit Equipment Cost	Sub Bid Unit Cost	Cost Cost	Extended Cost	Override
33220102	Project Manager	12.00	HR	0.00	294.55	0.00	0.00	\$3,534.55	False
33220104	Senior Staff Engineer	6.00	HR	0.00	317.44	0.00	0.00	\$1,904.63	False

Technology: Administrative Land Use Controls Modification

33220105	Project Engineer	62.00	HR	0.00	203.43	0.00	0.00	\$12,612.69	False
33220106	Staff Engineer	60.00	HR	0.00	267.84	0.00	0.00	\$16,070.55	False
33220110	QA/QC Officer	10.00	HR	0.00	210.03	0.00	0.00	\$2,100.27	False
33220114	Word Processing/Clerical	5.00	HR	0.00	137.85	0.00	0.00	\$689.27	False
33220115	Draftsman/CADD	16.00	HR	0.00	131.15	0.00	0.00	\$2,098.44	False
33240101	Other Direct Costs	1.00	LS	466.28	0.00	0.00	0.00	\$466.28	True

Total Element Cost: \$39,476.69

Total 1st Year Tech Cost: \$39,476.69

Total Phase Element Cost \$39,476.69

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Attachment B2

Alternative 3 RACER Cost Details Reports

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Phase Technology Cost Detail Report (with Markups)

System:

RACER Version: RACER® Version 11.4.63.0

Database Location: C:\Users\mw029968\Documents\Estimates\Navy\NAF El Centro\Racer MCAS El Centro
11-2019.mdb

Folder:

Folder Name: NAF El Centro

Project:

ID: NAF El Centro MRP Site 02

Name: NAF El Centro MRP Site 02

Category: None

Location

State / Country: CALIFORNIA

City: EL CENTRO

Location Modifier

Default

1.220

User

1.240

Reason for changes

Updated to use 2019 ACFs
DOD AREA COST FACTORS (ACF) PAX
Newsletter No 3.2.1, Dated 16 May 2019
TABLE 4-1, UFC 3-701-01

Options

Database: Modified System Costs

Cost Database Date: 2017

Report Option: Fiscal

Description FS for NAF El Centro MRP Site 02

Site:

ID: NAF El Centro MRP Site 02 Alt 3
Name: NAF El Centro MRP Site 02 Alternative 3 Excavation and Offsite Disposal
Type: None

Media/Waste Type
Primary: Soil
Secondary: N/A

Contaminant
Primary: Metals
Secondary: None

Phase Names
Pre-Study
Study
Design
Removal/Interim Action
Remedial Action
Operations & Maintenance
Long Term Monitoring
Site Closeout

Documentation
Description: Naval Air Facility El Centro
5. Alternative 5 – Excavation and Offsite Disposal
a. Remedial design
b. Biological survey and monitoring
c. Site preparation
d. Excavation
e. Confirmation soil sampling
f. Reporting

Support Team: Darcey Hernandez SCO
Melissa Rendon SCO
Mariella Coquia SCO
Betsy Collins RAL

References: MRP_Site2_Alternatives.docx
Figure 4-1.pdf

Estimator Information

Estimator Name: Mike West

Estimator Title: Estimating Professional 4

Agency/Org./Office: Jacobs

Business Address: 9191 South Jamaica Street
Englewood, CO 80112

Telephone Number: 720-428-1506

Email Address: Mike.West@jacobs.com

Estimate Prepared Date: 11/17/2019

Estimator Signature: _____

Date: _____

Reviewer Information

Reviewer Name: Darcey Hernandez

Reviewer Title: Engineer

Agency/Org./Office: Jacobs

Business Address: SCO

Telephone Number:

Email Address:

Date Reviewed: 11/17/2019

Reviewer Signature: _____

Date: _____

Phase Documentation:

Phase Type: Study
Phase Name: MRP Site 2 Alt 3 Biological Survey and Monitoring FY2022
Description: MRP Site 2 Alt 3 Biological Survey and Monitoring FY2022
 Used the Remedial Investigation model and selected Evaluate Site Ecology for Site Characterization.
Approach: Ex Situ
Start Date: October, 2021
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate
Phase Markup Template: System Defaults

<u>Technology Markups</u>	<u>Markup</u>	<u>% Prime</u>	<u>% Sub.</u>
Remedial Investigation	True	100	0

Total Marked-up Cost: \$6,463.37

Technologies:

Technology: Remedial Investigation

Element: Site Characterization

Unit of Assembly	Description	Quantity	Material Measure	Labor Unit Cost	Unit Equipment Cost	Sub Bid Unit Cost	Cost Cost	Extended Cost	Override
33010102	Sample collection, vehicles, van	2.00	DAY	0.00	0.00	0.00	106.29	\$212.57	False

Technology: Remedial Investigation

or pickup rental									
33220102	Project Manager	1.00	HR	0.00	359.20	0.00	0.00	\$359.20	False
33220109	Staff Scientist	24.00	HR	0.00	218.15	0.00	0.00	\$5,235.49	False
33220114	Word Processing/Clerical	2.00	HR	0.00	168.12	0.00	0.00	\$336.23	False
33220115	Draftsman/CADD	2.00	HR	0.00	159.94	0.00	0.00	\$319.88	False

Total Element Cost: \$6,463.37

Total 1st Year Tech Cost: \$6,463.37

Total Phase Element Cost \$6,463.37

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Phase Technology Cost Detail Report (with Markups)

System:

RACER Version: RACER® Version 11.4.63.0

Database Location: C:\Users\mw029968\Documents\Estimates\Navy\NAF El Centro\Racer MCAS El Centro
11-2019.mdb

Folder:

Folder Name: NAF El Centro

Project:

ID: NAF El Centro MRP Site 02

Name: NAF El Centro MRP Site 02

Category: None

Location

State / Country: CALIFORNIA

City: EL CENTRO

Location Modifier

Default

1.220

User

1.240

Reason for changes

Updated to use 2019 ACFs
DOD AREA COST FACTORS (ACF) PAX
Newsletter No 3.2.1, Dated 16 May 2019
TABLE 4-1, UFC 3-701-01

Options

Database: Modified System Costs

Cost Database Date: 2017

Report Option: Fiscal

Description

FS for NAF El Centro MRP Site 02

Site:

ID: NAF El Centro MRP Site 02 Alt 3

Name: NAF El Centro MRP Site 02 Alternative 3 Excavation and Offsite Disposal

Type: None

Media/Waste Type

Primary: Soil

Secondary: N/A

Contaminant

Primary: Metals

Secondary: None

Phase Names

Pre-Study

Study

Design

Removal/Interim Action

Remedial Action

Operations & Maintenance

Long Term Monitoring

Site Closeout

Documentation

Description: Naval Air Facility El Centro

5. Alternative 5 – Excavation and Offsite Disposal
 - a. Remedial design
 - b. Biological survey and monitoring
 - c. Site preparation
 - d. Excavation
 - e. Confirmation soil sampling
 - f. Reporting

Support Team: Darcey Hernandez SCO
Melissa Rendon SCO
Mariella Coquia SCO
Betsy Collins RAL

References: MRP_Site2_Alternatives.docx
Figure 4-1.pdf

Estimator Information

Estimator Name: Mike West

Estimator Title: Estimating Professional 4

Agency/Org./Office: Jacobs

Business Address: 9191 South Jamaica Street
Englewood, CO 80112

Telephone Number: 720-428-1506

Email Address: Mike.West@jacobs.com

Estimate Prepared Date: 11/17/2019

Estimator Signature: _____

Date: _____

Reviewer Information

Reviewer Name: Darcey Hernandez

Reviewer Title: Engineer

Agency/Org./Office: Jacobs

Business Address: SCO

Telephone Number:

Email Address:

Date Reviewed: 11/17/2019

Reviewer Signature: _____

Date: _____

Phase Documentation:

Phase Type: Design
Phase Name: MRP Site 2 Alt 3 Excavation Design FY2022
Description: MRP Site 2 Alt 3 Excavation Design FY2022
Prepare Remedial Design documents for excavation all impacted areas
Approach: Ex Situ
Start Date: October, 2021
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate
Phase Markup Template: System Defaults

<u>Technology Markups</u>	<u>Markup</u>	<u>% Prime</u>	<u>% Sub.</u>
Remedial Design (Percent)	False	0	0

Total Marked-up Cost: \$5,819.00

Technologies:

Technology: Remedial Design (Percent)

Element:

Unit of Assembly	Description	Quantity	Material Measure	Labor Unit Cost	Unit Equipment Cost	Sub Bid Unit Cost	Cost Cost	Extended Cost	Override
32039005	Remedial Design - User Defined Cost	1.00	EA	0.00	5,819.00	0.00	0.00	\$5,819.00	True

Technology: Remedial Design (Percent)

Total Element Cost:	\$5,819.00	
Total 1st Year Tech Cost:	\$5,819.00	
Total Phase Element Cost		\$5,819.00

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Phase Technology Cost Detail Report (with Markups)

System:

RACER Version: RACER® Version 11.4.63.0

Database Location: C:\Users\mw029968\Documents\Estimates\Navy\NAF El Centro\Racer MCAS El Centro
11-2019.mdb

Folder:

Folder Name: NAF El Centro

Project:

ID: NAF El Centro MRP Site 02

Name: NAF El Centro MRP Site 02

Category: None

Location

State / Country: CALIFORNIA

City: EL CENTRO

Location Modifier

Default

1.220

User

1.240

Reason for changes

Updated to use 2019 ACFs
DOD AREA COST FACTORS (ACF) PAX
Newsletter No 3.2.1, Dated 16 May 2019
TABLE 4-1, UFC 3-701-01

Options

Database: Modified System Costs

Cost Database Date: 2017

Report Option: Fiscal

Description FS for NAF El Centro MRP Site 02

Site:

ID: NAF El Centro MRP Site 02 Alt 3
Name: NAF El Centro MRP Site 02 Alternative 3 Excavation and Offsite Disposal
Type: None

Media/Waste Type

Primary: Soil
Secondary: N/A

Contaminant

Primary: Metals
Secondary: None

Phase Names

Pre-Study
Study
Design
Removal/Interim Action
Remedial Action
Operations & Maintenance
Long Term Monitoring
Site Closeout

Documentation

Description: Naval Air Facility El Centro
5. Alternative 5 – Excavation and Offsite Disposal
a. Remedial design
b. Biological survey and monitoring
c. Site preparation
d. Excavation
e. Confirmation soil sampling
f. Reporting

Support Team: Darcey Hernandez SCO
Melissa Rendon SCO
Mariella Coquia SCO
Betsy Collins RAL

References: MRP_Site2_Alternatives.docx
Figure 4-1.pdf

Estimator Information

Estimator Name: Mike West

Estimator Title: Estimating Professional 4

Agency/Org./Office: Jacobs

Business Address: 9191 South Jamaica Street
Englewood, CO 80112

Telephone Number: 720-428-1506

Email Address: Mike.West@jacobs.com

Estimate Prepared Date: 11/17/2019

Estimator Signature: _____

Date: _____

Reviewer Information

Reviewer Name: Darcey Hernandez

Reviewer Title: Engineer

Agency/Org./Office: Jacobs

Business Address: SCO

Telephone Number:

Email Address:

Date Reviewed: 11/17/2019

Reviewer Signature: _____

Date: _____

Phase Documentation:

Phase Type: Site Closeout
Phase Name: MRP Site 2 Alt 3 Remedial Action Completion Report FY2024
Description: MRP Site 2 Alt 3 Remedial Action Completion Report FY2024
1. Prepare an Remedial Action Completion Report (iRACR)

Approach: Ex Situ

Start Date: October, 2023

Labor Rate Group: System Labor Rate

Analysis Rate Group: System Analysis Rate

Phase Markup Template: System Defaults

<u>Technology Markups</u>	<u>Markup</u>	<u>% Prime</u>	<u>% Sub.</u>
Site Close-Out Documentation	True	100	0

Total Marked-up Cost: \$39,317.65

Technologies:

Technology: Site Close-Out Documentation

Element: Work Plans & Reports

Unit of Assembly	Description	Quantity	Material Measure	Labor Unit Cost	Unit Equipment Cost	Sub Bid Unit Cost	Cost Cost	Extended Cost	Override
33220101	Senior Project Manager	13.00	HR	0.00	390.61	0.00	0.00	\$5,077.87	False

Technology: Site Close-Out Documentation

33220102	Project Manager	67.00	HR	0.00	359.20	0.00	0.00	\$24,066.54	False
33220104	Senior Staff Engineer	5.00	HR	0.00	387.12	0.00	0.00	\$1,935.60	False
33220114	Word Processing/Clerical	49.00	HR	0.00	168.12	0.00	0.00	\$8,237.64	False

Total Element Cost: \$39,317.65

Total 1st Year Tech Cost: \$39,317.65

Total Phase Element Cost \$39,317.65

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Phase Technology Cost Detail Report (with Markups)

System:

RACER Version: RACER® Version 11.4.63.0

Database Location: C:\Users\mw029968\Documents\Estimates\Navy\NAF El Centro\Racer MCAS El Centro
11-2019.mdb

Folder:

Folder Name: NAF El Centro

Project:

ID: NAF El Centro MRP Site 02

Name: NAF El Centro MRP Site 02

Category: None

Location

State / Country: CALIFORNIA

City: EL CENTRO

Location Modifier

Default

1.220

User

1.240

Reason for changes

Updated to use 2019 ACFs
DOD AREA COST FACTORS (ACF) PAX
Newsletter No 3.2.1, Dated 16 May 2019
TABLE 4-1, UFC 3-701-01

Options

Database: Modified System Costs

Cost Database Date: 2017

Report Option: Fiscal

Description FS for NAF El Centro MRP Site 02

Site:

ID: NAF El Centro MRP Site 02 Alt 3
Name: NAF El Centro MRP Site 02 Alternative 3 Excavation and Offsite Disposal
Type: None

Media/Waste Type

Primary: Soil
Secondary: N/A

Contaminant

Primary: Metals
Secondary: None

Phase Names

Pre-Study
Study
Design
Removal/Interim Action
Remedial Action
Operations & Maintenance
Long Term Monitoring
Site Closeout

Documentation

Description: Naval Air Facility El Centro
5. Alternative 5 – Excavation and Offsite Disposal
a. Remedial design
b. Biological survey and monitoring
c. Site preparation
d. Excavation
e. Confirmation soil sampling
f. Reporting

Support Team: Darcey Hernandez SCO
Melissa Rendon SCO
Mariella Coquia SCO
Betsy Collins RAL

References: MRP_Site2_Alternatives.docx
Figure 4-1.pdf

Estimator Information

Estimator Name: Mike West

Estimator Title: Estimating Professional 4

Agency/Org./Office: Jacobs

Business Address: 9191 South Jamaica Street
Englewood, CO 80112

Telephone Number: 720-428-1506

Email Address: Mike.West@jacobs.com

Estimate Prepared Date: 11/17/2019

Estimator Signature: _____

Date: _____

Reviewer Information

Reviewer Name: Darcey Hernandez

Reviewer Title: Engineer

Agency/Org./Office: Jacobs

Business Address: SCO

Telephone Number:

Email Address:

Date Reviewed: 11/17/2019

Reviewer Signature: _____

Date: _____

Phase Documentation:

Phase Type: Remedial Action

Phase Name: MRP Site 2 Alt 3 Excavation and Offsite Disposal FY2023

Description: MRP Site 2 Alt 3 Excavation and Offsite Disposal FY2023

Excavation

i. Perform ground utility surveys and identify soil stockpile and parking areas.

ii. Conduct a pre-excavation survey to mark excavation boundaries.

iii. Identify and mark buried utilities avoid damage during excavation.

e. Excavation

i. Excavate approximately 100 cubic yards¹.

Transport excavated soil by truck to a permitted disposal facility (likely a Class I hazardous waste landfill).

2. Store excavated soil in containers, dump trucks, or stockpiles over 40 mil PVC liner.

iii. Apply erosion and stormwater controls to prevent offsite migration of contaminants and redirect water in the irrigation canal until completion of the remedial action (Trenching and Piping).

iv. Site restoration (backfilling and grading to restore MRP Site 4 topography)

1. Backfill excavation areas with clean material to match the existing grade and compacted to meet local or state requirements.

f. Confirmation soil sampling

i. One incremental sample from the bottom of each grid and one incremental sample from each sidewall of each grid

Approach: Ex Situ

Start Date: October, 2022

Labor Rate Group: System Labor Rate

Analysis Rate Group: System Analysis Rate

Phase Markup Template: System Defaults

<u>Technology Markups</u>	<u>Markup</u>	<u>% Prime</u>	<u>% Sub.</u>
Bulk Material Storage	True	100	0
Ground Utility Surveys	True	100	0
Pre-Excavation Survey	True	100	0
Identify and Mark Buried Utilities	True	100	0
Excavation	True	100	0
Decontamination Facilities	True	100	0
Trenching/Piping	True	100	0
Professional Labor Management	False	0	0
Residual Waste Management	True	100	0

Total Marked-up Cost: \$87,303.45

Technologies:

Technology: Bulk Material Storage

Element:

Unit of Assembly	Description	Quantity	Material Measure	Labor Unit Cost	Unit Equipment Cost	Sub Bid Unit Cost	Cost Cost	Extended Cost	Override
17030425	Sand, 6" Lifts, On-Site	37.00	CY	2.26	4.26	3.07	0.00	\$354.65	False
33080563	40 Mil Polymeric Liner, PVC	2,000.00	SF	1.07	0.92	0.07	0.00	\$4,135.39	False

Total Element Cost: \$4,490.05

Total 1st Year Tech Cost: \$4,490.05

Technology: Ground Utility Surveys

Element:

Unit of Assembly	Description	Quantity	Material Measure	Labor Unit Cost	Unit Equipment Cost	Sub Bid Unit Cost	Cost Cost	Extended Cost	Override
33010102	Sample collection, vehicles, van or pickup rental	1.00	DAY	0.00	0.00	0.00	106.29	\$106.29	False
33010202	Per Diem (per person)	2.00	DAY	0.00	0.00	0.00	151.00	\$302.00	True
33220106	Staff Engineer	12.00	HR	0.00	326.64	0.00	0.00	\$3,919.65	False
33220112	Field Technician	12.00	HR	0.00	165.58	0.00	0.00	\$1,986.92	False

Total Element Cost: \$6,314.86

Total 1st Year Tech Cost: \$6,314.86

Technology: Pre-Excavation Survey

Element:

Unit of Assembly	Description	Quantity	Material Measure	Labor Unit Cost	Unit Equipment Cost	Sub Bid Unit Cost	Cost Cost	Extended Cost	Override
33010102	Sample collection, vehicles, van or pickup rental	1.00	DAY	0.00	0.00	0.00	106.29	\$106.29	False
33220212	Surveying - 2-man Crew	1.00	DAY	0.00	1,963.89	24.87	0.00	\$1,988.77	False

Total Element Cost: \$2,095.05

Total 1st Year Tech Cost: \$2,095.05

Technology: Identify and Mark Buried Utilities

Element:

Unit of Assembly	Description	Quantity	Material Measure	Labor Unit Cost	Unit Equipment Cost	Sub Bid Unit Cost	Cost Cost	Extended Cost	Override
33010102	Sample collection, vehicles, van or pickup rental	1.00	DAY	0.00	0.00	0.00	106.29	\$106.29	False
33010202	Per Diem (per person)	2.00	DAY	0.00	0.00	0.00	151.00	\$302.00	True
33040230	Geonics EM-61 Metal Locator, Hand Held (Weekly Rental)	1.00	WK	0.00	0.00	0.00	1,114.29	\$1,114.29	False
33220106	Staff Engineer	12.00	HR	0.00	326.64	0.00	0.00	\$3,919.65	False
33220112	Field Technician	12.00	HR	0.00	165.58	0.00	0.00	\$1,986.92	False

Total Element Cost: \$7,429.15

Total 1st Year Tech Cost: \$7,429.15

Technology: Excavation

Element:

Unit of Assembly	Description	Quantity	Material Measure	Labor Unit Cost	Unit Equipment Cost	Sub Bid Unit Cost	Cost Cost	Extended Cost	Override
17020416	12 CY Dump Truck Haul/Hour	4.00	HR	0.00	131.20	87.32	0.00	\$874.07	False
17030276	Excavate and load, bank measure, medium material, 3/4	101.00	BCY	0.00	7.31	2.09	0.00	\$949.65	False

Technology: Excavation

17030423	C.Y. bucket, hydraulic excavator Unclassified Fill, 6" Lifts, Off-Site, Includes Delivery, Spreading, and Compaction	115.00	CY	25.39	2.26	1.71	0.00	\$3,376.18	False
18050416	Seeding, Vegetative Cover, Per Square Yard (SY)	360.00	SY	1.44	1.79	0.00	0.00	\$1,164.61	False
33020401	Disposable Materials per Sample	5.00	EA	17.71	0.00	0.00	0.00	\$88.55	False
33021709	Testing, TAL metals (6010/7000s)	5.00	EA	0.00	0.00	0.00	281.66	\$1,408.28	False
33220102	Project Manager	5.00	HR	0.00	359.20	0.00	0.00	\$1,796.01	False
33220108	Project Scientist	5.00	HR	0.00	270.11	0.00	0.00	\$1,350.56	False
33220110	QA/QC Officer	1.00	HR	0.00	256.13	0.00	0.00	\$256.13	False
33220112	Field Technician	1.00	HR	0.00	165.58	0.00	0.00	\$165.58	False
33220114	Word Processing/Clerical	1.00	HR	0.00	168.12	0.00	0.00	\$168.12	False
33220115	Draftsman/CADD	1.00	HR	0.00	159.94	0.00	0.00	\$159.94	False

Total Element Cost: \$11,757.68

Total 1st Year Tech Cost: \$11,757.68

Technology: Decontamination Facilities

Element:

Unit of Assembly	Description	Quantity	Material Measure	Labor Unit Unit Cost	Unit Equipment Cost	Sub Bid Unit Cost	Cost Cost	Extended Cost	Override
19040602	550 Gallon Steel Sump, Aboveground with Supports & Fittings, Excludes Foundation, Pumps, Piping	1.00	EA	6,940.15	972.75	0.00	0.00	\$7,912.90	False

Technology: Decontamination Facilities

33080503	Polymeric Liner Anchor Trench, 3' x 1.5'	88.80	LF	0.38	4.53	0.61	0.00	\$489.75	False
33080532	Geotextile Fabric, Non-Woven 80 Mil	40.00	SY	1.22	1.90	0.05	0.00	\$126.94	False
33080571	40 Mil Polymeric Liner, High- density Polyethylene	360.00	SF	0.81	0.50	0.04	0.00	\$485.36	False
33170818	Spray washers, cold water, electric, 1800 psi, 5 GPM, 5 HP, rent/month	1.00	MO	0.00	0.00	0.00	952.60	\$952.60	False
33170823	Operation of Pressure Washer, Including Water, Soap, Electricity, Labor	10.00	HR	0.00	153.81	0.00	0.00	\$1,538.13	False
33170825	Railroad siding, wood tie, pressure treated, C.L. lots, 6" x 8" x 8'-6" L	9.00	EA	96.24	65.36	4.35	0.00	\$1,493.48	False
33230512	1" Submersible Pump Rental, Month	1.00	MO	0.00	0.00	0.00	1,517.71	\$1,517.71	False
33260623	(2 1/2", 4") PVC Double-wall Piping, with Fittings	30.00	LF	91.61	76.20	0.00	0.00	\$5,034.45	False

Total Element Cost: \$19,551.34

Total 1st Year Tech Cost: \$19,551.34

Technology: Trenching/Piping

Element:

Unit of Assembly	Description	Quantity	Material Measure	Labor Unit Cost	Unit Equipment Cost	Sub Bid Unit Cost	Cost Cost	Extended Cost	Override
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Technology: Trenching/Piping

17030257	Cat 215, 1.0 CY, Soil, Shallow, Trenching, Excludes Sheeting, Excludes Dewatering	14.00	BCY	0.00	1.75	0.60	0.00	\$32.95	False
17030415	On-Site Backfill for Large Excavations, Includes Compaction	16.10	ECY	0.00	1.89	2.06	0.00	\$63.68	False
17030418	Backfill with Crushed Stone	3.33	CY	53.50	2.89	1.56	0.00	\$192.97	False
17030501	Compaction, subgrade, 18" wide, 8" lifts, walk behind, vibrating plate	3.33	ECY	0.00	5.38	0.27	0.00	\$18.81	False
18050206	Erosion control, silt fence, polypropylene, 3' high, includes 7.5' posts	180.00	LF	1.46	4.86	0.00	0.00	\$1,137.63	False
95010201	Storm drainage, HDPE infiltration chamber, 11" H X 16" W, excludes excavation or backfill	180.00	LF	12.95	4.35	0.00	0.00	\$3,114.91	False

Total Element Cost: \$4,560.95

Total 1st Year Tech Cost: \$4,560.95

Technology: Professional Labor Management

Element:

Unit of Assembly	Description	Quantity	Material Measure	Labor Unit Cost	Unit Equipment Cost	Sub Bid Unit Cost	Cost Cost	Extended Cost	Override
33220149	Lump Sum Percentage Labor Cost	1.00	LS	0.00	14,566.00	0.00	0.00	\$14,566.00	True

Total Element Cost: \$14,566.00

Total 1st Year Tech Cost: \$14,566.00

Technology: Residual Waste Management

Element:

Unit of Assembly	Description	Quantity	Material Measure	Labor Unit Cost	Unit Equipment Cost	Sub Bid Unit Cost	Cost Cost	Extended Cost	Override
33190101	Liquid Loading Into 5,000 Gallon Bulk Tank Truck	1.00	EA	0.00	1,102.30	578.83	0.00	\$1,681.13	False
33190102	Bulk Solid Waste Loading Into Disposal Vehicle or Bulk Disposal Container	115.00	BCY	1.85	2.61	0.80	0.00	\$604.90	False
33190108	Tanker Pumping Equipment to Load Liquid	1.00	HR	0.00	0.00	0.00	41.38	\$41.38	False
33190205	Transport Bulk Solid Hazardous Waste, Maximum 20 CY (per Mile)	245.00	MI	0.00	0.00	0.00	3.30	\$808.51	False
33190207	Transport Bulk Liquid/Sludge Hazardous Waste, Maximum 5,000 Gallon (per Mile)	35.00	MI	0.00	0.00	0.00	3.98	\$139.43	False
33190317	Waste Stream Evaluation Fee, Not Including 50% Rebate on 1st Shipment	2.00	EA	0.00	0.00	0.00	74.33	\$148.65	False
33190807	32 Ft. Dump Truck, 6 Mil Liner, disposable	7.00	EA	46.03	0.00	0.00	0.00	\$322.19	False
33197263	Commercial RCRA landfills, bulk waste, solid, based on 2,000 lb/CY	115.00	TON	0.00	0.00	0.00	104.80	\$12,051.90	False
33197274	Commercial RCRA landfills, regional outline, liquid, non-	600.00	GAL	0.00	0.00	0.00	1.23	\$740.28	False

Technology: Residual Waste Management

hazardous

Total Element Cost:	\$16,538.38	
Total 1st Year Tech Cost:	\$16,538.38	
Total Phase Element Cost		\$87,303.45

Appendix C

Sustainability Assessment

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C.1 Introduction

This appendix presents the approach taken and results obtained from a sustainability analysis performed for Munitions Response Program (MRP) Site 2 at Naval Air Facility El Centro in California. A site description and history of MRP Site 2 is provided within the Engineering Evaluation/Cost Analysis (EE/CA). A detailed summary of the alternatives is provided in the EE/CA.

- Alternative 1 – No Action
- Alternative 2 – Institutional Controls
- Alternative 3 – Excavation and Offsite Disposal

The purpose of this analysis is to provide a quantitative assessment of the potential environmental and social impact of each alternative. The sustainability analysis was performed using SiteWise Version 3.1 (Battelle, 2015) for Alternatives 2 and 3. Although the No Action alternative (Alternative 1) has no actions that would impact sustainability, it is not considered a viable alternative and will not be further discussed in this analysis.

C.2 Method and Assumptions

The SiteWise tool consists of a series of Excel-based spreadsheets used to conduct a baseline assessment of sustainability metrics. The assessment is carried out using a spreadsheet-based building block approach, where every removal alternative can be broken down into components for discrete phases of work (such as construction, operation, long-term monitoring), or different systems for more complex removal actions.

SiteWise uses various emission factors from governmental or non-governmental research sources to determine the environmental impact of each activity. The quantitative metrics calculated by the tool include:

- 1) Greenhouse gases (GHGs) reported as metric tons of carbon dioxide equivalents (CO_{2e}), consisting of carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O)
- 2) Energy usage (expressed as millions of British Thermal Units)
- 3) Water usage (gallons of water)
- 4) Air emissions of criteria pollutants consisting of metric tons of nitrogen (NO_x), sulfur oxides (SO_x), and particulate matter (PM₁₀)
- 5) Accident risk (risk of injury and risk of fatality)¹

For the purpose of this discussion, the term “footprint” will be used to describe the quantified emissions or quantities for each metric. To estimate the sustainability footprint for each alternative, only those elements possessing important sustainability impacts were included in the assessment. A lower footprint indicates lower deleterious impacts to environmental and social metrics, which collectively make up the SiteWise sustainability metrics. Conversely, a higher footprint indicates higher deleterious impacts associated with the SiteWise metrics. The major conclusions of this sustainability analysis are incorporated into the short-term effectiveness criteria evaluation of the EE/CA.

¹ Accident risks are based on industry statistics for labor categories (for example construction labor or operating engineers) and on-road passenger miles.

A detailed description of the components of Alternatives 2 and 3 is presented in the EE/CA. The following is a list of the major activities for each alternative considered in the sustainability evaluation:

- Alternative 2 – Institutional Controls
 - Transportation of personnel
 - Onsite labor hours for estimate of accident risks during all field activities
- Alternative 3 – Excavation and Offsite Disposal
 - Material production and equipment use associated with excavation and backfill
 - Laboratory analysis for confirmation sampling
 - Transportation of personnel and equipment
 - Transportation and disposal of soil to a hazardous landfill
 - Onsite labor hours for estimate of accident risks during all field activities

C.2.1 General Assumptions

The specific assumptions made for the individual remedies are presented in **Tables C-1** and **C-2**. The following general assumptions are used for the SiteWise tool evaluation:

- The complete environmental footprint for production of equipment used, or production of the vehicles used for transportation, is not considered in this analysis
- Daily Transportation of personnel (gasoline-powered light duty truck) – 25 miles
- The hazardous landfill is located 50 miles away from the site, and all waste is assumed to be hazardous
- The distances per trip for materials shipped onsite and waste shipped offsite were included at full weight going one way and empty weight going one way
- The following density conversions were used:
 - Soil: 1.0 tons per cubic yard
 - Sand: 1.4 tons per cubic yard
 - Gravel: 1.25 tons per cubic yard
- The following average distances traveled, and weight of equipment were used:
 - Dozer (12 tons), excavator (10 tons): 50 miles round-trip
 - Soil: 50 miles one-way

C.3 Results and Conclusions

A comparative analysis for Alternatives 2 and 3 is summarized on **Figure C-1**. **Table C-3** presents a comparison of the quantitative environmental footprint metrics evaluated for each of the alternatives.

A relative impact summary is also provided in **Table C-3**. The relative impact is a qualitative assessment of the relative footprint of each alternative. A rating of high or low is assigned to each alternative based on its performance against the other alternatives. The tool assigns a rating of high to the highest footprint in each category and assigns the ratings of other alternatives based on the difference in the data between alternatives. The rating is based on a 30 percent difference; for example, if the footprints of two alternatives are within 30 percent of

each other, they will be assigned the same rating. This allows for some uncertainty inherent in the assumptions used in the model. Alternative 3 had the highest footprint in all categories, with the exception of accident risks.

It should be noted that while this analysis compares the environmental footprints of each of the alternatives, the alternatives may differ with respect to other evaluation criteria. Therefore, a comparison of the results of the alternatives needs to be made in the context of the benefits (e.g., applicable or relevant and appropriate requirement compliance, contaminant reduction, site reuse, cost effectiveness, etc.) of each of the alternatives.

The following is a summary of the individual alternatives:

C.3.1 Alternative 2 – Institutional Controls

- **GHG and Energy Use** – 100 percent of the GHG and energy use footprints are associated with transportation of personnel for annual site inspections.
- **Water Use** – There was no significant water usage associated with this alternative.
- **Criteria Air Pollutants (NO_x, SO_x, PM₁₀)** – Similar to the GHG and energy use footprints, 100 percent of the NO_x, SO_x, and PM₁₀ footprints are from transportation of personnel during the annual site inspections.
- **Accident Risks** – The accident risk footprints (risk of fatality and risk of injury) are associated with transportation of personnel (97 and 70 percent, respectively) and onsite labor hours (listed as Equipment Use and Misc.) (3 and 30 percent, respectively) during the annual site inspections.

Results are provided in **Table C-4** and on **Figure C-2**.

C.3.2 Alternative 3 – Excavation and Disposal

- **GHG and Energy Use** – The majority of the GHG and energy use footprints are associated with Material Production (sand and soil for backfill) (43 and 48 percent, respectively), Residual Handling of excavated material (19 and 20 percent, respectively), and transportation of equipment (21 and 16 percent, respectively). Smaller contributions (less than 10 percent) were associated with equipment use, while transportation of personnel contributed to 11 and 9 percent, respectively, of the GHG and energy use footprints.
- **Water Use** – All of the water usage is attributed to decontamination during construction.
- **Criteria Air Pollutants (NO_x, SO_x, PM₁₀)** – Similar to GHG and energy use, the majority of the NO_x, SO_x, PM₁₀ footprints are attributed to material production (657, 78, and 28 percent, respectively) and residual handling of excavated material (25, 14 and 70 percent, respectively).
- **Accident Risks** – The fatality and injury risk footprints are attributed to onsite labor hours (listed as Equipment Use and Misc.) (48 and 78 percent, respectively), transportation of equipment (11 and 5 percent, respectively), transportation of personnel (37 and 16 percent, respectively) and residual handling (4 and 2 percent, respectively).

Results are provided in **Table C-5** and on **Figure C-3**.

C.4 Uncertainty

The SiteWise tool calculates environmental and risk footprints based on industry averages, published emissions factors, and generalized data sources. The footprint results are not representative of actual emissions or accidents and should be used for comparative purposes only.

C.5 Recommendations

The inventory from the SiteWise tool were used to estimate the environmental footprint of the alternatives. Once the alternative is selected, it is recommended that the footprint of the selected alternative be further evaluated during the design phase of the projects to explore opportunities to optimize the environmental performance of the project and integrate sustainable remediation best practices in the design, construction, and operation of the alternative.

Specific best management practices for each alternative are as follows:

- Reduce potable water use by using non-potable water for decontamination.
- Reduce the impact from material production of backfill by selecting more local and less processed materials.
- Reduce the volume of the excavation through additional delineation sampling.

C.6 Reference

Battelle. 2015. *SiteWise Version 3.1*. NAVFAC Engineering Service Center. September.

Tables

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Table C-1. Alternative 2 - Institutional Controls

Annual Monitoring	PERSONNEL TRANSPORTATION - ROAD	Annual Site Inspections
	Will DIESEL-run vehicles be retrofitted with a particulate reduction technology?	No
	Choose vehicle type from drop down menu*	Light truck
	Choose fuel used from drop down menu	Gasoline
	Input distance traveled per trip (miles)	125
	Input number of trips taken	60
	Input number of travelers	1
	Input estimated vehicular fuel economy (mi/gal) (Input only if known for the vehicle selected, otherwise a default will be used by the tool)	
	OPERATOR LABOR	Occupation 1
	Choose occupation from drop-down menu	Scientific and technical services
	Input total time worked onsite (hours)	360.0

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Table C-2. Excavation and Offsite Disposal

Excavation and Disposal	CONSTRUCTION MATERIALS		Material 1					
	Choose material type from drop down menu		HDPE Liner					
	Input area of material (ft2)		2,360					
	Input depth of material (ft)							
	SILT CURTAIN MATERIALS		Curtain 1					
	Input length or perimeter of silt curtain (ft)		180					
	Input depth of silt curtain (ft)		1					
	BULK MATERIAL QUANTITIES		Sand	Soil	Gravel			
	Choose material from drop down menu		Sand	Soil	Gravel			
	Choose units of material quantity from drop down menu		cubic feet	cubic feet	cubic feet			
	Input material quantity		999	1,674	90			
	PERSONNEL TRANSPORTATION - ROAD		Biological Survey	Utility Locate	Surveying Team	Geonics Team	Oversite	Excavation Crew
	Will DIESEL-run vehicles be retrofitted with a particulate reduction technology?		No	No	No	No	No	No
	Choose vehicle type from drop down menu*		Light truck	Light truck	Light truck	Light truck	Light truck	Light truck
	Choose fuel used from drop down menu		Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
	Input distance traveled per trip (miles)		25	25	25	25	25	25
	Input number of trips taken		10	2	2	2	22	20
	Input number of travelers		2	2	2	2	1	2
	Input estimated vehicular fuel economy (mi/gal) (Input only if known for the vehicle selected, otherwise a default will be used by the tool)							
	EQUIPMENT TRANSPORTATION - DEDICATED LOAD ROAD		Sand	Soil	Gravel	Excavator	Dozer	
	Will DIESEL-run vehicles be retrofitted with a particulate reduction technology?		No	No	No	No	No	
	Choose fuel used from drop down menu		Diesel	Diesel	Diesel	Diesel	Diesel	
	Account for an empty return trip?		No	No	No	No	No	
	Input one-way distance traveled (miles) with a given load. If applicable, impact for an empty return trip will be accounted for (no additional input is needed).		150	200	50	100	100	
	Input weight of equipment transported per truck load (tons)		20.00	20.00	20.00	10.00	12.00	
	EQUIPMENT TRANSPORTATION - WATER		Trip 1					
	Input distance traveled (mile)		100					
	Input weight of load (tons)		3					
	EARTHWORK		Equipment 1	Equipment 2				
	Choose earthwork equipment type from drop down menu		Excavator	Dozer				
	Choose fuel type from drop down menu		Diesel	Diesel				
	Input volume of material to be removed (yd3)		62	92				
	Will DIESEL-run equipment be retrofitted with a particulate reduction technology?		No	No				
Method 1 - NAME PLATE SPECIFICATIONS ARE KNOWN								
Input equipment horsepower (hp)		5						
Input number of equipments operating		1						
Input operating time for each equipment (hrs)		10						
Percent of max speed for motor (Optional input for variable speed motor)		100%						
Equipment load if max motor speed draws full nameplate horsepower		1						
Input equipment load (default already present, user override possible, consider above value)		0.85						
Equipment motor efficiency (default already present, user override possible)		0.85						

Table C-2. Excavation and Offsite Disposal

Excavation and Disposal	OPERATOR LABOR	Biological Survey	Utility Locate	Surveying Team	Geonics Team	Oversite	Oversite	
	Choose occupation from drop-down menu	Scientific and technical services	Scientific and technical services	Scientific and technical services	Scientific and technical services	Scientific and technical services	Scientific and technical services	
	Input total time worked onsite (hours)	120.0	24.0	20.0	24.0	132.0	240.0	
	LABORATORY ANALYSIS	Analysis 1						
	Input dollars spent on laboratory analysis (\$)	1,971.62						
	OTHER KNOWN ONSITE ACTIVITIES	Entire Site						
	Water consumption (gallon)	6.0E+02						
	RESIDUE DISPOSAL/RECYCLING	Soil Residue	Residual Water					
	Will DIESEL-run vehicles be retrofitted with a particulate reduction technology?	No	No					
	Input weight of the waste transported to landfill or recycling per trip (tons)	20.0	3.0					
	Choose fuel used from drop down menu	Diesel	Diesel					
	Input total number of trips	4.0	1.0					
	Input number of miles per trip	50.0	35.0					
	LANDFILL OPERATIONS	Operation 1						
	Choose landfill type for waste disposal	Hazardous						
	Input amount of waste disposed in landfill (tons)	62.0						
	Input landfill methane emissions (metric tons CH4)							

Table C-3. Impact Summary and Relative Impact of Alternatives

	GHG Emissions	Total energy Used	Water Used	NO_x emissions	SO_x Emissions	PM10 Emissions	Accident Risk Fatality	Accident Risk Injury
	metric ton	MMBTU	gallons	metric ton	metric ton	metric ton		
Alternative 2 Results	4	52	0	1.7E-03	5.4E-05	2.5E-04	6.0E-05	6.7E-03
Alternative 3 Results	6	104	619	1.8E-02	1.7E-02	1.8E-02	4.9E-05	9.4E-03

	GHG Emissions	Total energy Used	Water Used	NO_x emissions	SO_x Emissions	PM10 Emissions	Accident Risk Fatality	Accident Risk Injury
	metric ton	MMBTU	gallons	metric ton	metric ton	metric ton		
Alternative 2 Results	Medium	Medium	Low	Low	Low	Low	High	High
Alternative 3 Results	High	High	High	High	High	High	High	High

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Table C-4. Alternative 2 Results																	
Phase	Activities	GHG Emissions		Total Energy Used		Water Used		NO _x Emissions		SO _x Emissions		PM ₁₀ Emissions		Accident Risk Fatality		Accident Risk Injury	
		metric ton	Percent of total	MMBTU	Percent of total	gallons	Percent of total	metric ton	Percent of total	metric ton	Percent of total	metric ton	Percent of total		Percent of total		Percent of total
Annual Monitoring	Material Production	0	0%	0	0%	NA	NA	0.0E+00	0%	0.0E+00	0%	0.0E+00	0%	NA	NA	NA	NA
	Transportation-Personnel	4	100%	52	100%	NA	NA	1.7E-03	100%	5.4E-05	100%	2.5E-04	100%	5.9E-05	97%	4.7E-03	70%
	Transportation-Equipment	0	0%	0	0%	NA	NA	0.0E+00	0%	0.0E+00	0%	0.0E+00	0%	0.0E+00	0%	0.0E+00	0%
	Equipment Use and Misc	0	0%	0	0%	NA	NA	0.0E+00	0%	0.0E+00	0%	0.0E+00	0%	1.6E-06	3%	2.0E-03	30%
	Residual Handling	0	0%	0	0%	NA	NA	0.0E+00	0%	0.0E+00	0%	0.0E+00	0%	0.0E+00	0%	0.0E+00	0%
	Total	4.1	100%	52	100%	0.0E+00	NA	1.7E-03	100%	5.4E-05	100%	2.5E-04	100%	6.0E-05	100%	6.7E-03	100%

Notes:
GHG - Greenhouse Gases
MMBTU - million British Thermal Unit
NA - Not Applicable
NA - not applicable
NOx - Nitrogen Oxides
PM10 - Particulate Matter
SOx - Sulfur Oxides

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Table C-5. Alternative 3 Results

Phase	Activities	GHG Emissions		Total Energy Used		Water Used		NO _x Emissions		SO _x Emissions		PM ₁₀ Emissions		Accident Risk Fatality		Accident Risk Injury	
		metric ton	Percent of total	MMBTU	Percent of total	gallons	Percent of total	metric ton	Percent of total	metric ton	Percent of total	metric ton	Percent of total		Percent of total		Percent of total
Excavation and Disposal	Material Production	2.74	43%	50	48%	NA	NA	1.0E-02	57%	1.3E-02	78%	5.0E-03	28%	NA	NA	NA	NA
	Transportation-Personnel	0.71	11%	9	9%	NA	NA	2.9E-04	2%	9.3E-06	0%	4.5E-05	0%	1.8E-05	37%	1.5E-03	16%
	Transportation-Equipmen	1.32	21%	17	16%	NA	NA	8.3E-04	5%	9.6E-05	1%	4.7E-05	0%	5.5E-06	11%	4.4E-04	5%
	Equipment Use and Misc	0.42	7%	7	6%	619	100%	2.1E-03	12%	1.3E-03	8%	2.0E-04	1%	2.4E-05	48%	7.3E-03	78%
	Residual Handling	1.24	19%	21	20%	NA	NA	4.5E-03	25%	2.3E-03	14%	1.2E-02	70%	2.0E-06	4%	1.6E-04	2%
	Total	6.43	100%	104	100%	6.2E+02	6.2E+02	1.8E-02	100%	1.7E-02	100%	1.8E-02	100%	4.9E-05	100%	9.4E-03	100%

Notes:
GHG - Greenhouse Gases
MMBTU - million British Thermal Unit
NA - Not Applicable
NA - not applicable
NOx - Nitrogen Oxides
PM10 - Particulate Matter
SOx - Sulfur Oxides

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Figures

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FIGURE C-1
Sustainability Analysis Summary

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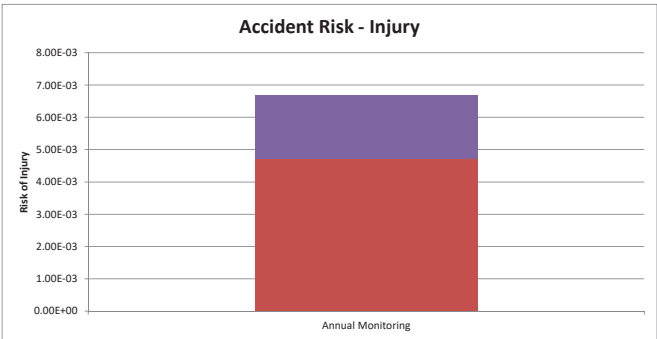
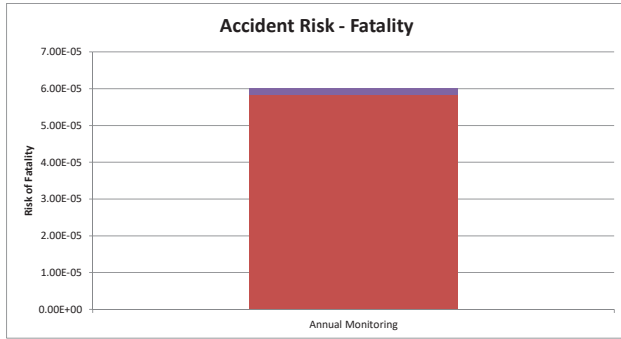
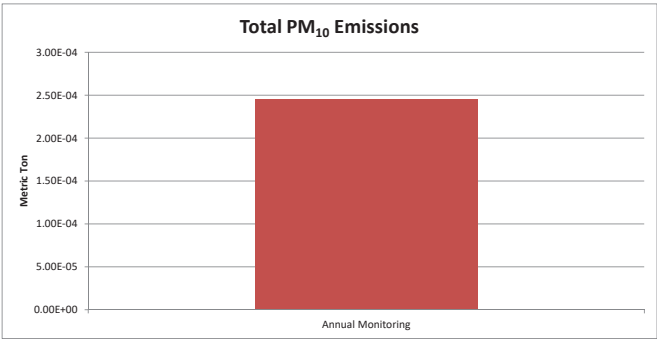
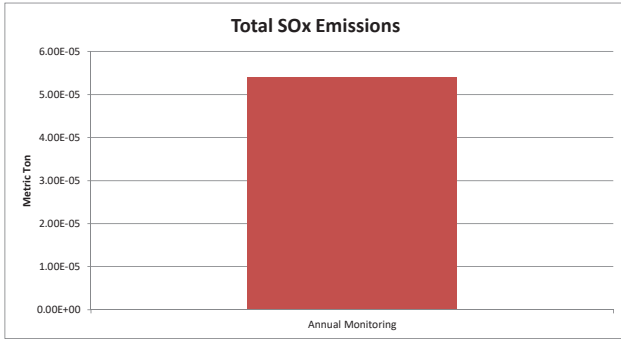
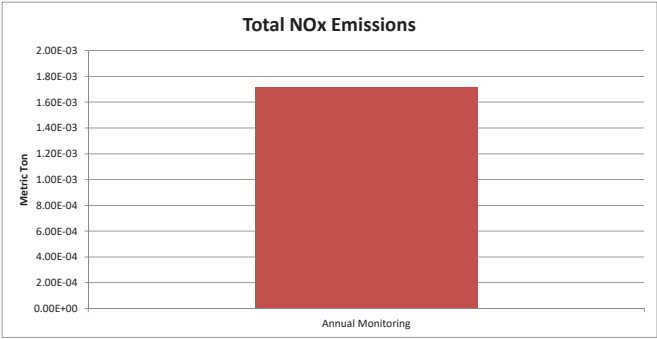
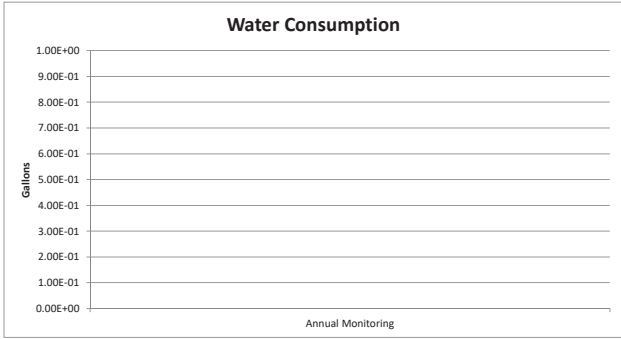
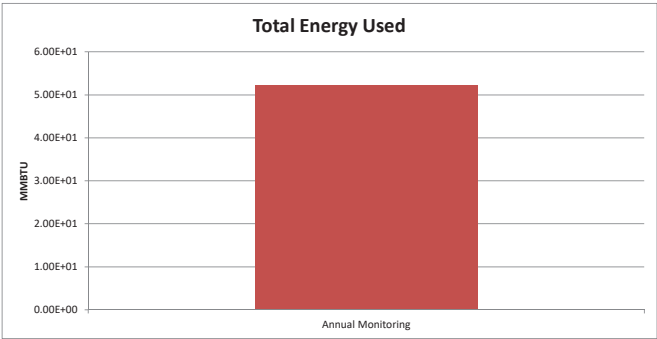
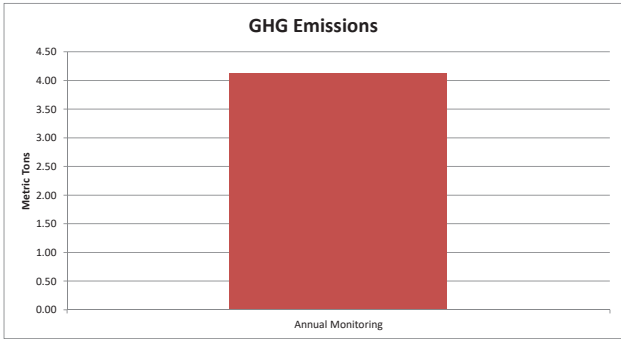


FIGURE C-2
Alternative 2 - Sustainability Analysis Summary

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FIGURE C-3
Alternative 3 - Sustainability Analysis Summary

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Appendix D

Response to Comments

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Jared Blumenfeld
Secretary for
Environmental Protection



Department of Toxic Substances Control

Meredith Williams, Ph.D.
Director
5796 Corporate Avenue
Cypress, California 90630



Gavin Newsom
Governor

SENT VIA ELECTRONIC MAIL

January 20, 2021

Ms. Amy Tong
EV Core, Floor 11
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Engineering Command
750 Pacific Highway
San Diego, California 92132
Amy.tong1@navy.mil

DTSC COMMENTS ON DRAFT ENGINEERING EVALUATION/COST ANALYSIS AND ACTION MEMORANDUM, MUNITIONS RESPONSE PROGRAM SITE 2, NAVAL AIR FACILITY, EL CENTRO, CALIFORNIA (SITE CODE: 400054)

Dear Ms. Tong:

The Department of Toxic Substances Control (DTSC) has reviewed the *Draft Engineering Evaluation/Cost Analysis* (Report) and *Action Memorandum* (AM) for the Munition Response Program (MRP) Site 2 (Site), located at the Naval Air Facility El Centro (NAFEC). The Report and AM were dated November 11, 2020 and prepared by CH2M Hill, Inc. on behalf of the Navy.

NAFEC is an operational naval facility located approximately 7 miles northwest of El Centro and 85 miles east of San Diego. The Site, a former Small Arms Range, is located approximately one mile north of the NAFEC runway, adjacent to the northern installation boundary. It is bound to the east by the drainage swale running north and south across the Site and Patrol Road to the west and south. The approximately 4-acre Site was used for small arms training from 1942 through 1980. The Site is not currently used and is overgrown with desert shrub. The backstop berm was located in the central portion of the Site and was approximately 15 feet high and 75 feet long. It was demolished and the soil from the berm was stockpiled on the central portion of the Site. Based on the Preliminary Assessment (PA), dated 2005, it was concluded that only small arms ammunition was used at the Site and there is no potential for the presence

Ms. Amy Tong
January 20, 2021
Page 2 of 4

of munitions and explosives of concern. Based on the information obtained during the PA search, the stockpiled soil from the backstop berm was determined to be a potential source of munitions constituents (MC) contamination, including lead. It is possible that MC contamination is also present in the stockpiled soil, surface soil adjacent to the stockpile, former berm location, and near the former firing line. Observations during the visual survey identified numerous lead bullets and bullet fragments in the backstop berm soil stockpile. Based on the Remedial Investigation (RI) Report, dated 2019, shallow soil in a limited area located in the western portion of the Site exceeded DTSC residential and industrial screening levels for lead of 80 milligrams per kilogram (mg/kg) and 330 mg/kg, respectively.

The Report compared three remedial alternatives (Alternative 1: No Action; Alternative 2: Institutional Controls; and Alternative 3: Excavation and Off-site Disposal), analyzed and compared their effectiveness, implementability, and cost. The Report recommended Alternative 3-Excavation and Off-site Disposal as the proposed remedy. The Report estimated volume of soil exceeding the proposed residential risk-based cleanup goal of 80 mg/kg is 62 cubic yards. Because the recommended Alternative 3 removes impacted surface and near surface soil, potential for exposure to lead is eliminated. This alternative eliminates the need for long-term maintenance and monitoring and achieves no further action. The Navy will place a public notice in a local newspaper and make the Report available for a 30-day public review and comment.

Based on our review, Ecological Risk Assessment (ERA) comments for the Report are provided in the enclosed memorandum. DTSC Staff Toxicologist, Mr. Eric M. Sciuillo, Ph.D., Human and Ecological Risk Office (HERO), has provided the following comment:

Comment 1: "HERO has reviewed the Draft Engineering Evaluation/Cost Analysis Munitions Response Program Site 2 at Naval Air Facility El Centro as it pertains to human health risk assessment and has the following Comment: HERO recommends that confirmation samples be compared individually to their respective clean up goal to determine if step-out excavations are necessary. The calculation of a sitewide upper confidence limit (UCL) integrating confirmation samples may fail to consider potential hot spots of contamination in the excavation area. At a minimum, multiple lines of evidence including individual comparisons to clean-up goals, excavation area UCLs, and sitewide UCLs should be described to preclude leaving any potential hot spot detections in the excavation area."

The following are DTSC Project Manager's general comments on the Report:

Comment 2: Section 4.2.3.5 Post-Excavation Confirmation Sampling: A total of five incremental soil confirmation samples are proposed, including one from the bottom of the excavation. DTSC recommends two (2) excavation confirmation bottom samples for a total of six (6) samples per excavation.


Ms. Amy Tong
January 20, 2021
Page 3 of 4

Comment 3: Community Notification and Involvement and the Public Notice:
Based on the AM, the Navy is planning to public notice the Report for the 30-day public review and comment period. Please provide more detailed information about the NAFEC community participation plan and how the Navy will make the Report available for public review during COVID-19 quarantine. DTSC public participation staff is available to provide a consultation to the Navy.

Please address the above comments, as well as the attached ERAS comments which may have implications on the proposed remedy, in a Response-to-Comments document prior to finalizing the Report. If you have any questions, or would like to schedule a teleconference, please contact me at irena.edwards@dtsc.ca.gov. You may also contact the Project Supervisor, Ms. Eileen Mananian at eileen.mananian@dtsc.ca.gov.

Sincerely,

Irena
Edwards



Digitally signed
by Irena Edwards
Date: 2021.01.20
13:22:57 -08'00'

Irena Edwards
Project Manager
Site Mitigation and Restoration Program

Peer reviewed by: Ms. Rania A. Zabaneh
Hazardous Substances Engineer

Attachments: ERAS Memorandum, dated January 5, 2021, *Draft Action Memorandum Non-Time Critical Removal Action [NTCRA] Munitions Response Site 2[MRS 2] (Former Small Arms Range) Naval Air Facility [NAF] El Centro, El Centro, California*

cc: Ms. Jessica Bagby
Engineering Geologist
DoD Project Manager
Regional Water Quality Control Board
Colorado River Basin (Region 7)
jessica.bagby@waterboards.ca.gov

Ms. Eileen Mananian, M.S.
Unit Chief
Site Mitigation and Restoration Program
eileen.mananian@dtsc.ca.gov

Ms. Amy Tong
January 20, 2021
Page 4 of 4

cc: Mr. Eric Sciullo, Ph.D.
Staff Toxicologist (HERO)
Site Mitigation and Restoration Program
eric.sciullo@dtsc.ca.gov

Mr. James. Eichelberger, Ph.D.
Staff Toxicologist (ERAS)
Site Mitigation and Restoration Program
james.eichelberger@dtsc.ca.gov



Jared Blumenfeld
Secretary for
Environmental Protection



Department of Toxic Substances Control

Meredith Williams, Ph.D., Director
8800 Cal Center Drive
Sacramento, California 95826-3200



Gavin Newsom
Governor

MEMORANDUM

TO: Irena Edwards
Project Manager
Site Mitigation and Restoration Program
5796 Cypress Avenue
Cypress, California 90630

FROM: J. Michael Eichelberger, Ph.D. *J. Michael Eichelberger*
Staff Toxicologist
Ecological Risk Assessment Section (ERAS)
Human and Ecological Risk Office (HERO)
Department of Toxic Substances Control (DTSC)
8800 Cal Center Drive
Sacramento, California 95826

DATE: 5 January 2021

SUBJECT: DRAFT ACTION MEMORANDUM NON-TIME-CRITICAL REMOVAL
ACTION [NTCRA] MUNITIONS RESPONSE SITE 2 [MRS 2] (FORMER
SMALL ARMS RANGE) NAVAL AIR FACILITY [NAF] EL CENTRO, EL
CENTRO, CALIFORNIA

Project: DTSC400054-47

Activity: 14718

MPC: RAWPN

DOCUMENTS REVIEWED:

ERAS reviewed "Draft Action Memorandum Non-Time-Critical Removal Action [NTCRA] Munitions Response Site 2 [MRS 2] (Former Small Arms Range) Naval [NAF] Air Facility El Centro, El Centro, California". The report was prepared by CH2M Hill, Inc. (San Diego, California) for the Department of the Navy Naval Facilities Engineering Command Southwest, San Diego, California, under Contract Number: N62470-16-D-9000; Task Order FZ08. ERAS received the report for review via an EnviroStor Request dated 17 November 2020.

Irena Edwards
5 January 2021
Page 2 of 3

BACKGROUND INFORMATION:

Munitions Response Site 2 is a 4-acre former small arms range located one mile north of the NAF El Centro runway. The range was built in 1942 with 10 fixed firing positions for .22-, .38-, .45-caliber and 9-mm handguns. Targets were spaced at 10, 20, and 45 yards. The 15-foot high, 75-foot long backstop berm has been removed and stockpiled in the center of the site. The former range appears to have low habitat quality, vegetation that was removed but the report states that desert scrub components have reestablished “locally”. The former firing range is within known range of desert tortoise (*Gopherus agassizii*).

A Preliminary Assessment (PA) was performed in 2005, a Site Investigation (SI) in 2009, and a Remedial Investigation (RI) in 2018. The SI analyzed range soil for bullet-associated metals (antimony, arsenic, copper, lead, and zinc) and explosives residue. The RI report states ecological risks were evaluated with a Tier 1 Screening Level Ecological Risk Assessment (SLERA) and a Step 3a refinement in a Tier 2 Baseline Ecological Risk Assessment (BERA). The BERA found *de minimis* population risk associated with range related Chemicals of Potential Ecological Concern. This ERAS reviewer has not reviewed any of the risk assessment reports.

SCOPE OF THE REVIEW:

ERAS reviewed the NTCRA for content related to ecological risk and the applicability of the remedial option to protect ecological receptors. Minor editorial, stylistic, and/or grammatical issues are not noted.

GENERAL COMMENTS:

1. The report is proposing a NTCRA human-health residential scenario cleanup goal of 80 mg/kg lead. No goal for ecological receptors is proposed, as noted in the text population level effects were not noted. At the population level, 80 mg/kg lead is protective of birds and mammals.
2. The federally and state threatened desert tortoise must be protected at the level of the individual. The NTCRA did not indicate if the BERA found ecological risk relevant at the individual level. Since there is a general lack of toxicity reference values for reptiles, it is difficult to assess risk from site-related constituents to the tortoise. Generally, evaluation of reptile risk is through comparison to the highest bird or mammal risk calculated in the risk assessment. However, this undoubtedly overestimates risk due to the tortoise's lower metabolism rate and feeding behavior. Tortoises follow a foraging route within their home range selectively feeding from favored plants most notably species with high protein content such as native legumes (e.g., *Astragalus sp.*). Both the former range and the surrounding land, which is largely former or current agriculture fields,

Irena Edwards
5 January 2021
Page 3 of 3

should be considered highly disturbed with low probability of having appropriate forage plants for the tortoise. There does not seem to be the necessary resources to support the tortoise. Risk is likely very low.

3. The text indicates that SI samples were likely not sieved. If the bullets and bullet fragments remain, they would seem to present a future source of lead as the bullets degrade over time. Please indicate if the berm soils spread in the central portion of the site have been investigated for bullets.

Conclusion:

Eighty mg/kg soil lead is protective of ecological receptors. It does not seem likely that the desert tortoise is at risk from former range soil lead. ERAS believes the bullets in the former backstop berm soils should be addressed since, if present, they may represent a source of lead release over time.

Reviewed by: Edward A. Fendick, Ph.D.,
Staff Toxicologist
HERO-ERAS Cal Center



Concurrence: Brian Faulkner, Ph.D.
Senior Toxicologist, Unit Chief
HERO-ERAS Cal Center



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Colorado River Basin Regional Water Quality Control Board

March 5, 2021

Amy Tong
NAVFAC Southwest
Project Manager
750 Pacific Hwy 11th Floor
San Diego, CA 92132
amy.tong1@navy.mil
(Via email only)

SUBJECT: DRAFT ENGINEERING EVALUATION/COST ANALYSIS and DRAFT ACTION MEMORANDUM NON-TIME CRITICALREMOVAL ACTION

SITE: MUNITIONS RESPONSE PROGRAM SITE 2 (FORMER SMALL ARMS RANGE), NAVAL AIR FACILITY EL CENTRO, EL CENTRO, CALIFORNIA, GEOTRACKER GLOBAL ID T10000011417

Dear Ms. Tong,

The California Regional Water Quality Control Board, Colorado River Basin Region (Regional Water Board) is the public agency with primary responsibility for the protection of ground and surface water quality in the Colorado River Basin Region. To accomplish this, the Regional Water Board oversees the investigation and cleanup of discharges of waste that may affect the quality of waters of the state as authorized by the Porter-Cologne Water Quality Control Act (California Water Code [CWC], Division 7).

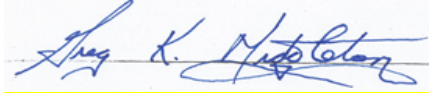
Thank you for the opportunity to review your *Draft Engineering Evaluation / Cost Analysis (EECA)* and the adjoining *Draft Action Memorandum for the Non-Time Critical Removal Action for the subject site aboard Naval Air Facility El Centro, El Centro, California (both dated; November 2020)*. The Regional Water Board understands that the selected method of impact mitigation will consist of a removal action and will look forward to reviewing the removal action workplan when provided with a copy. If you have any questions and/or comments regarding these comments, please contact Jessie Bagby, Engineering Geologist, at (760) 776-8972 or Jessica.Bagby@waterboards.ca.gov.

Amy Tong
NAVFAC Southwest

- 2 -

March 5, 2021

Sincerely,

A handwritten signature in blue ink, appearing to read "Greg K. Middleton", is written over a horizontal line.

Greg Middleton, PG, CHG
Senior Engineering Geologist
Colorado River Basin Region
Regional Water Quality Control Board

cc: Via Email:

Irena Edwards, DTSC, irena.edwards@dtsc.ca.gov
Michel Remington, NAF El Centro Installation Environmental Program,
michel.remington@navy.mil

File: NAF El Centro, MRP Site 2, GeoTracker Global ID T10000011417

Project Coordination and Review – Comments			Job Order/Contract –DO# Navy CLEAN 9000 – CTO FZ08	Prepared By CH2M HILL, Inc.
Comment By Irene Edwards	Code/Organization DTSC	Phone	Email Irena.Edwards@dtsc.ca.gov	Date January 20, 2021

Project Title and Location Draft Engineering Evaluation/Cost Analysis and Action Memorandum, Munitions Response Program Site 2, Naval Air Facility El Centro, El Centro, California		Type of Review
		Pre-Draft
	X	Draft
		Draft Final
		Final
		Other

#	Section No., DWG No, or Paragraph No.	Comments – January 20, 2021	Review Action (Response to Comment and Reasons Where Significant)	Follow-up Comments – April 21, 2021	Review Action (Response to Comment and Reasons Where Significant)
1	General	Department of Toxic Substances Control (DTSC) Staff Toxicologist, Mr. Eric M. Sciullo, Ph.D., Human and Ecological Risk Office (HERO), has provided the following comment: HERO has reviewed the Draft Engineering Evaluation/Cost Analysis (EE/CA) Munitions Response Program (MRP) Site 2 at Naval Air Facility (NAF) El Centro as it pertains to human health risk assessment and has the following Comment: HERO recommends that confirmation samples be compared individually to their respective clean up goal to determine if step-out excavations are necessary. The calculation of a sitewide upper confidence limit (UCL) integrating confirmation samples may fail to consider potential hot spots of contamination in the excavation area. At a minimum, multiple lines of evidence including individual comparisons to clean-up goals, excavation area UCLs, and sitewide UCLs should be described to preclude leaving any potential hot spot detections in the excavation area."	The Navy agrees with the recommendation. Section 4.2.3.5 of the EE/CA and Section V.A.1.5 of the Action Memorandum have been revised accordingly.	Not applicable.	Not applicable.
2	Section 4.2.3.5	Section 4.2.3.5 Post-Excavation Confirmation Sampling: A total of five incremental soil confirmation samples are proposed, including one from the bottom of the excavation. DTSC recommends two (2) excavation confirmation bottom samples for a total of six (6) samples per excavation.	The Navy agrees with the recommendation. Section 4.2.3.5 of the EE/CA and Section V.A.1.5 of the Action Memorandum have been revised accordingly. The costs associated with the additional sample are considered negligent; therefore, the cost estimate has not been revised.	Not applicable.	Not applicable.

#	Section No., DWG No, or Paragraph No.	Comments – January 20, 2021	Review Action (Response to Comment and Reasons Where Significant)	Follow-up Comments – April 21, 2021	Review Action (Response to Comment and Reasons Where Significant)
3	Community Notification and Involvement and the Public Notice	Based on the Action Memorandum, the Navy is planning to public notice the Report for the 30-day public review and comment period. Please provide more detailed information about the NAF El Centro community participation plan and how the Navy will make the Report available for public review during COVID-19 quarantine. DTSC public participation staff is available to provide a consultation to the Navy.	<p>The EE/CA as well as other reference documents, will be made available online or via file transfer protocol (ftp) upon request by the public.</p> <p>Additionally, the public meeting to discuss the preferred alternative for MRP Site 2 will be held via an online platform (i.e., Microsoft Teams, Microsoft Teams Live, Zoom, or something similar).</p> <p>Details regarding access to the public meeting and reference documents will be presented in the notice of availability, public meeting, and public comment period of the EE/CA for MRP Site 2. The notice of availability will be published in a local newspaper (Imperial Valley Press) and other online resources (to be determined).</p> <p>Section V.A.3 of the Action Memorandum has been revised accordingly.</p>	DTSC also requests to mail or email the notice to the DTSC mandatory mailing list and Imperial County government, public, elected officials local native American tribes representatives in addition to the online and local paper publication. Please provide DTSC a draft notice for review prior to the publication/mailing.	The notice will be mailed or emailed to requested recipients. Also, the draft version of the notice will be provided to DTSC for review before publication/mailing.

Project Coordination and Review – Comments			Job Order/Contract –DO# Navy CLEAN 9000 – CTO FZ08	Prepared By CH2M HILL, Inc.
Comment By Michael Eichelberger, Ph.D.	Code/Organization DTSC	Phone	Email James.Eichelberger@dtsc.ca.gov	Date January 20, 2021

Project Title and Location Draft Engineering Evaluation/Cost Analysis and Action Memorandum, Munitions Response Program Site 2, Naval Air Facility El Centro, El Centro, California		Type of Review
		Pre-Draft
	X	Draft
		Draft Final
		Final
		Other

#	Section No., DWG No, or Paragraph No.	Comments – January 20, 2021	Review Action (Response to Comment and Reasons Where Significant)	Follow-up Comments – April 21, 2021	Review Action (Response to Comment and Reasons Where Significant)
1	General	The report is proposing a non-time critical removal action (NTCRA) human-health residential scenario cleanup goal of 80 mg/kg lead. No goal for ecological receptors is proposed, as noted in the text population level effects were not noted. At the population level, 80 mg/kg lead is protective of birds and mammals.	Comment noted.	Not applicable.	Not applicable.
2	General	The federally and state threatened desert tortoise must be protected at the level of the individual. The NTCRA did not indicate if the baseline ecological risk assessment (BERA) found ecological risk relevant at the individual level. Since there is a general lack of toxicity reference values for reptiles, it is difficult to assess risk from site-related constituents to the tortoise. Generally, evaluation of reptile risk is through comparison to the highest bird or mammal risk calculated in the risk assessment. However, this undoubtedly overestimates risk due to the tortoise’s lower metabolism rate and feeding behavior. Tortoises follow a foraging route within their home range selectively feeding from favored plants most notably species with high protein content such as native legumes (e.g., <i>Astragalus sp.</i>). Both the former range and the surrounding land, which is largely former or current agriculture fields, should be considered highly disturbed with low probability of having appropriate forage plants for the tortoise. There does not seem to be the necessary resources to support the tortoise. Risk is likely very low.	Comment noted.	Not applicable.	Not applicable.

#	Section No., DWG No, or Paragraph No.	Comments – January 20, 2021	Review Action (Response to Comment and Reasons Where Significant)	Follow-up Comments – April 21, 2021	Review Action (Response to Comment and Reasons Where Significant)
3	General	The text indicates that Site Inspection (SI) samples were likely not sieved. If the bullets and bullet fragments remain, they would seem to present a future source of lead as the bullets degrade over time. Please indicate if the berm soils spread in the central portion of the site have been investigated for bullets.	<p>The surface of the berm soils spread in the central portion (stockpile) of the site have been surveyed for bullet and bullet fragments. Additionally, the surface soil from the stockpile was investigated for munitions constituents (selected metals) during the SI and Remedial Investigation.</p> <p>Figure 2-4 of the EE/CA presents the distribution of metal debris throughout MRP Site 2 and Section 2.5 of the EE/CA (Nature and Extent of Contamination) states:</p> <p><i>“Based on the results of a detector-aided visual reconnaissance conducted during the RI, small arms ammunition debris is present on the surface and/or unknown metallic items are present in the subsurface across most of MRP Site 2, bound to the east by the drainage swale running north to south across the site.”</i></p> <p>However, as noted in Section 2.7 of the EE/CA:</p> <p><i>“Ammunition debris present at MRP Site 2 is dated up to approximately 77 years at the time of the RI. Results from soil characterization, fate and transport, and risk assessment (Section 2.6) indicate ammunition debris has not resulted in concentrations of ammunition-related metals (antimony, arsenic, copper, lead, and zinc) that are a concern for human health or the environment, and that this is unlikely to change in the future.”</i></p> <p>Furthermore, as noted in Section 4.2.3 of the EE/CA, the preferred remedial alternative (Alternative 3 – Excavation and Offsite Disposal) includes green and sustainable remediation best management practices such as:</p> <p><i>“Recovering metal debris that can be recycled to avoid disposal.”</i></p> <p>Section 4.2.3.4 of the EE/CA and Section V.A.1.4 of the Action Memorandum have been revised to explicitly describe the recovery of bullet and bullet fragments in the surface throughout the site, for clarification.</p>	The Navy could do more than recovering visible bullet and bullet fragments observed in the surface throughout MRP Site 2 and send offsite for recycling. After all during the survey a metal detector was used as stated in Figure 2-4 of the EE. Please add metal detector aided to EE/CA section 4.2.3.4 and AM section V.A.1.4.	<p>The Navy agrees with the recommendation. Section 4.2.3.4 of the EE/CA and Section V.A.1.4 of the Action Memorandum have been revised as follows:</p> <p><i>“A metal detector would be used to assist in identifying bullet and bullet fragments in the surface throughout MRP Site 2 firing line, range floor, and stockpiled soil from the former berm. If bullet and bullet fragments are recovered, they would be shipped offsite for recycling.”</i></p> <p>The costs associated with the additional effort are considered negligent; therefore, the cost estimate has not been revised.</p>

Project Coordination and Review – Comments			Job Order/Contract –DO# Navy CLEAN 9000 – CTO FZ08	Prepared By CH2M HILL, Inc.
Comment By Greg Middleton, PG, CHG	Code/Organization RWQCB	Phone (760) 776-8982	Email	Date March 5, 2021

Project Title and Location Draft Engineering Evaluation/Cost Analysis and Action Memorandum, Munitions Response Program Site 2, Naval Air Facility El Centro, El Centro, California		Type of Review
		Pre-Draft
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		Draft Final
		Final
		Other

#	Section No., DWG No, or Paragraph No.	Comments – March 5, 2021	Review Action (Response to Comment and Reasons Where Significant)
1	General	<p>The California Regional Water Quality Control Board, Colorado River Basin Region (Regional Water Board) is the public agency with primary responsibility for the protection of ground and surface water quality in the Colorado River Basin Region. To accomplish this, the Regional Water Board oversees the investigation and cleanup of discharges of waste that may affect the quality of waters of the state as authorized by the Porter-Cologne Water Quality Control Act (California Water Code [CWC], Division 7).</p> <p>Thank you for the opportunity to review your <i>Draft Engineering Evaluation / Cost Analysis (EECA)</i> and the adjoining <i>Draft Action Memorandum for the Non-Time Critical Removal Action for the subject site aboard Naval Air Facility El Centro, El Centro, California (both dated; November 2020)</i>. The Regional Water Board understands that the selected method of impact mitigation will consist of a removal action and will look forward to reviewing the removal action workplan when provided with a copy. If you have any questions and/or comments regarding these comments, please contact Jessie Bagby, Engineering Geologist, at (760) 776-8972 or Jessica.Bagby@waterboards.ca.gov</p>	Comment noted.

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