

DRAFT

ACTION MEMORANDUM

***Installation Restoration Site 29 Source Area
Non-Time Critical Removal Action for
Groundwater and Soil Gas Remediation
Former Naval Weapons Station
Seal Beach Detachment Concord
Concord, California***

***Contract Number: N62473-12-D-2005
Contract Task Order: 0002***

Document Control Number: SHAW-2005-0002-0006

June 2013



Base Realignment and Closure
Program Management Office West Naval Facilities Engineering Command
1455 Frazee Road, Suite 900
San Diego, California 92108

Table of Contents

List of Figures	ii
List of Appendices	ii
Acronyms and Abbreviations	iii
I. Purpose	1
II. Site Conditions and Background	3
A. Site Description	3
1. Removal Site Evaluation	3
2. Physical Location	4
3. Site Characteristics	5
4. Release or Threatened Release	7
5. National Priorities List Status	7
6. Maps, Pictures, and Other Graphic Representations	7
B. Other Actions to Date	8
1. Previous Actions	8
2. Current Actions	8
C. State and Local Authorities Roles	8
1. State and Local Actions to Date	8
2. Potential for Continued State and Local Response	8
III. Threats to Public Health or Welfare or the Environment, and Statutory and Regulatory Authorities ..	9
A. Threats to Public Health or Welfare	9
B. Threats to the Environment	10
IV. Endangerment Determination	11
V. Proposed Actions and Estimated Costs	12
A. Proposed Action	12
1. Proposed Action Description	12
2. Contribution to Remedial Performance	14
3. Focused Feasibility Study	14
Selected Alternative 3—SVE with ZVI Injection	15
4. Applicable or Relevant and Appropriate Requirements	16
5. Project Schedule	17
B. Estimated Costs	17
VI. Expected Change in the Situation Should Action be Delayed or Not Taken	19
VII. Outstanding Policy Issues	20
VIII. Recommendation	21
IX. References	22

List of Figures

Figure 1	Site Location Map, Site 29
Figure 2	Site Plan, Site 29
Figure 3	Cross Section B-B' and C-C', Site 29
Figure 4	MIP TCE Response 90-80 Feet MSL Near Water Table Saturated Zone, Site 29
Figure 5	Topographic & Hydrogeologic Profiles, Site 29
Figure 6	Treatability Study Layout, Site 29
Figure 7	Site Plan and Groundwater Data, Site 29
Figure 8	TESVE and SVE Well and Soil Gas Monitoring Well Proposed Location Map, Site 29
Figure 9	Proposed CAB Groundwater Injection Areas, Site 29

List of Appendices

Appendix A	Applicable or Relevant and Appropriate Requirements
------------	---

Acronyms and Abbreviations

§	section
µg/L	microgram per liter
Accord and Brady	Accord MACTEC 8A JV and Richard Brady & Associates
AM	Action Memorandum
ARAR	Applicable or Relevant and Appropriate Requirement
Brady	Richard Brady & Associates
bgs	below ground surface
BRAC	Base Realignment and Closure
CAB	combined abiotic and biotic
CE	chlorinated ethene
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
CFR	Code of Federal Regulations
DoD	U.S. Department of Defense
DOT	design optimization test
DP	direct-push
DTSC	California Department of Toxic Substances Control
EPA	U.S. Environmental Protection Agency
FFS	<i>Draft Final Focused Feasibility Study for Groundwater and Soil Gas, IR Site 29, Former Naval Weapons Station Seal Beach, Detachment Concord, Concord, California</i>
IR	Installation Restoration
MIP	membrane interface probe
NAVWPNSTA	Naval Weapons Station Seal Beach Detachment
Navy	U.S. Department of the Navy
NCP	National Oil and Hazardous Substances Pollution Contingency
NTCRA	Non-Time Critical Removal Action
O&M	operation and maintenance
RAO	remedial action objective
RI	remedial investigation
RWQCB	California Regional Water Quality Control Board, San Francisco Bay Region
SCAPS	Site Characterization and Analysis Penetrometer System
SVE	soil vapor extraction
TCE	trichloroethene
TESVE	thermally-enhanced soil vapor extraction
USC	United States Code
VOC	volatile organic compound
ZVI	zero-valent iron

Date: June 27, 2013

To: U.S. Department of the Navy
Naval Facilities Engineering Command Southwest
1455 Frazee Road, Suite 900
San Diego, California 92108-4310

Subject: Action Memorandum
Installation Restoration Site 29 Source Area
Non-Time-Critical Removal Action for
Groundwater and Soil Gas Remediation
Former Naval Weapons Station
Seal Beach Detachment Concord
Concord, California

Site Status: National Priorities List
Category of Removal: Non-Time Critical Removal Action
CERCLIS ID No.: CA7170024528
Site ID No.: OU05

I. Purpose

The purpose of this Action Memorandum (AM) is to document the decision made by the U.S. Department of the Navy (Navy) to undertake a Non-Time Critical Removal Action (NTCRA) for Installation Restoration (IR) Program Site 29 at former Naval Weapons Station Seal Beach Detachment (NAVWPNSTA) Concord. The U.S. Department of Defense (DoD) has the authority to undertake Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) response actions, including removal actions, under 42 United States Code (USC) Section (§) 9604, 10 USC §2705, and Federal Executive Order 12580, as amended. Further, this removal action is consistent, to the maximum extent practicable, with Chapter 6.8 of the California Health and Safety Code.

The Navy is conducting a removal action in accordance with CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), U.S. Environmental Protection Agency (EPA), DoD, and Navy guidance. The NCP requires the lead agent to take any appropriate removal action to abate, prevent, minimize, stabilize, mitigate, or eliminate the release or threat of release where the lead agent determines such action is necessary based on enumerated factors (40 Code of Federal Regulations [CFR] 300.415[b][1]). EPA has categorized removal actions in three ways: emergency, time-critical, and non-time critical based on the type of situation, the urgency and threat of the release or potential release, and the subsequent timeframe in which the action must be initiated. In this case, the Navy has initiated a NTCRA in

response to volatile organic compounds (VOCs) in soil and groundwater, specifically trichloroethene (TCE), which potentially poses a threat to human health and the environment, including groundwater resources.

The proposed NTCRA will consist of soil vapor extraction (SVE) enhanced with heat and in situ treatment of groundwater using biotic and abiotic remediation techniques. The proposed action is expected to remove significant TCE mass from the subsurface soil and groundwater and will substantially reduce risks to human health, the environment and groundwater resources. The following remedial action objectives (RAOs) were developed for the proposed NTCRA at Site 29:

- Prevent residential exposure to VOCs via potential inhalation of soil gas through vapor intrusion at concentrations that result in a cancer risk that exceeds the risk management range of 10^{-4} to 10^{-6} and a hazard index greater than 1.0.
- For burrowing mammals, reduce the inhalation hazard of TCE and 1,1-dichloroethene in shallow soil gas to a hazard quotient of less than 1.0.
- Prevent residential exposure to VOCs via potable use of groundwater containing concentrations that result in a cancer risk that exceeds the risk management range of 10^{-4} to 10^{-6} and a hazard index greater than 1.0.

In addition to the RAOs, this NTCRA is designed to address compliance with Applicable or Relevant and Appropriate Requirements (ARARs) as discussed in Section V.A.4. The ARARs ensure overall protection of human health and the environment, which includes exposure pathways not addressed in the RAOs (i.e., state maximum contaminant levels for groundwater contaminants via ingestion or direct contact).

This removal action constitutes an NTCRA as defined in EPA Office of Solid Waste and Emergency Response Directive 9318.0-05, and is being implemented as provided in Title 40 of the CFR §300.415(b)(2). The proposed NTCRA for this site is deemed appropriate and consistent with the factors set forth within the NCP, 40 CFR §300.415(b)(2), and Chapter 6.8, California Health and Safety Code, because of the following:

- Actual or potential exposure to hazardous substances or pollutants or contaminants by nearby populations, animals, or food chains
- Actual or potential contamination of drinking water supplies or sensitive ecosystems

II. Site Conditions and Background

A. Site Description

The Comprehensive Environmental Response, Compensation and Liability Information System identification number (CERCLIS ID No.) for this site is: CA7170024528. This AM details the NTCRA activities planned for the site, including remediation of TCE in groundwater and soil gas by injection and enhanced SVE, respectively.

1. Removal Site Evaluation

The contamination addressed in this AM and NTCRA is VOCs, specifically TCE in the groundwater and soil gas. This contamination was originally identified in a monitoring well installed in a septic tank leach field in 2005, with an initial TCE concentration of 4,300 micrograms per liter ($\mu\text{g/L}$). This TCE contamination is what caused the initiation of the remedial investigation (RI) of Site 29. Based on the data collected during the RI, it was determined that the VOC contamination is not associated with the septic system or leach field, but instead assumed to be from surface disposal near the edge of the paved area outside Building IA-19 (Richard Brady & Associates [Brady], 2011).

The RI (Brady, 2011) details the previous investigations at Site 29 which include the following:

- Site Investigation for Building Crawl Space Surface Soil (1990)
- Resource Conservation and Recovery Act Facility Assessments (1992 and 1997)
- Site Investigation for Subsurface Soil (1999)
- Remedial Investigation (2011)

Investigations that have occurred since the RI (Brady, 2011) include:

- *In Situ Anaerobic Bioremediation and Solar-Powered Vapor Extraction Treatability Study Installation Restoration Site 29 Presentation to Former Naval Weapons Station Seal Beach Detachment Concord Restoration Advisory Board, Clyde, California* (Shaw Environmental & Infrastructure, Inc., 2013)
- *Draft Final Focused Feasibility Study for Groundwater and Soil Gas, IR Site 29, Former Naval Weapons Station Seal Beach, Detachment Concord, Concord, California* (FFS; Accord MACTEC 8A JV, with subcontract to Richard Brady & Associates [Accord and Brady], 2013)

Current site activities include groundwater monitoring to evaluate the continued performance of the treatability study test wells, and monitoring and trapping for sensitive species. The pilot-scale SVE system remains on site, but is not currently active.

2. *Physical Location*

The Navy is responsible for approximately 5,170 acres, known as the Inland Area of the former NAVWPNSTA Concord. The remaining portions of the former NAVWPNSTA Concord (the Tidal Area and a radiography facility) were previously transferred to the U.S. Army. The Inland Area is located in Contra Costa County, California, approximately 30 miles northeast of San Francisco, California. It is bounded by the Tidal Area to the North, private land and the City of Pittsburg (population approximately 64,000 [U.S. Census Bureau, 2013]) to the east, and the City of Concord (population approximately 124,000 [U.S. Census Bureau, 2013]) to the south and west (Figure 1). Latitude: 37°59'46.83"N, Longitude: 121°59'49.47"W.

Site 29 is located within the south-central portion of the Inland Area at former NAVWPNSTA Concord at the intersection of L Street and Kinne Boulevard. The site includes Buildings IA-25, IA 19, and 263, which are clustered at the end of L Street approximately 1,000 feet southwest of Seal Creek, which is also referred to as Mount Diablo Creek (Figure 2). The buildings are located on the side of a hill and are surrounded by 20-foot high manmade earthen berms (Brady, 2011).

Two amphibians, that are considered special status species, have been observed at former NAVWPNSTA Concord:

- The California red-legged frog (*Rana aurora draytonii*), is currently a federally-listed threatened species and is a state species of special concern.
- The California tiger salamander (*Ambystoma californiense*), is considered threatened at Site 29, but is federally-listed as endangered in Santa Barbara and Sonoma Counties (California Department of Fish and Game, 2006).

Trapping operations are being conducted for the second consecutive year, but to date no California tiger salamanders and California red-legged frogs have been sighted in the immediate vicinity of Site 29.

California tiger salamanders have been known to exist in certain freshwater ponds and vernal pools at former NAVWPNSTA Concord. California tiger salamanders are found at the Hilltop Ponds located approximately 9,000 feet to the northeast of Site 29. California tiger salamanders have been known to spend the majority of their time in burrows created by rodents; cracks and crevices in soil; or in dark, moist places under buildings, old pipes, rip-rap, etc. (Brady, 2011).

3. *Site Characteristics*

Site 29 has been inactive since 2005, when the Base Realignment and Closure (BRAC) commission approved the Inland Area of the base for closure. The acreage of the site is currently approximately 23 acres. There is currently no military activity at Site 29. A treatability study was initiated at the site in 2010, and a solar-powered SVE system was installed at the site. This system ran until January 2013 and is currently inactive. Cattle grazed in the pasture to the east of the access road, but have been fenced out of the area since the installation of the treatability study wells and equipment.

Site 29 includes Buildings IA-25, IA-19, and 263 (Figure 2). Building IA-25 is a 2,300-square-foot building of wood frame construction built on raised piers. Building IA-25 was constructed in 1945 to be used exclusively for pilot-scale development of munitions. The building has been cleared of the components from the munitions and explosive activities. Building 263 is an approximately 15-foot-wide by 32-foot-long building constructed of 8-inch concrete blocks. The buildings are connected by a wooden loading dock. The buildings are cut into the hillside to the south-west and have manmade earthen berms to the northeast. Building IA-19 was built in 1945 and is located approximately 100 feet southeast of Building IA-25 and is an approximately 180-square-foot, slab-on-grade, wooden boiler house. This included an approximately 1,400-gallon underground storage tank and a diesel-fuel-fired boiler to provide heat to Building IA-25 (Accord and Brady, 2013).

In the 1970s, Building IA-25 was renovated for munitions reworking, which involved the following:

- Disassembly
- Inspection
- Limited testing
- Replacement of firing mechanisms
- Reassembly
- Repacking of the ordnance items

Building 263 was constructed in 1973 and used as a breakdown cell for munitions. During this time, Buildings 263 and IA-25 were considered to be a single operating unit used as an ammunition rework and overhaul shop (Accord and Brady, 2013).

Brady conducted an RI in 2011 that characterized the nature and extent of contamination, primarily TCE, at the site. The results of this investigation are detailed in the *Final Remedial*

Investigation for Installation Restoration Site 29, Former Naval Weapons Station Seal Beach Detachment Concord, Concord, California (Brady, 2011).

Site Characterization and Analysis Penetrometer System (SCAPS) membrane interface probe (MIP) investigations were conducted during the RI. The results showed elevated concentrations of TCE in the vadose zone and groundwater. As presented in the RI, the previous conceptual site model from the site investigation for subsurface soil identified the septic system and leach field as the potential source of TCE releases to the groundwater. The SCAPS data along with laboratory analysis of soil, soil gas, and groundwater samples indicated that the source was more likely surface releases near Building IA-19 and the berm/driveway area of Building IA-25. The TCE is thought to have migrated downward through the vadose zone into groundwater (Brady, 2011).

The SCAPS MIP investigations, which collected near-continuous VOC data from ground surface to a maximum depth of 115 feet below ground surface (bgs), found TCE to be the predominant VOC at the site and delineated the anticipated lateral and vertical extents of the TCE plume. The highest MIP TCE response was detected near the water table at SCAPS push location S29CP06, which is located on the driveway between Buildings IA-19 and IA-25, the presumed source area. The cross sections from the RI are included as Figure 3. The water table at location S29CP06 is approximately 50 feet bgs. The highest vadose zone MIP TCE responses occurred at 16 and 40 feet bgs (Brady, 2011). The MIP TCE response from near the water table presented in the RI is included as Figure 4.

In addition to the MIP investigations, groundwater monitoring wells have shown that TCE is the primary chemical of concern in site groundwater. A maximum TCE concentration of 8,200 µg/L was measured at well S29MW01 in May 2007. Based on the 2007 data, the groundwater plume has migrated approximately 725 feet downgradient from the suspected source area. The depth to groundwater ranges from approximately 33 to 52 feet bgs within the known plume area. The water table gradient slopes down toward the north and east toward Seal Creek. The thickness of the TCE plume also increases (downward) as it flows downgradient (Brady, 2011). The topographic and hydrogeologic profiles from the RI are included as Figure 5.

Beginning in 2011, a treatability study with pilot-scale treatability tests was implemented near the suspected source area to assess the potential success of in situ bioremediation of site groundwater and SVE for soil vapor. This treatability study test has proven successful (Shaw Environmental & Infrastructure, Inc., 2013), and the treatments proposed in the AM are based on these investigations. The location of the treatability study test is shown on Figure 6.

The current proposed reuse for the site is medium-low density housing and parks and recreation land (Brady, 2011).

4. *Release or Threatened Release*

Various environmental investigations have indicated the presence of elevated concentrations of VOCs, specifically TCE, in soil gas and groundwater at Site 29. It is suspected that the TCE release is a result a surface discharge off the edge of the access road to the site buildings. Initial TCE concentrations in groundwater were observed to be 4,300 µg/L in samples obtained from a monitoring well in the septic leach field, but higher concentrations of 8,200 µg/L were later observed in S29MW01. Releases of TCE to the environment are assumed to have occurred when the site buildings were active, but are no longer occurring.

5. *National Priorities List Status*

On December 16, 1994, the NAVWPNSTA Concord was included on the National Priorities List as a Superfund site pursuant to CERCLA, as amended by the Superfund Amendments and Reauthorization Act. Groundwater and soil on site were found to be impacted with organic and inorganic contaminants resulting from past site activities. The Navy has been conducting and implementing the IR Program at former NAVWPNSTA Concord since the early 2000s, in accordance with the Federal Facilities Agreement. The Navy's cleanup efforts have been in conjunction with EPA Region 9, California Regional Water Quality Control Board, State of California Environmental Protection Agency's Department of Toxic Substances Control (DTSC) though a Federal Facilities Agreement signed in 2001 (EPA, 2001).

6. *Maps, Pictures, and Other Graphic Representations*

The following figures are included with this AM for clarification of site characteristics:

- Figure 1, "Site Location Map, Site 29"
- Figure 2, "Site Plan, Site 29"
- Figure 3, "Cross Section B-B' and C-C', Site 29"
- Figure 4, "MIP TCE Response 90-80 Feet MSL Near Water Table Saturated Zone, Site 29"
- Figure 5, "Topographic and Hydrogeologic Profiles, Site 29"
- Figure 6, "Treatability Study Layout, Site 29"
- Figure 7, "Site Plan and Groundwater Data, Site 29"
- Figure 8, "TESVE and SVE Well and Soil Gas Monitoring Well Proposed Location Map, Site 29"
- Figure 9, "Proposed CAB Groundwater Injection Areas, Site 29"

B. Other Actions to Date

1. Previous Actions

The only actions performed to date that required cleanup or remediation at the site, were closure of a site septic tank and underground storage tank, but neither of these activities addressed the contaminants associated with this NTCRA. The septic tank was cleaned and decommissioned in place in 1997. The Building IA-19 underground storage tank was removed on July 28, 2004, and closed with no further action by the Contra Costa Health Services Department in 2005 (Brady, 2011).

2. Current Actions

The FFS (Accord and Brady, 2013) has been prepared to develop and evaluate remedial alternatives to mitigate human health and environmental risks associated with exposure to groundwater and soil gas impacted by VOCs at Site 29. The focused feasibility study format was used, because the technologies used in the treatability study recently conducted were proven to effectively treat chlorinated solvents in groundwater and soil gas under the hydrogeologic conditions present at Site 29. The FFS evaluates the remedial action alternatives that were used in directing the activities in the NTCRA (Accord and Brady, 2013).

C. State and Local Authorities Roles

DTSC and the California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB) are state regulatory agency stakeholders at Site 29.

1. State and Local Actions to Date

Federal Executive Order 12580 delegates to the DoD authority to undertake CERCLA response actions. Congress further outlined this authority in its Defense Environmental Restoration Program Amendments, which can be found in 10 USC § 2701, et. seq. Both CERCLA § 120(f) and 10 USC § 2705 require Navy facilities to ensure that state and local officials be given the timely opportunity to review and comment on Navy response actions. Accordingly, the DTSC and the RWQCB have provided technical advice and regulatory oversight during phases of the RI and focused feasibility study processes. The DTSC and the RWQCB are members of the BRAC Cleanup Team along with the EPA and the Navy. The DTSC and the RWQCB (as the State of California) are signatories to the Federal Facility Agreement, which reviews and provides input to response actions.

2. Potential for Continued State and Local Response

The DTSC and RWQCB will continue to provide input through review of site documents, regular site management meetings and participation in the BRAC Cleanup Team. Based on the future land use for the site, the City of Concord is now involved in reviewing site documents. This is expected to continue throughout the NTCRA.

III. Threats to Public Health or Welfare or the Environment, and Statutory and Regulatory Authorities

In accordance with the NCP, the following threats must be considered in determining the appropriateness of a removal action (40 CFR § 300.415[b][2]):

- Actual or potential exposure to nearby populations, animals, or food chains from hazardous substances or pollutants or contaminants
- Actual or potential contamination of drinking water supplies or sensitive ecosystems
- Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release
- High levels of hazardous substances or pollutants or contaminants in soil largely at or near the surface that may migrate
- Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released
- Threat of fire or explosion
- Other situations or factors that may pose threats to public health or welfare or the environment

These potential threats to public health and the environment are discussed in the following sections.

A. Threats to Public Health or Welfare

The following threats apply to current conditions at Site 29:

- Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants
- Actual or potential contamination of drinking water supplies or sensitive ecosystems

Pursuant to CERCLA § 104(a)(1)(A) (42 USC § 9604[a][1][A]), response actions may be implemented whenever there is a release or substantial threat of release of a hazardous substance. Historic activities at Site 29 have resulted in elevated concentrations of VOCs, primarily TCE in soil gas and groundwater. The elevated VOC concentrations being treated during this NTCRA were identified during a risk assessment performed for the RI as possible threats to potential future residents and construction workers at the site (Brady, 2011). Risk to future residents and construction workers is predominantly attributable to exposure to TCE in soil gas (through inhalation) and groundwater (ingestion for residents and inhalation for residents and

workers). The nature of these risks requires a significant reduction in the mass of contaminated material to mitigate potential threats to public health. The recommended action described in this AM will reduce these potential threats to public health caused by VOCs.

B. Threats to the Environment

The following threats apply to conditions at Site 29:

- Actual or potential exposure to nearby populations, animals, or food chains from hazardous substances or pollutants or contaminants
- Actual or potential contamination of drinking water supplies or sensitive ecosystems

The potential pathway for threat to the environment by the VOCs addressed in this NTCRA is inhalation hazard of soil gas for burrowing mammals. The recommended action described in this AM will address these potential threats to the environment.

IV. Endangerment Determination

Actual or threatened releases of pollutants and contaminants from this site, if not addressed by implementing the response action selected in this AM, may present an imminent and substantial endangerment to public health, welfare, or the environment.

V. *Proposed Actions and Estimated Costs*

This section summarizes the proposed removal action for the site. It also discusses ARARs, the project schedule, and the estimated cost of this NTCRA.

A. *Proposed Action*

The objective of the NTCRA is to remediate TCE contamination in vadose zone (unsaturated zone) vapors and chlorinated ethenes (CEs) (including TCE, cis-1,2-dichloroethene, and vinyl chloride) in groundwater (the saturated zone) at Site 29.

1. *Proposed Action Description*

The NTCRA will be performed in a phased approach. The first phase (Phase I) will include groundwater and soil vapor treatment, and will be conducted on the paved area close to Buildings IA-19, IA-25, and 263, as well as within the confines of the current biological fence to the north and northeast of the paved area (Figure 3). The second phase (Phase II) will involve groundwater treatment only and will proceed north, northwest, and northeast of the biological fence, to remediate the bulk of the remaining mass (Figure 7).

Soil Gas Treatment

SVE will be used to remove TCE from vadose zone soil to prevent continued migration of TCE downward to the groundwater and to mitigate potential vapor intrusion to potential future users at Site 29. The vapor extracted from the SVE system will be treated with carbon, and after meeting discharge requirements, will be released to the atmosphere. SVE will work in conjunction with the groundwater treatment to achieve mass removal of VOCs from both the vadose zone and the groundwater, respectively, at Site 29. TCE in the unsaturated zone will be treated using thermally-enhanced SVE (TESVE) technology through a network of approximately 76 SVE and heat injection wells covering an area of approximately 37,900 square feet (Figure 8).

The SVE will be enhanced with localized heating through hot air injection wells to assist in the removal of TCE. Thus, TESVE will be used to increase the volatility of TCE and other CEs from the NTCRA area. Due to the electricity needs of the SVE and TESVE, a temporary 480-volt (or equivalent) pole-line will be constructed along the access road up to the site.

SVE wells in the most heavily impacted area will be constructed to allow the use of TESVE. These dual purpose wells (for vapor extraction or for hot air injection) will be located in the area with the highest soil gas concentrations. Proposed well locations are depicted on Figure 8. The exact location of the SVE wells may change based upon data obtained during installation. The heating enhancements are not permanent and during operation, can be relocated, as needed, to optimize treatment.

The data from the TESVE and SVE system will be collected as needed, which is expected to initially be weekly and reduced to monthly. The data will be continually evaluated for treatment as well as potential optimization changes that may enhance the treatment in recalcitrant areas.

Groundwater Treatment

Prior to initiation of the soil gas and groundwater treatment in Phase I, 13 new groundwater monitoring wells will be installed for performance monitoring. Prior to the initiation of groundwater treatment in Phase II, 3 new groundwater monitoring wells will be installed for performance monitoring, and 2 new groundwater monitoring wells will be installed down gradient of the plume for sentinel monitoring. The locations of the existing and proposed new monitoring wells are presented in Figure 7.

In addition, a design optimization test (DOT) will be conducted at the site to evaluate the proposed injection protocol and determine if there are changes that can be implemented to optimize the treatment. The DOT will evaluate the radius of influence of the injections, the substrate formula (pH, viscosity, etc.), and the overall injection functionality for both the shallow and deep injections. The DOT consists of six injections:

- Three locations 15 feet from an existing monitoring well (S29MW01) to approximately 78 feet total depth
- Three locations 10 feet from an existing well (S29MW03): two to approximately 78 feet total depth and one to approximately 95 feet total depth

Prior to initiating the Phase I injections, the data from this DOT will be evaluated and discussed with the regulators.

TCE and other CEs in the groundwater (the most recent concentrations are presented on Figure 7) will be treated through a combined abiotic (inorganic chemical) and biotic (microbial driven) (combined abiotic and biotic [CAB]) approach). The CAB approach includes direct-push (DP) injections of a substrate containing both zero-valent iron (ZVI) and organic compounds (lecithin and sodium lactate) to facilitate degradation. The DP injections in Phase I will occur over a treatment area of approximately 76,000 square feet (1.75 acres), through a network of up to 223 injection points spaced approximately 20 to 30 feet apart in offset rows across the treatment area. The DP injection in Phase II will also occur over a treatment area of approximately 76,000 square feet through a network of up to 222 injection points spaced approximately 20 to 30 feet apart in offset rows across the treatment area.

Following the previously described amendment injections, hydrogen gas will be slowly released to the groundwater, using HiSOC[®] technology, at approximately six (initially) selected groundwater monitoring wells within the treatment area where higher VOC concentrations are

measured during baseline groundwater sampling. HiSOC[®] technology was effectively applied during the initial treatability study test to deliver an easily utilized electron donor for dechlorination. The flow of hydrogen gas will be maintained at a rate such that the hydrogen is diffused into the groundwater.

Figure 9 shows the anticipated full-scale injection locations, as an example, assuming 20-foot spacing between DP injections. The injections in the south and west of the treatment area are shallow only (down to 75 feet bgs). However, in the northeast of the treatment area, up to 71 DP locations in the northern portion of the Phase I area, and up to 162 DP locations in the Phase II area are required to extend deeper, down to a maximum of approximately 95 feet bgs. The difference in the depth of these injections is due to the downward migration of the TCE plume as it moves downgradient.

Performance of the injections will be monitored using groundwater sampling. Sampling will be conducted quarterly, or as needed and will analyze for constituents related to TCE and the breakdown products, as well as parameters that evaluate site conditions that are required for optimal degradation.

Because of the highly heterogeneous nature of the aquifer, it is unlikely that substrate will be distributed evenly through the entire treatment area. Based on monitoring results, areas that do not appear to be adequately progressing to remediation goals may require additional injections during the NTCRA.

2. *Contribution to Remedial Performance*

Vadose zone soil and groundwater with VOC concentrations exceeding the proposed remediation goals will be treated to achieve RAOs. The evaluation in the FFS (Accord and Brady, 2013) indicates that SVE can effectively remove VOCs from the vadose zone and that the ZVI process alone is expected to be successful at reducing VOC concentrations in groundwater, thereby reducing future health risks. With the addition of heat to the SVE system, and the biotic enhancements in the groundwater treatment, the expectation is that the remediation will occur more quickly. ZVI, the additional substrates, and the biotic components proposed for this NTCRA typically persist in the aquifer for several months and will continue to provide treatment.

3. *Focused Feasibility Study*

A focused feasibility study is being used in lieu of an engineering evaluation/cost analysis for the purposes of this NTCRA. Similar to an engineering evaluation/cost analysis, in the FFS (Accord and Brady, 2013), removal action alternatives were developed and evaluated. Those applicable to this NTCRA are evaluated as removal action alternatives in this AM and the

selected alternative is summarized below. The evaluation criteria used to evaluate the removal action alternatives are described as follows:

Effectiveness

Effectiveness is a judgment regarding the potential for the technology and process option to address the area and volume of contaminated media adequately and reliably. It also identifies any effects to human health and the environment caused by implementation of the technology.

Implementability

Implementability is an evaluation of the technical appropriateness, including the ease or difficulty of implementing the alternative and the reliability of the technology, and the administrative implementability of the technology, such as obtaining waivers or permits, requiring coordination with other offices and agencies.

Cost

Cost is an approximation of the dollar value of the project: it is neither a bid cost nor an engineer's estimate and, in most cases, is a relative cost (high, medium, or low) rather than a quantified value.

The evaluation of effectiveness and implementability of the removal action were considered taking into account the future land use (residential).

Selected Alternative 3—SVE with ZVI Injection

The selected alternative (Alternative 3—SVE with ZVI Injection), as described in the FFS (Accord and Brady, 2013) involves installation of SVE wells to extract VOCs from the vadose zone and treat them ex situ before releasing to the atmosphere, as well as injecting ZVI into the saturated zone to rapidly reduce chlorinated VOCs in the groundwater. Implementation of this alternative for this NTCRA, includes the addition of heat to the SVE system and a biotic component to enhance the groundwater treatment, potentially remediating the site more quickly.

Effectiveness

The selected alternative is protective of human health and the environment, compliant with ARARs identified in Appendix A and demonstrates short and long term effectiveness. The focused feasibility study estimates that this alternative will treat the chlorinated VOCs in soil gas and groundwater to achieve the RAOs (Accord and Brady, 2013). Land use controls may be necessary during treatment.

ZVI and the proposed substrates typically persist in the aquifer for several months and will continue to provide treatment thereby reducing the effect of rebound. In addition, it is expected

that the injections will not be heterogeneous, and specific recalcitrant areas may require additional injections (Accord and Brady, 2013).

Treatment is the primary component of Alternative 3. SVE and ZVI combined would provide irreversible chemical destruction of chlorinated VOCs in the area treated. Under Alternative 3, the toxicity of soil gas and groundwater would be reduced, and the mass of VOCs in the treatment area would be reduced by treatment. ZVI injection with fracturing can be used to target specific hydrogeologic units where TCE was detected by MIP. ZVI injection with hydraulic fracturing will be used for this NTCRA as it has an expected higher radius of influence than direct injection and pneumatic fracturing technologies (Accord and Brady, 2013).

The estimated time to reach the proposed remediation goals in groundwater is approximately one year, post injection. The estimated time to reach preliminary remediation goals in soil gas is five years, post full installation of treatment system. Implementation of this alternative would not be expected to have potential adverse effects on the surrounding community or the environment (Accord and Brady, 2013).

Implementability

The equipment and materials necessary for soil gas and groundwater treatment are anticipated to be readily available. A DOT is beneficial prior to ZVI injection to obtain the parameters and data required for a full-scale implementation. Injections must be closely monitored and documented to avoid unintended dispersal of groundwater contaminants, such as monitoring radius of influence and injection volume (Accord and Brady, 2013).

Cost

The present-value cost for Alternative 3 is approximately \$23 million (including contingency and inflation). Major cost components for this alternative are associated with ZVI injection, SVE operation and maintenance (O&M) and monitored natural attenuation.

4. Applicable or Relevant and Appropriate Requirements

The NCP (40 CFR 300.415[j]) provides that removal actions must attain ARARs to the extent practicable. The ARARs for this NTCRA were compiled for the FFS (Accord and Brady, 2013).

Because CERCLA on-site response actions do not require permitting, only substantive requirements are considered as possible ARARs. Administrative requirements such as approval of or consultation with administrative bodies, issuance of permits, documentation, reporting, recordkeeping, and enforcement are not ARARs for CERCLA actions confined to the site.

There are three types of ARARs. The first type includes “chemical specific” requirements. These ARARs set limits on concentrations of specific hazardous substances, contaminants, and

pollutants in the environment. Examples of this type of ARAR are ambient water quality criteria and drinking water standards. The second type of ARAR includes location-specific requirements for activities based on site characteristics, including activities in wetlands, floodplains, and historic sites. The third type of ARAR includes action-specific requirements, which are technology-based restrictions that are triggered by the type of action under consideration. Examples of action-specific ARARs are regulations for waste treatment, storage, and disposal under the Resource Conservation and Recovery Act.

ARARs must be identified on a site-specific basis from information about specific chemicals at the site, specific features of the site location, and actions that are being considered as removal actions. As the lead federal agency, the Navy has primary responsibility for identifying federal ARARs at former NAVWNSTA Concord, and during the focused feasibility study process, the state identified their ARARs. The substantive provisions of the requirements were identified as potential federal and state chemical-, location-, and action-specific ARARs for Site 29. The ARARs for this NTCRA are presented in Appendix A.

5. *Project Schedule*

The fieldwork for this NTCRA is currently scheduled to begin in August 2013 and the injections are expected to be completed by August 2015, and the O&M of the SVE system is expected to be completed by December 2015. Monitoring is expected to continue until August of 2017. The Removal Action Completion Summary Report is scheduled for regulatory review in July 2016.

B. *Estimated Costs*

The Navy has made an estimate of the removal action costs for the alternatives discussed in the FFS (Accord and Brady, 2013). The estimated costs for this NTCRA and are presented as follows. The estimated present worth total cost for the proposed action, if performed as discussed in the FFS, is approximately \$23,000,000. There are some enhancements to the selected remedy that are proposed for this NTCRA, but the estimated value is not expected to be substantially different.

Non-Time Critical Removal Action Estimated Costs ¹	
Description	Estimated Cost
Remedial Design	\$262,655
Land Use Controls	\$2,440,104
SVE System	\$1,219,477
Soil Vapor Monitoring Probes	\$664,365
Groundwater Monitoring Wells	\$160,002
ZVI Injection and Hydraulic Fracturing	\$8,211,873

Non-Time Critical Removal Action Estimated Costs¹	
SVE O&M and Performance Monitoring	\$3,225,333
Monitoring Well Maintenance	\$23,938
Five Year Reviews	\$199,177
Quarterly Groundwater Monitoring (Year 1 to 2)	\$721,262
Semi-annual Groundwater Monitoring (Year 3 to 4)	\$410,755
Annual Groundwater Monitoring (Year 5)	\$124,796
Monitored Natural Attenuation Annual Groundwater Monitoring (Year 6 to 15)	\$1,247,960
SVE System Decommissioning (Year 6)	\$671,492
Site Closeout (Year 15)	\$367,218
Inflation	\$3,079,759
Estimated Total Costs	\$23,030,104

Note:

¹Cost estimate for Alternative 3—SVE with ZVI Injection as presented in the FFS (Accord and Brady, 2013). Actual estimated costs may differ due to proposed enhancements including biotic component to groundwater treatment and inclusion of heating enhancement to SVE approach, but should remain similar.

VI. Expected Change in the Situation Should Action be Delayed or Not Taken

If action should be delayed or not taken, the TCE in groundwater would be allowed to migrate beyond known locations, thereby potentially resulting in a larger area to be remediated. This condition would result in an increase in costs for investigation, and treatment. In addition, a delay in action would not be protective of human health or the environment in light of the future reuse plan.

VII. Outstanding Policy Issues

No outstanding policy issues exist for this removal action.

VIII. Recommendation

This decision document represents the selected removal action for Site 29 at the former NAVWPNSTA Concord, developed in accordance with CERCLA, as amended, and is consistent with the requirements of 40 CFR. This decision is based on the Naval Facilities Engineering Command Southwest Environmental Restoration Program Record File for the site and documents the decision made by the Navy to undertake an NTCRA for Site 29.

This AM provides information relating to the selection of the proposed removal action at Site 29. Based on the results of the comprehensive evaluation of alternatives conducted in the focused feasibility study, two removal action alternatives were identified in this AM, including the following:

- Alternative 1—No action
- Alternative 3—SVE with ZVI Injection

Of the two alternatives, SVE with ZVI Injection with additional enhancements was selected as the proposed action. This alternative provides the highest level of effectiveness because it will treat groundwater and soil gas to achieve the RAOs. While the overall cost for implementing this alternative is the highest, a treatability study previously conducted has proven to successfully remediate the site groundwater with injection technologies. The enhancements proposed, including a biotic component to the groundwater treatment and heating for the SVE treatment will provide efficient and permanent treatment of groundwater, vadose zone soil and soil gas contamination, and the reduction in contaminant mass will significantly reduce the time required to achieve cleanup goals. Furthermore, this alternative is readily implementable and will achieve the RAOs developed for this removal action at Site 29.

Scott D. Anderson
BRAC Environmental Coordinator
By direction of the Director

Date

IX. References

Accord MACTEC 8A JV, with subcontract to Richard Brady & Associates, 2013, *Draft Final Focused Feasibility Study for Groundwater and Soil Gas, IR Site 29, Former Naval Weapons Station Seal Beach, Detachment Concord, Concord, California*, April.

California Department of Fish and Game, 2006, California Natural Diversity Database.

Federal Executive Order 12580, "Superfund implementation," *Federal Register*.

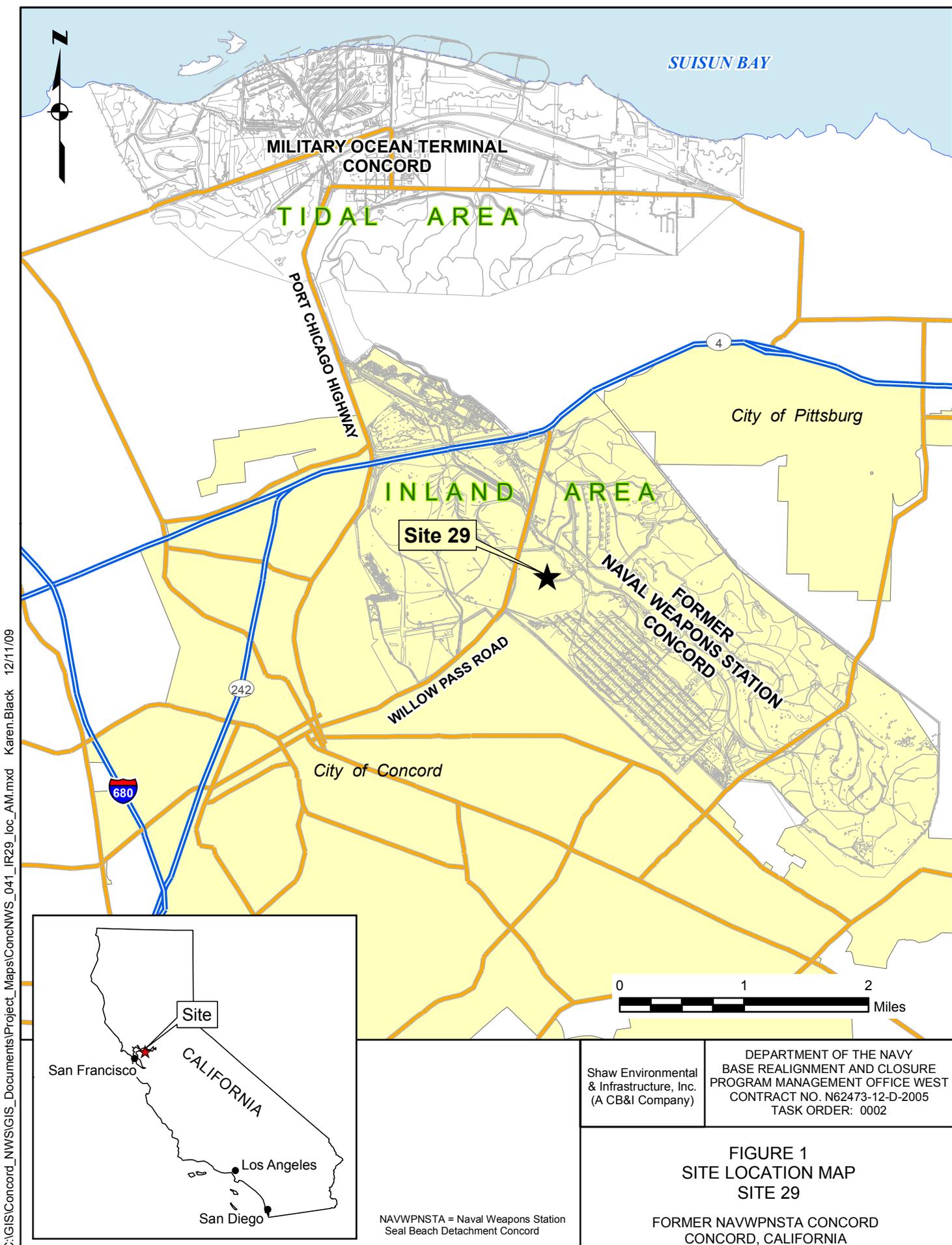
Richard Brady & Associates, 2011, *Final Remedial Investigation for Installation Restoration Site 29, Former Naval Weapons Station Seal Beach Detachment Concord, Concord, California*, March 4.

Shaw Environmental & Infrastructure, Inc., 2013, *In Situ Anaerobic Bioremediation and Solar-Powered Vapor Extraction Treatability Study Installation Restoration Site 29 Presentation to Former Naval Weapons Station Seal Beach Detachment Concord Restoration Advisory Board, Clyde, California*, January 16.

U.S. Census Bureau, 2013, "Contra Costa County, California," *State & County QuickFacts*, March 11, <<http://quickfacts.census.gov/qfd/states/06/06013.html>> (May).

U.S. Environmental Protection Agency (EPA), 2001, *Federal Facilities Agreement Under CERCLA Section 120*, administrative docket number: 01-, June 14.

Figures



C:\GIS\Concord_NWS\GIS_Documents\Project_Maps\ConcNWS_041_IR29_loc_AM.mxd Karen.Black 12/11/09



NAVWPNSTA = Naval Weapons Station
Seal Beach Detachment Concord

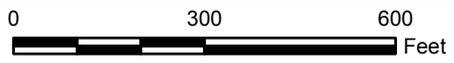
Shaw Environmental
& Infrastructure, Inc.
(A CB&I Company)

DEPARTMENT OF THE NAVY
BASE REALIGNMENT AND CLOSURE
PROGRAM MANAGEMENT OFFICE WEST
CONTRACT NO. N62473-12-D-2005
TASK ORDER: 0002

FIGURE 1
SITE LOCATION MAP
SITE 29
FORMER NAVWPNSTA CONCORD
CONCORD, CALIFORNIA



Image courtesy of USGS © 2013 Microsoft Corporation



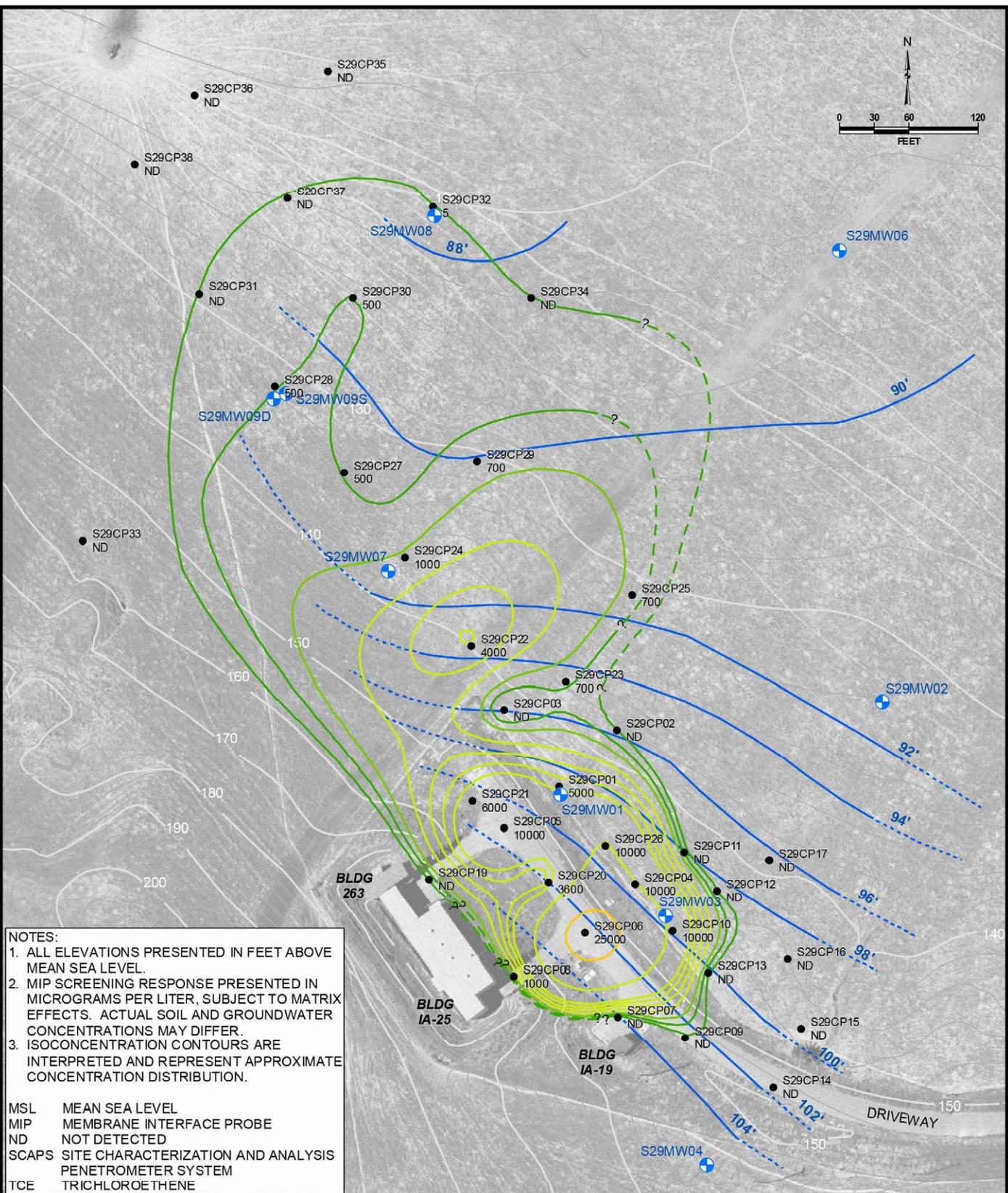
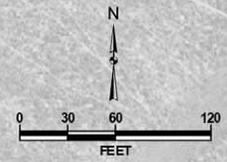
-  Existing Monitoring Well
-  Biological Fence
-  Barbed Wire Fence
-  Shallow TCE Plume
(5 µg/L from RI)

µg/L = micrograms per liter
 NAVWPNSTA = Naval Weapons Station
 Seal Beach Detachment Concord
 RI = Richard Brady and Associates, 2011,
*Final Remedial Investigation for Installation
 Restoration Site 29, Former Naval Weapons
 Station Seal Beach Detachment Concord,
 Concord, California, March 4.*
 TCE = trichloroethene

Shaw Environmental & Infrastructure, Inc. (a CB&I Company)	DEPARTMENT OF THE NAVY BASE REALIGNMENT AND CLOSURE PROGRAM MANAGEMENT OFFICE WEST CONTRACT NO. N62473-12-D-2005 TASK ORDER: 0002
---	---

**FIGURE 2
SITE PLAN
SITE 29**

FORMER NAVWPNSTA CONCORD
CONCORD, CALIFORNIA



NOTES:

1. ALL ELEVATIONS PRESENTED IN FEET ABOVE MEAN SEA LEVEL.
2. MIP SCREENING RESPONSE PRESENTED IN MICROGRAMS PER LITER, SUBJECT TO MATRIX EFFECTS. ACTUAL SOIL AND GROUNDWATER CONCENTRATIONS MAY DIFFER.
3. ISOCONCENTRATION CONTOURS ARE INTERPRETED AND REPRESENT APPROXIMATE CONCENTRATION DISTRIBUTION.

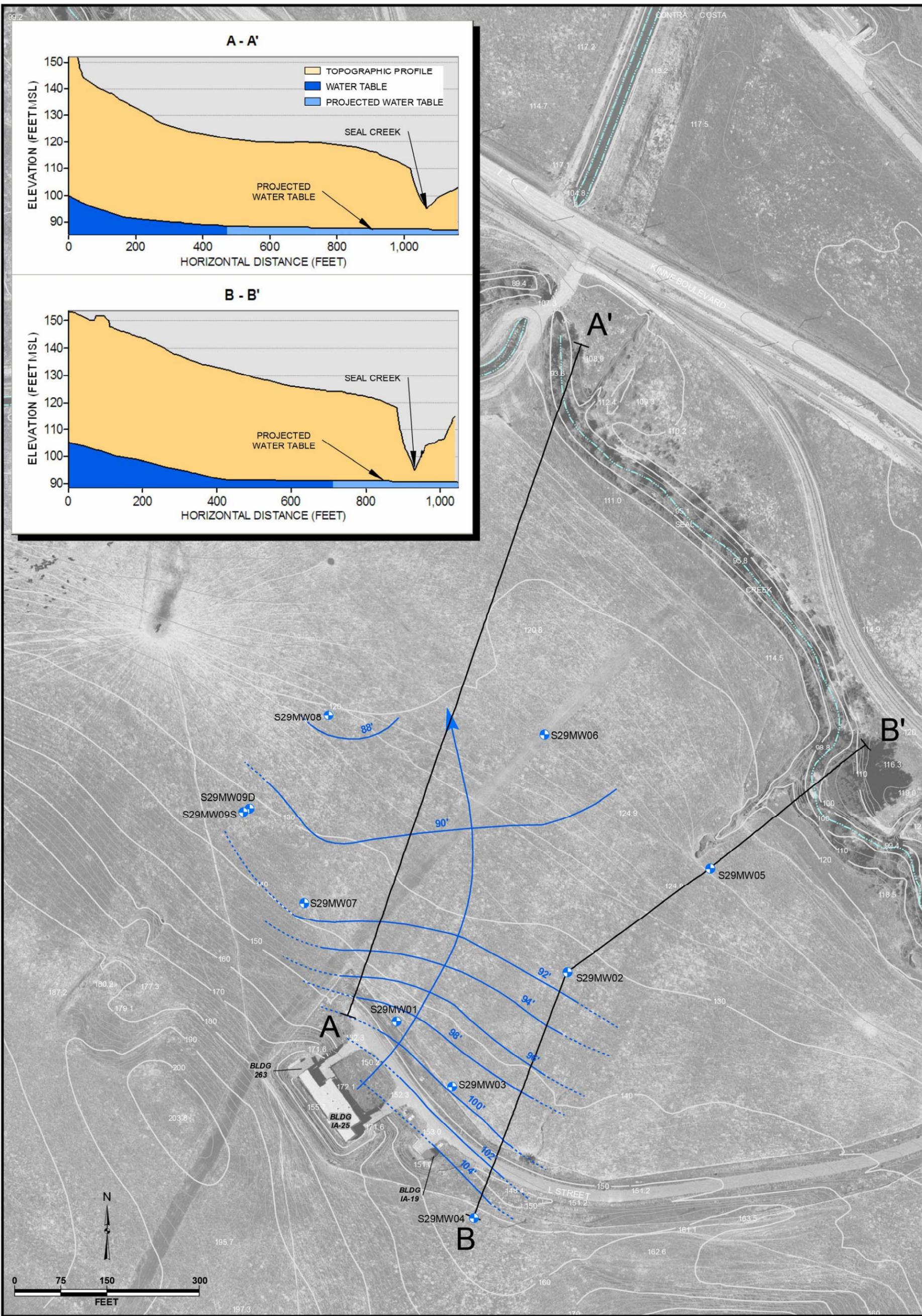
MSL MEAN SEA LEVEL
 MIP MEMBRANE INTERFACE PROBE
 ND NOT DETECTED
 SCAPS SITE CHARACTERIZATION AND ANALYSIS PENETROMETER SYSTEM
 TCE TRICHLOROETHENE

LEGEND	
	MONITORING WELL
	SCAPS PUSH LOCATION
GROUNDWATER ELEVATION CONTOURS SEPTEMBER 2009	
	INTERPRETED GROUNDWATER ELEVATION
	ESTIMATED GROUNDWATER ELEVATION
90-80 FEET MSL TCE RESPONSE	
	0 - 500
	501 - 1,000
	1,001 - 10,000
	10,001 - 100,000
	100,001 - 200,000
	200,001 - 350,000

Shaw Environmental & Infrastructure, Inc.
 (A CB&I Company)

DEPARTMENT OF THE NAVY
 BASE REALIGNMENT AND CLOSURE
 PROGRAM MANAGEMENT OFFICE WEST
 CONTRACT NO. N62473-12-D-2005
 TASK ORDER: 002

FIGURE 4
MIP TCE RESPONSE 90-80 FEET MSL
NEAR WATER TABLE SATURATED ZONE
SITE 29
 FORMER NAVWPNSTA CONCORD
 CONCORD, CALIFORNIA



LEGEND

- MONITORING WELL
- TOPOGRAPHIC PROFILE
- TOPOGRAPHIC CONTOUR
- INDEX
- INTERMEDIATE
- INDEX DEPRESSION
- INTERMEDIATE DEPRESSION
- CANAL / STREAM

GROUNDWATER ELEVATION CONTOURS (SEPTEMBER 2009)

- INTERPRETED ELEVATION
- ESTIMATED ELEVATION
- INTERPRETED FLOW DIRECTION

NOTES

- TOPOGRAPHIC CONTOUR INTERVAL 2 FEET
- ALL ELEVATIONS PRESENTED IN FEET MEAN SEA LEVEL, NAVD 1988

Reference: Richard Brady and Associates, 2011, *Final Remedial Investigation For Installation Restoration Site 29, Former Naval Weapons Station Seal Beach Detachment Concord, Concord, California, March 4 (Figure 5-2).*

Shaw Environmental & Infrastructure, Inc.
(A CB&I Company)

DEPARTMENT OF THE NAVY
BASE REALIGNMENT AND CLOSURE
PROGRAM MANAGEMENT OFFICE WEST
CONTRACT NO. N62473-12-D-2005
TASK ORDER: 002

FIGURE 5
TOPOGRAPHIC & HYDROGEOLOGIC PROFILES
SITE 29

FORMER NAVWPNSTA CONCORD
CONCORD, CALIFORNIA



Legend

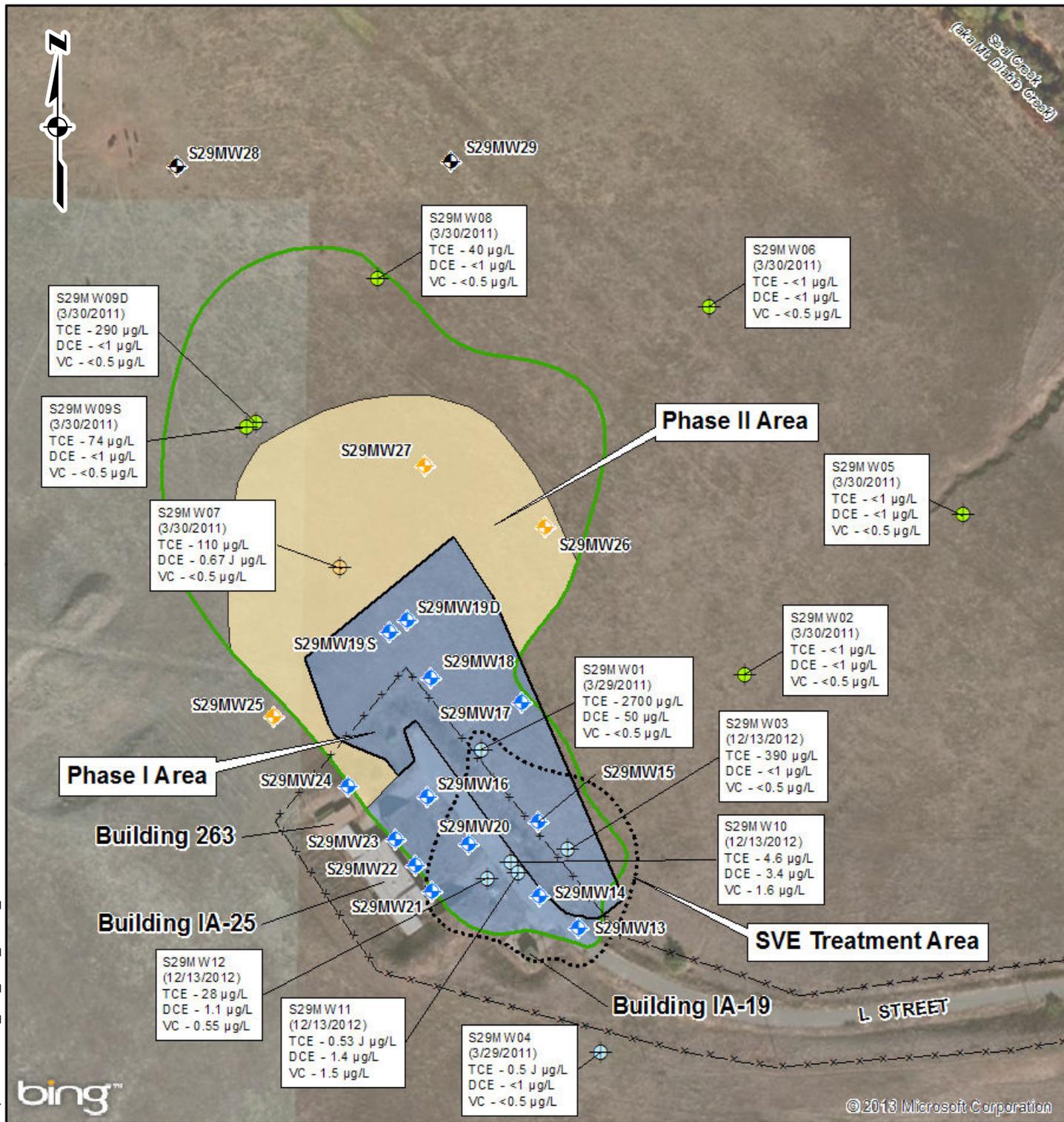
-  Groundwater Monitoring Well
-  Vapor Extraction Well
-  Vapor Monitoring Well
-  Soil Gas Probe
-  Pilot Test Injection Point



Shaw Environmental & Infrastructure, Inc. (A CB&I Company)	DEPARTMENT OF THE NAVY BASE REALIGNMENT AND CLOSURE PROGRAM MANAGEMENT OFFICE WEST CONTRACT NO. N62473-10-D-4009 TASK ORDER: 0007
---	---

FIGURE 6
TREATABILITY STUDY LAYOUT
SITE 29

FORMER NAVWPNSTA CONCORD
CONCORD, CALIFORNIA



- Existing Phase I Performance Monitoring Well
- New Phase I Performance Monitoring Well
- Existing Phase II Performance Monitoring Well
- New Phase II Performance Monitoring Well
- New Sentinel Well
- Existing Plume Monitoring Well
- Biological Fence
- Barbed Wire Fence
- Shallow TCE Plume (5 µg/L from RI)

DCE = cis-1,2-dichloroethene
 J = results estimated
 µg/L = micrograms per liter
 NAVWPNSTA = Naval Weapons Station
 Seal Beach Detachment Concord
 RI = Richard Brady and Associates, 2011,
*Final Remedial Investigation for Installation
 Restoration Site 29, Former Naval Weapons
 Station Seal Beach Detachment Concord,
 Concord, California, March 4.*
 TCE = trichloroethene
 VC = vinyl chloride

Shaw Environmental & Infrastructure, Inc. (a CB&I Company)	DEPARTMENT OF THE NAVY BASE REALIGNMENT AND CLOSURE PROGRAM MANAGEMENT OFFICE WEST CONTRACT NO. N62473-12-D-2005 TASK ORDER: 0002
---	---

FIGURE 7
SITE PLAN AND GROUNDWATER DATA
SITE 29
 FORMER NAVWPNSTA CONCORD
 CONCORD, CALIFORNIA



bing™

© 2013 Microsoft Corporation

- Proposed TESVE Well (Steel Casing)
- Proposed SVE wells (2-inch Diameter PVC)
- Angled Well
- Proposed Soil Gas Monitoring Well
- Existing SVE Well
- Biological Fence

TCE in Soil Gas

- 1,000 $\mu\text{g}/\text{m}^3$
- ▨ 100,000 $\mu\text{g}/\text{m}^3$ (Shallow)
- 100,000 $\mu\text{g}/\text{m}^3$ (Deep)

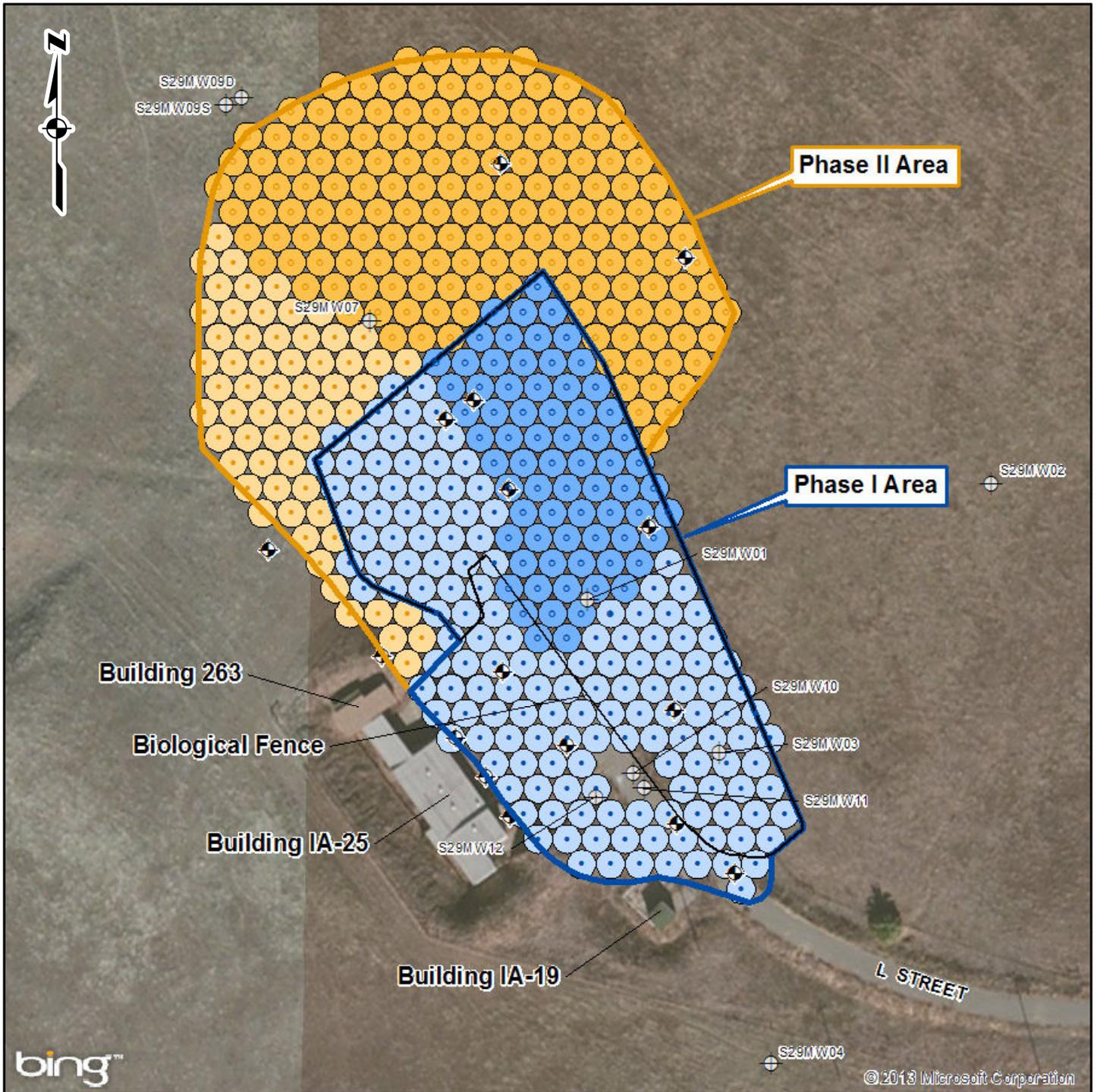
$\mu\text{g}/\text{m}^3$ = micrograms per cubic meter
 NAVWPNSTA = Naval Weapons Station
 Seal Beach Detachment Concord
 PVC = polyvinyl chloride
 SVE = soil vapor extraction
 TCE = trichloroethene
 TESVE = thermally enhanced soil vapor extraction



Shaw Environmental & Infrastructure, Inc. (a CB&I Company)

DEPARTMENT OF THE NAVY
 BASE REALIGNMENT AND CLOSURE
 PROGRAM MANAGEMENT OFFICE WEST
 CONTRACT NO. N62473-12-D-2005
 TASK ORDER: 0002

FIGURE 8
TESVE AND SVE WELL AND SOIL GAS MONITORING WELL PROPOSED LOCATION MAP, SITE 29
 FORMER NAVWPNSTA CONCORD
 CONCORD, CALIFORNIA



Phase I

- CAB Injection Location (Shallow)
- Shallow TDR
- CAB Injection Location (Shallow and Deep)
- Shallow and Deep TDR

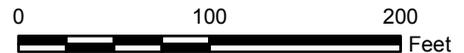
Phase II

- CAB Injection Location (Shallow)
- Shallow TDR
- CAB Injection Location (Shallow and Deep)
- Shallow and Deep TDR

- ⊕ Existing Monitoring Well
- ⊕ Proposed Monitoring Well

CAB = combined abiotic and biotic treatment
 NAVWPNSTA = Naval Weapons Station Seal Beach Detachment Concord
 TDR = target distribution radius

Note: TDR is 10 feet at all locations.



Shaw Environmental & Infrastructure, Inc.
 (a CB&I Company)

DEPARTMENT OF THE NAVY
 BASE REALIGNMENT AND CLOSURE
 PROGRAM MANAGEMENT OFFICE WEST
 CONTRACT NO. N62473-12-D-2005
 TASK ORDER: 0002

FIGURE 9
PROPOSED CAB GROUNDWATER
INJECTION AREAS
SITE 29
 FORMER NAVWPNSTA CONCORD
 CONCORD, CALIFORNIA

Appendix A
Applicable or Relevant and Appropriate Requirements

Tables

Table A2-2. Potential Federal Chemical-Specific ARARs by Medium

Table A2-3. Potential State Chemical-Specific ARARs by Medium

Table A3-1. Potential Federal Location-Specific ARARs

Table A3-2. Potential State Location-Specific ARARs

Table A4-1. Potential Federal Action-Specific ARARs

Table A4-2. Potential State Action-Specific ARARs

Table A2-2. Potential Federal Chemical-Specific^a ARARs by Medium

Requirement	Prerequisite	Citation ^b	ARAR Determination	Comments
GROUNDWATER				
Safe Drinking Water Act (42 USC, Chapter 6A, §300[f]–300[j]-26)^c				
National primary drinking water standards are health-based standards for public water systems (MCLs).	Public water system.	40 CFR §141.11–141.13, excluding §141.11(d)(3), 141.15, 141.16, 141.61(a) and (c), and 141.62(b)	Relevant and appropriate	MCLs were identified for the COCs in groundwater: trichloroethene (TCE), perchloroethene (PCE), benzene, 1,2- dichloroethane (1,2-DCA), and cis-1,2-dichloroethene (cis-1,2-DCE).
MCLGs pertain to known or anticipated adverse health effects (also known as recommended MCLs).	Public water system.	40 CFR §141.50(a)	Relevant and appropriate	The MCLG for 1,1,2-TCA is 3 micrograms per liter, and the MCLG for cis-1,2-DCE is 70 micrograms per liter.
Resource Conservation and Recovery Act (42 USC, Chapter 82, §§6901–6991[i])^c				
Defines RCRA hazardous waste. A solid waste is characterized as toxic, based on the TCLP, if the waste 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	Substantive provisions are potentially applicable for characterizing waste generated at the site.
Groundwater Protection Standards: requirements to ensure that hazardous constituents entering the groundwater from a regulated unit do not exceed the concentration limits for COCs in the uppermost aquifer underlying the waste management area of	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	Cal. Code Regs. tit. 22, §66264.94(a)(1) and (3), (c), (d), and (e)	Relevant and appropriate	Substantive provisions are potentially applicable for the unsaturated zone monitoring and for setting cleanup levels at the site protective of groundwater.

Table A2-2. Potential Federal Chemical-Specific^a ARARs by Medium (continued)

Requirement	Prerequisite	Citation ^b	ARAR Determination	Comments
concern at the POC.	from the waste may pose a threat to human health or the environment.			
The POC is a vertical surface located at the hydraulically downgradient limit of the waste management area that extends through the uppermost aquifer underlying the regulated unit.	Hazardous waste treatment or disposal.	Cal. Code Regs. tit. 22, §66264.95	Relevant and appropriate	Potentially relevant and appropriate if contamination cannot be cleaned up within the plume.
SOIL				
Resource Conservation and Recovery Act (42 USC, Chapter 82, §§6901–6991[i])^c				
Defines RCRA hazardous waste. A solid waste is characterized as toxic, based on the TCLP, if the waste 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	Substantive provisions are potentially applicable for characterizing waste generated at the site.
Groundwater Protection Standards: requirements to ensure that hazardous constituents entering the groundwater from a regulated unit do not exceed the concentration limits for COCs in the uppermost aquifer underlying the waste management area of concern at the POC.	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.	Cal. Code Regs. tit. 22, §66264.94(a)(1) and (3), (c), (d), and (e)	Relevant and appropriate	Substantive provisions are potentially applicable for the unsaturated zone monitoring and for setting cleanup levels at the site protective of groundwater.

Table A2-2. Potential Federal Chemical-Specific^a ARARs by Medium (continued)

Requirement	Prerequisite	Citation ^b	ARAR Determination	Comments
AIR^d				
Clean Air Act (42 USC, Chapter 85, §§7401–7671)^c				
NAAQS: Primary and secondary standards for ambient air quality to protect public health and welfare (including standards for particulate matter and lead).	Contamination of air affecting public health and welfare.	40 CFR §50.4–50.12	—	Not enforceable and therefore not an ARAR.
Provisions of SIP approved by U.S. EPA under Section 110 of Clean Air Act.	Major sources of air pollutants.	42 USC §7401; portions of 40 CFR §52.220 applicable to BAAQMD	Applicable	Potentially applicable through BAAQMD regulations called out below.

Notes:

- a Many potential action-specific ARARs contain chemical-specific limitations and are addressed in the action-specific ARAR tables.
- b Only the substantive provisions of the requirements cited in this table are potential ARARs.
- c Statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader; listing statutes and policies does not indicate that the Department of the Navy accepts the statutes or policies as potential ARARs; specific potential ARARs are addressed in the table below each general heading; only pertinent, substantive requirements of the specific citations are considered potential ARARs.
- d See Section 4.4 for more discussion regarding air requirements related to the SVE system.

Acronyms/Abbreviations:

- §(§) section(s)
- ARAR applicable or relevant and appropriate requirement
- Cal. Code Regs. *California Code of Regulations*
- CFR *Code of Federal Regulations*
- COC chemical of concern
- MCL maximum contaminant level
- MCLG maximum contaminant level goal
- NAAQS National Ambient Air Quality Standards (primary and secondary)
- POC point of compliance

Table A2-2. Potential Federal Chemical-Specific^a ARARs by Medium (continued)

RCRA	Resource Conservation and Recovery Act
SIP	State Implementation Plan
SVE	soil-vapor extraction
TCLP	toxicity characteristic leaching procedure
tit.	title
USC	<i>United States Code</i>
U.S. EPA	United States Environmental Protection Agency

Table A2-3. Potential State Chemical-Specific^a ARARs by Medium

Requirement	Prerequisite	Citation ^b	ARAR Determination	Comments
GROUNDWATER, SURFACE WATER, SOIL, SEDIMENTS, AND AIR				
State and Regional Water Quality Control Boards^c				
A RWQCB, in a water quality control plan or in waste discharge requirements, may specify certain conditions or areas where the discharge of waste, or certain types of waste, will not be permitted.	—	CWC, Division 7 (Porter-Cologne Act), §§13241, 13243, 13263(a), 13269, and 13360	Applicable	The Department of the Navy accepts the substantive provisions of §13243 of the Porter-Cologne Water Quality Control Act enabling legislation, as implemented through the beneficial uses, WQOs, waste discharge requirements, promulgated policies of the Basin Plan for the San Francisco Bay Region, as potential ARARs.
	—	CWC, Division 7, §13304	Not an ARAR	Section 13304 does not constitute an ARAR because it does not itself establish or contain substantive environmental “standards, requirements, criteria or limitations” (CERCLA §121) and is not in itself directive in intent. In addition, §13304 is not more stringent than the substantive requirements of the potential state and federal ARARs identified in this table and Table A2-2.
Describes the water basins in San Francisco Bay 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 water quality control plans and policies.	—	Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) (CWC §13240)	Applicable	Substantive requirements pertaining to beneficial uses, WQOs, and certain statewide water quality control plans are potential state ARARs for protecting water. The requirements of the Basin Plan will be used to set cleanup levels protective of the surface water for this removal action.

Table A2-3. Potential State Chemical-Specific^a ARARs by Medium (continued)

Requirement	Prerequisite	Citation ^b	ARAR Determination	Comments
California Department of Toxic Substances Control^c				
Definition of “non-RCRA hazardous waste.”	Waste.	Cal. Code Regs. tit. 22, §66261.3(a)(2)(C) or 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	Substantive provisions are potentially applicable for determining whether a waste is a non-RCRA hazardous waste.
State MCL list.	Source of drinking water.	Cal. Code Regs. tit. 22, §64431 and 64444	—	Substantive provisions are potentially applicable for benzene, 1,2-DCA, and cis-1,2-DCE because they are more stringent than federal MCLs.
State and Regional Water Quality Control Boards^c				
Describes requirements for RWQCB oversight of investigation and cleanup and abatement activities resulting from discharges of hazardous substances. RWQCB may decide on cleanup and abatement goals and objectives for the protection of water quality and beneficial uses of water within each region. Establishes criteria for “containment zones” where cleanup to established water-quality goals is not economically or technically practicable.	—	Policies and procedures for investigation and cleanup and abatement of discharges under CWC §13304, SWRCB Res. 92-49	Not an ARAR	Not more stringent than federal ARARs at Cal. Code Regs. tit. 22, §66264.94.

Table A2-3. Potential State Chemical-Specific^a ARARs by Medium (continued)

Requirement	Prerequisite	Citation ^b	ARAR Determination	Comments
<p>Establishes the policy that high-quality waters of the state “shall be maintained to the maximum extent possible” consistent with the “maximum benefit to the people of the State.” It provides that whenever the existing quality of water is better than that required by applicable water quality policies, such existing high-quality water will be maintained until it has been demonstrated to the state that any change will be consistent with maximum benefit to the people of the state, will not unreasonably affect present and anticipated beneficial use of such water, and will not result in water quality less than that prescribed in the policies. It also states that any activity that produces or may produce a waste or increased volume or concentration of waste and that discharges or proposes to discharge to existing high-quality waters will be required to meet waste-discharge requirements that will result in the best practicable treatment or control of the discharge.</p>	<p>—</p>	<p>Statement of Policy With Respect to Maintaining High Quality of Waters in California, SWRCB Res. 68-16</p>	<p>Not an ARAR</p>	<p>Not an ARAR for existing contamination or further migration of existing contaminant plumes in groundwater. See Section 2.2.1.2 for further discussion.</p>
<p>Incorporated into all regional board basin plans. Designates all groundwater and surface waters of the state as drinking water except where the TDS is greater than 3,000 ppm, the well yield is less than 200 gpd from a single well, the water is a geothermal resource or in a water conveyance facility, or the water cannot reasonably be treated for domestic use using either best management practices or best economically achievable treatment practices.</p>	<p>—</p>	<p>SWRCB Res. 88-63 (Sources of Drinking Water Policy)</p>	<p>Applicable</p>	<p>The groundwater at Site 29 meets the criteria for a drinking water source.</p>

Table A2-3. Potential State Chemical-Specific^a ARARs by Medium (continued)

Notes:

- a many potential action-specific ARARs contain chemical-specific limitations and are addressed in the action-specific ARAR tables
- b only the substantive provisions of the requirements cited in this table are potential ARARs
- c 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 Department of the Navy accepts the entire statutes or policies as potential ARARs; specific potential ARARs are addressed in the table below each general heading; only pertinent substantive requirements of specific citations are considered potential ARARs

Acronyms/Abbreviations:

§(§)	section(s)
ARAR	applicable or relevant and appropriate requirement
Cal. Code Regs.	<i>California Code of Regulations</i>
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CWC	<i>California Water Code</i>
DCA	dichloroethane
DCE	dichloroethene
gpd	gallons per day
MCL	maximum contaminant level
ppm	parts per million
RCRA	Resource Conservation and Recovery Act
Res.	Resolution
RWQCB	(California) Regional Water Quality Control Board San Diego Region
SWRCB	State Water Resources Control Board
TDS	total dissolved solids
tit.	title
WQO	water quality objective

Table A3-1. Potential Federal Location-Specific ARARs

Location	Requirement	Prerequisite	Citation ^a	ARAR Determination	Comments
National Historic Preservation Act of 1966, as Amended (16 USC §470–470x-6)^b					
Historic project owned or controlled by federal agency	Action to preserve historic properties; planning of action to minimize harm to properties listed on or eligible for listing on the National Register of Historic Places.	Property included in or eligible for the National Register of Historic Places.	16 USC §470–470x-6 36 CFR part 800	Not an ARAR	No potentially eligible property for listing on the National Register is at the site.
Archaeological and Historic Preservation Act (16 USC §469–469c-1)^b					
Within area where action may cause irreparable harm, loss, or destruction of significant artifacts	Construction on previously undisturbed land would require an archaeological survey of the area. Data recovery and preservation would be required if significant archaeological or historical data were found on-site. The responsible official or Secretary of the Interior is authorized to undertake data recovery and preservation.	Regulated alteration of terrain caused as a result of a federal construction project or federally licensed activity or program where action may cause irreparable harm, loss, or destruction of significant artifacts.	16 USC §469–469c-1	Not an ARAR	No potential historical resources are expected.
Historic Sites, Buildings, and Antiquities Act of 1935 (16 USC §§461–467)^b					
Historic sites	Avoid undesirable impacts on landmarks.	Areas designated as historic sites.	16 USC §461–467	Not an ARAR	No potential landmarks are at the site.

Table A3-1. Potential Federal Location-Specific ARARs (continued)

Location	Requirement	Prerequisite	Citation ^a	ARAR Determination	Comments
Archaeological Resources Protection Act of 1979, as Amended (16 USC §470aa–470mm)^b					
Archaeological resources on federal land	Prohibits unauthorized excavation, removal, damage, alteration, or defacement of archaeological resources located on public lands unless such action is conducted pursuant to a permit.	Archaeological resources on federal land.	Public Law No. 96-95 16 USC §470aa–470mm	Not an ARAR	No potential historical resources are expected.
Clean Water Act of 1977, as Amended, §404 (33 USC §1344)^b					
Wetland	Action to prohibit discharge of dredged or fill material into wetland without permit.	Wetland as defined by Executive Order No. 11990 §7.	33 USC §1344	Not an ARAR	No dredge or fill is proposed.
Resource Conservation and Recovery Act (42 USC §§6901–6991[i])^b					
Within 100-year floodplain	Facility must be designed, constructed, operated, and maintained to avoid washout.	RCRA hazardous waste; treatment, storage, or disposal of hazardous waste.	Cal. Code Regs. tit. 22, §66264.18(b)	Not an ARAR	Site 29 is not within a 100-year floodplain.
Wild and Scenic Rivers Act (16 USC §§1271–1287)^b					
Within area affecting national wild, scenic, or recreational river	Avoid taking or assisting in action that will have direct adverse effect on scenic river.	Activities that affect or may affect any of the rivers specified in 16 USC §1276(a).	16 USC §§1271–1287	Not an ARAR	There is no wild or scenic river at the site.
Fish and Wildlife Coordination Act (16 USC §§661–666c)^b					
Area affecting stream or other water body	Action taken should protect fish or wildlife.	Diversion, channeling, or other activity that modifies a stream or other water body and affects fish or wildlife.	16 USC §662	Not an ARAR	No diversion, channeling, or other activity that would modify the stream is planned that would potentially affect wildlife.

Table A3-1. Potential Federal Location-Specific ARARs (continued)

Location	Requirement	Prerequisite	Citation ^a	ARAR Determination	Comments
Rivers and Harbors Act of 1899 (33 USC §§401–413)^b					
Navigable waters	Permits required for structures or work in or affecting navigable waters.	Activities affecting navigable waters.	33 USC §403 33 CFR §322	Not an ARAR	No navigable waters at Site 29.
Endangered Species Act of 1973 (16 USC §§1531–1543)^b					
Habitat upon which endangered species or threatened species depend	Federal agencies may not jeopardize the continued existence of any listed species or cause the destruction or adverse modification of critical habitat. The Endangered Species Committee may grant an exemption for agency action if reasonable mitigation and enhancement measures such as propagation, transplantation, and habitat acquisition and improvement are implemented.	Determination of effect upon endangered or threatened species or their habitat. Critical habitat upon which endangered species or threatened species depend.	16 USC §1531-1543	Applicable	Site 29 may have the threatened tiger salamander and red-legged frog.
Migratory Bird Treaty Act of 1972 (16 USC §§703–712)^b					
Migratory bird area	Protects almost all species of native migratory birds in the U.S. from unregulated “take,” which can include poisoning at hazardous waste sites.	Presence of migratory birds.	16 USC §703	Relevant and appropriate	Substantive provisions are potentially relevant and appropriate for migratory birds at or near the site, such as the golden eagle. The remedial action will be conducted in a manner to minimize effects on migratory birds.

Table A3-1. Potential Federal Location-Specific ARARs (continued)

Location	Requirement	Prerequisite	Citation ^a	ARAR Determination	Comments
Marine Mammal Protection Act (16 USC §§1361–1421h)^b					
Marine mammal area	Protects any marine mammal in the U.S. except as provided by international treaties from unregulated “take.”	Presence of marine mammals.	16 USC §1372(a)(2)	Not an ARAR	No marine mammals suspected at the site.
Magnuson-Stevens Fishery Conservation and Management Act of 1976, as Amended (16 USC §§1801–1882)^b					
Fishery under management	Provides for conservation and management of specified fisheries within specified fishery conservation zones.	Presence of managed fisheries.	16 USC §1801–1882	Not an ARAR	No fisheries located at the site.
National Wildlife Refuge System Administration Act of 1996 (16 USC §668dd–668ee)^b					
Wildlife refuge	No person shall take any animal or plant on any national wildlife refuge, except as authorized under 50 CFR §27.51. The disposing or dumping of wastes is prohibited.	Area designated as part of National Wildlife Refuge System.	16 U.S.C §668dd–668ee Substantive provisions of 50 CFR §27.11–27.97	Not an ARAR	No wildlife refuge at the site.
Wilderness Act (16 USC §§1131–1136)^b					
Wilderness area	Area must be administered in such a manner as will leave it unimpaired as wilderness and preserve its wilderness character.	Federally owned area designated as wilderness area.	16 USC §1131–1136 50 CFR §35.1–35.14	Not an ARAR	No wilderness area at the site.

Table A3-1. Potential Federal Location-Specific ARARs (continued)

Location	Requirement	Prerequisite	Citation ^a	ARAR Determination	Comments
Coastal Zone Management Act (16 U.S.C. §§1451–1464)^b					
Within coastal zone	Conduct activities in a manner consistent with approved state management programs.	Activities affecting the coastal zone including lands thereunder and adjacent shore land.	16 USC §1456(c) 15 CFR §930	Not an ARAR	The site is not located within the coastal zone.
Resource Conservation and Recovery Act (42 U.S.C. §§6901–6991[i])^b					
Within 61 meters (200 feet) of a fault displaced in Holocene time	New treatment, storage, or disposal of hazardous waste prohibited.	RCRA hazardous waste; treatment, storage, or disposal of hazardous waste.	Cal. Code Regs. tit. 22, §66264.18(a)	Not an ARAR	The known faults are ¼-mile or more away from Site 29.
Within salt dome formation, underground mine, or cave	Placement of noncontainerized or bulk liquid hazardous waste prohibited.	RCRA hazardous waste; placement.	Cal. Code Regs. tit. 22, §66264.18(c)	Not an ARAR	No salt domes, underground mines, or caves are known to be at the site.

Notes:

- 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 Department of the Navy accepts the entire statutes or policies as potential ARARs; specific potential ARARs are addressed in the table below each general heading; only substantive requirements of the specific citations are considered potential ARARs.

Acronyms/Abbreviations:

- §(§) section(s)
- ARAR applicable or relevant and appropriate requirement
- Cal Code Regs. *California Code of Regulations*
- CFR *Code of Federal Regulations*
- RCRA Resource Conservation and Recovery Act
- tit. title
- USC *United States Code*

Table A3-2. Potential State Location-Specific ARARs

Location	Requirement	Prerequisite	Citation ^a	ARAR Determination	Comments
Endangered or threatened species	No person shall import, export, take, possess, or sell any endangered or threatened species or part or product thereof.	Threatened or endangered species determination on or before 01 January 1985.	Cal. Fish & Game Code §2080	Relevant and appropriate	Cal. Fish & Game Code §2080 is not applicable because the USA has not waived sovereign immunity in FESA for this State of California requirement. The tiger salamander is a state threatened species. The substantive provisions of Cal. Fish & Game Code §2080 meet the pertinent NCP criteria under 40 CFR §300.400(g)(2)(vii) and are “relevant and appropriate” because the tiger salamander may be present at the site and protection of this vulnerable resource allows it to be “used” in the sense that it continues to provide its unique value to the state of California. The Navy accepts Cal. Fish & Game Code §2080 as a state ARAR subject to the following conditions. The State of California, through DFG-OSPR, concurs that this statute addresses prohibited conduct but does not provide for or prescribe affirmative measures to avoid a “taking.” Notwithstanding the absence of specific affirmative measures in the statute, the Navy will implement reasonable measures to ensure adequate protection of ecological receptors during response action construction following issuance of a CERCLA decision document pursuant to the Navy’s obligations under CERCLA to select removal or remedial actions that are protective of human health and the environment (see CERCLA §121(b)(1)). The Navy will coordinate with the state, through DFG-OSPR, prior to implementation of such reasonable measures. The Navy understands that the state reserves the right to conduct periodic site visits during removal or remedial activities to confirm implementation of avoidance measures.

Table A3-2. Potential State Location-Specific ARARs (continued)

Location	Requirement	Prerequisite	Citation ^a	ARAR Determination	Comments
Fully protected birds	This section states that fully protected birds or parts thereof may not be taken or possessed at any time.	A fully protected species must be potentially affected.	Cal. Fish & Game Code §3511	Relevant and appropriate	Cal. Fish & Game Code §3511 is not applicable because the USA has not waived sovereign immunity in the FESA for this State of California requirement. The golden eagle is a fully protected bird. The substantive provisions of Cal. Fish & Game Code §3511 meet the pertinent NCP criteria under 40 CFR Section 300.400(g)(2)(vii) and are “relevant and appropriate” because the tiger salamander may be present at the site and protection of this vulnerable resource allows it to be “used” in the sense that it continues to provide its unique value to the state of California. The Navy accepts Cal. Fish & Game Code §3511 as a state ARAR subject to the following conditions. The State of California, through DFG-OSPR, concurs that this statute addresses prohibited conduct but does not provide for or prescribe affirmative measures to avoid a “taking.” Notwithstanding the absence of specific affirmative measures in the statute, the Navy will implement reasonable measures to ensure adequate protection of ecological receptors during response action construction following issuance of a CERCLA decision document pursuant to the Navy’s obligations under CERCLA to select removal or remedial actions that are protective of human health and the environment (see CERCLA §121(b)(1)). The Navy will coordinate with the state, through DFG-OSPR, prior to implementation of such reasonable measures. The Navy understands that the state reserves the right to conduct periodic site visits during removal or remedial activities to confirm implementation of avoidance measures.

Table A3-2. Potential State Location-Specific ARARs (continued)

Location	Requirement	Prerequisite	Citation ^a	ARAR Determination	Comments
Fisher marten, river otter, desert kit fox, and red fox	Fisher, marten, river otter, desert kit fox, and red fox may not be taken at any time.	A fisher, marten, river otter, desert kit fox, or red fox must be potentially harmed.	Cal. Code Regs. tit. 14, §460	Not an ARAR	Cal. Code Regs. tit. 14, §460 is not applicable because the USA has not waived sovereign immunity for this State of California requirement. The activities regulated by this section are not sufficiently similar to the circumstance of the release or response action alternatives to be relevant and appropriate and are not well suited to the site pursuant to 40 CFR §300.400(g)(2)(i) and (iv) of the NCP. The purpose of this section is to prevent the taking of the species specified. In contrast, the Navy response action alternatives are intended to respond to releases of hazardous substances in order to protect human health and the environment. Therefore, Cal. Code Regs. tit. 14, §460 is not a “relevant and appropriate” ARAR. However, ecological risk assessments will take into account representative receptors specific for each location. 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.
Area with birds or mammals	This section prohibits the taking of birds and mammals, including taking by poison.		Cal. Fish & Game Code §3005	Not an ARAR	Cal. Fish & Game Code §3005 is not applicable because the USA has not waived sovereign immunity in the FESA 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 Subsections 300.400(g)(2)(i) and (iv) of the NCP. CERCLA response actions are intended to respond to releases of hazardous substances in order 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 those requirements. Moreover, that purpose is achieved through the regulation of intentional conduct directed at the species as opposed to

Table A3-2. Potential State Location-Specific ARARs (continued)

Location	Requirement	Prerequisite	Citation ^a	ARAR Determination	Comments
					<p>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 Subsections 300.400(g)(2)(i) and (iv) of the NCP.</p> <p>Although this requirement is not an ARAR, the Navy will coordinate with other natural resource trustees throughout the CERCLA remedial action process. The Navy’s ecological risk assessment process takes into account representative environmental receptors for the site, and final remediation/cleanup goals will ensure that they are adequately protected from exposure to CERCLA hazardous stances that present unacceptable risk. 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.</p>

Table A3-2. Potential State Location-Specific ARARs (continued)

Location	Requirement	Prerequisite	Citation ^a	ARAR Determination	Comments
Bird nest or eggs	It is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto.	Bird nests or eggs on site.	Cal. Fish & Game Code §3503	Not an ARAR	Cal. Fish & Game Code §3503 is not applicable because the USA has not waived sovereign immunity for this State of California requirement. The activities regulated by this section are not sufficiently similar to the circumstance of the release or response action alternatives to be relevant and appropriate and are not well suited to the site pursuant to 40 CFR §300.400(g)(2)(i) and (iv) of the NCP. The purpose of this section is to prevent the taking of the species specified. In contrast, the Navy response action alternatives are intended to respond to releases of hazardous substances in order to protect human health and the environment. Therefore, Cal. Fish & Game Code §3503 is not a “relevant and appropriate” ARAR. However, ecological risk assessments will take into account representative receptors specific for each location. 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.
Falconiformes or Strigiformes	It is unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (birds-of-prey) or to take, possess, or destroy the nest or eggs of any such bird.	Falconiformes or Strigiformes birds on site.	Cal. Fish & 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.

Table A3-2. Potential State Location-Specific ARARs (continued)

Location	Requirement	Prerequisite	Citation ^a	ARAR Determination	Comments
Mountain lion	It is unlawful to take, injure, possess, transport, import, or sell any mountain lion or any part or product thereof.	A mountain lion must be potentially affected by the response action.	Cal. Fish & Game Code §4800	Not an ARAR	Cal. Fish & Game Code §4800 is not applicable because the USA has not waived sovereign immunity for this State of California requirement. The activities regulated by this section are not sufficiently similar to the circumstance of the release or response action alternatives to be relevant and appropriate and are not well suited to the site pursuant to 40 CFR §300.400(g)(2)(i) and (iv) of the NCP. The purpose of this section is to prevent the taking of the species specified. In contrast, the Navy response action alternatives are intended to respond to releases of hazardous substances in order to protect human health and the environment. Therefore, Cal. Fish & Game Code §4800 is not a “relevant and appropriate” ARAR. However, ecological risk assessments will take into account representative receptors specific for each location. 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.
Waters of the State	Prohibits the passage of enumerated substances or materials into waters of the state deleterious to fish, plant life, or birds.	Discharge not authorized under California Water Code §13263 or a waiver issued pursuant to subdivision (a) of §13269.	Cal. Fish & Game Code §5650 (a), (b), and (c)	Not an ARAR	Cal. Fish & Game Code §5650 is not applicable because the USA has not waived sovereign immunity for this State of California requirement. While no direct deposition of material is expected to enter into or impact waters of the state, the substantive portions of this standard will be complied with as an ARAR. Any removal action taking place in an area that may impact waters of the state will be conducted in such a way as to ensure that materials dug up will not be released into the water column.

Table A3-2. Potential State Location-Specific ARARs (continued)

Location	Requirement	Prerequisite	Citation ^a	ARAR Determination	Comments
Wetlands	California Fish and Game Commission Wetland Policy (adopted 1987) included in Cal. Fish & Game Code Addenda.	None	Not available	Not an ARAR	Not a potential ARAR. This is not a promulgated requirement. There are adequate ARARs identified for wetlands at Site 29; therefore, this is not a TBC requirement.

Notes:

- 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 follow each general heading; only substantive requirements of the specific citations are considered potential ARARs.

Acronyms/Abbreviations:

- §(§) section(s)
- ARAR applicable or relevant and appropriate requirement
- Cal Code Regs. *California Code of Regulations*
- CERCLA Comprehensive Environmental Response, Compensation, and Liability Act
- CFR *Code of Federal Regulations*
- DFG-OSPR California Department of Fish and Game, Office of Spill Prevention and Response
- FESA Federal Endangered Species Act
- Navy Department of the Navy
- NCP National Oil and Hazardous Substances Pollution Contingency Plan
- TBC to be considered
- tit. title
- USA United States of America

Table A4-1. Potential Federal Action-Specific ARARs

Action	Requirement	Prerequisite	Citation	ARAR Determination			Comments
				A	RA	TBC	
1: No Action 2: SVE with MNA 3: SVE with ZVI Injection 4: SVE with ISB and Groundwater Recirculation							
Resource Conservation and Recovery Act (42 USC §§6901–6991[i])*							
On-site waste generation	Person who generates waste shall determine if that waste is hazardous.	Generator of waste.	Cal. Code Regs. tit. 22, §66262.10(a), 66262.11	2, 3, 4			Substantive provisions are potentially applicable where hazardous waste may be generated.
	Requirements for analyzing waste to determine whether waste is hazardous.	Generator of waste.	Cal. Code Regs. tit. 22, §66264.13(a) and (b)	2, 3, 4			Substantive provisions are potentially applicable where hazardous waste may be generated.
Hazardous waste accumulation	On-site hazardous waste accumulation is allowed for up to 90 days as long as the waste is labeled and dated and stored in containers in accordance with §66262.171–178 or in tanks, on drip pads, inside buildings, etc.	Accumulate hazardous waste.	Cal. Code Regs. tit. 22, §66262.34	2, 3, 4			Substantive provisions are potentially applicable for storing waste on site.
Site closure	Minimize the need for further maintenance controls and minimize or eliminate, to the extent necessary to protect human health and the environment, postclosure escape of hazardous waste, hazardous constituents, leachate, contaminated rainfall or runoff, or waste decomposition products to groundwater, surface water, or the atmosphere.	Hazardous waste management facility.	Cal. Code Regs. tit. 22, §66264.111(a) and (b)		2, 3, 4		

Table A4-1. Potential Federal Action-Specific ARARs (continued)

Action	Requirement	Prerequisite	Citation	ARAR Determination			Comments
				A	RA	TBC	
1: No Action 2: SVE with MNA 3: SVE with ZVI Injection 4: SVE with ISB and Groundwater Recirculation							
Clean closure	During the partial and final closure periods, all contaminated equipment, structures, and soils shall be properly disposed of or decontaminated by removing all hazardous waste and residues.	Hazardous waste management facility.	Cal. Code Regs. tit. 22, §66264.114		2, 3, 4		Substantive provisions are potentially relevant and appropriate for closure.
Container storage	Containers of RCRA hazardous waste must be: <ul style="list-style-type: none"> • maintained in good condition, • compatible with hazardous waste to be stored, and • closed during storage except to add or remove waste. 	Storage in a container of RCRA hazardous waste not meeting small-quantity generator criteria before treatment, disposal, or storage elsewhere.	Cal. Code Regs. tit. 22, §66264.171, 66264.172, and 66264.173	2, 3, 4			Substantive provisions are potentially applicable for storing waste in containers.
	Inspect container storage areas weekly for deterioration.	Storage in a container of RCRA hazardous waste	Cal. Code Regs. tit. 22, §66264.174	2, 3, 4			Substantive provisions are potentially applicable for storing 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% of the volume of containers of free liquids. Remove spilled or leaked waste in a timely manner to prevent overflow of the containment system.	Storage in a container of RCRA hazardous waste not meeting small-quantity generator criteria before treatment, disposal, or storage elsewhere.	Cal. Code Regs. tit. 22, §66264.175(a) and (b)	2, 3, 4			Substantive provisions are potentially applicable for storing waste in containers.

Table A4-1. Potential Federal Action-Specific ARARs (continued)

Action	Requirement	Prerequisite	Citation	ARAR Determination			Comments
				A	RA	TBC	
1: No Action 2: SVE with MNA 3: SVE with ZVI Injection 4: SVE with ISB and Groundwater Recirculation							
	Keep containers of ignitable or reactive waste at least 50 feet from the facility property line.	Ignitable or reactive waste.	Cal. Code Regs. tit. 22, §66264.176				Not an ARAR. Ignitable or reactive waste is not suspected.
	Keep incompatible materials stored near each other separated by a dike or other barrier.	Storage in a container of RCRA hazardous waste	Cal. Code Regs. tit. 22, §66264.177	2, 3, 4			Substantive provisions are potentially applicable for storing waste in containers.
	At closure, remove all hazardous waste and residues from the containment system, and decontaminate or remove all containers and liners.	Storage in a container of RCRA hazardous waste	Cal. Code Regs. tit. 22, §66264.178	2, 3, 4			Substantive provisions are potentially applicable for storing waste in containers.
Clean closure	Remove or decontaminate all waste residues, contaminated containment system components (liners, etc.), contaminated subsoils, and structures and equipment contaminated with waste and leachate, and manage them as hazardous waste. If waste is left on site, closure and postclosure care requirements are necessary.	Surface impoundments, containers or tank liners, and hazardous waste residues or contaminated soil. Not applicable to material treated, stored, or disposed of only before the effective date of the requirements, or if treated in situ or consolidated within the area of contamination.	Cal. Code Regs. tit. 22, §66264.228(a), (b), (e)–(k), (m), and (o)–(q) except as it cross-references procedural requirements such as closure plans and annual reports.		2, 3, 4		Substantive provisions are potentially relevant and appropriate for removal of all waste for clean closure.
Temporary unit	Alternative requirements that are protective of human health or the environment may replace design, operating, or closure standards for temporary tanks and container storage areas.	Temporary storage of RCRA hazardous waste	Cal. Code Regs. tit. 22, §66264.553(b) and (d)–(f)		2, 3, 4		Substantive provisions are potentially relevant and appropriate for temporary storage in containers.

Table A4-1. Potential Federal Action-Specific ARARs (continued)

Action	Requirement	Prerequisite	Citation	ARAR Determination			Comments
				A	RA	TBC	
1: No Action 2: SVE with MNA 3: SVE with ZVI Injection 4: SVE with ISB and Groundwater Recirculation							
Closure with postclosure care	<p>Postclosure care, after completion of closure of the unit and continuing for 30 years after that date, shall consist of at least the following:</p> <p>(A) monitoring and reporting in accordance with the requirements of articles 6, 11, 12, 13, and 14 of this chapter; and</p> <p>(B) maintenance and monitoring of waste containment systems in accordance with the requirements of articles 6, 11, 12, 13, and 14 of this chapter.</p> <p>Any time during the postclosure period, (A) shorten the postclosure care period, or (B) extend the postclosure care period, based on whether the postclosure period is sufficient to protect human health and the environment.</p>	RCRA-permitted land-based unit containing hazardous waste.	Cal. Code Regs. tit. 22, §66264.117(b)(1) and (2)		2, 3, 4		Substantive provisions are potentially relevant and appropriate for leaving waste in place until clean closure or no threat to human health or the environment.

Table A4-1. Potential Federal Action-Specific ARARs (continued)

Action	Requirement	Prerequisite	Citation	ARAR Determination			Comments
				A	RA	TBC	
1: No Action 2: SVE with MNA 3: SVE with ZVI Injection 4: SVE with ISB and Groundwater Recirculation							
Closure with postclosure care (continued)	Postclosure use of property, on or in which hazardous wastes remain after partial or final closure, shall not disturb the integrity of the final cover, liner(s), or other containment system components or the function of the facility's monitoring systems, unless the disturbance is: (1) necessary to the proposed use of the property and will not increase the potential hazard to human health or the environment; or (2) necessary to reduce a threat to human health or the environment. No construction, filling, grading, excavating, or mining shall occur without the issuance of a variance consistent with subsection (d).	RCRA land-based unit containing hazardous waste.	Cal. Code Regs. tit. 22, §66264.117(d)		2, 3, 4		Substantive provisions are potentially relevant and appropriate for leaving waste in place until clean closure or no threat to human health or the environment.
Monitoring	Owners/operators of a RCRA surface impoundment, waste pile, land treatment unit, or landfill shall conduct a monitoring and response program for each regulated unit.	Surface impoundment, waste pile, land treatment unit, or landfill for which constituents in or derived from waste in the unit may pose a threat to human health or the environment.	Cal. Code Regs. tit. 22, §66264.91(a)(1)–(4) and (c), except as it cross-references permit requirements		2, 3, 4		Substantive provisions are potentially relevant and appropriate for a monitoring program.

Table A4-1. Potential Federal Action-Specific ARARs (continued)

Action	Requirement	Prerequisite	Citation	ARAR Determination			Comments
				A	RA	TBC	
1: No Action 2: SVE with MNA 3: SVE with ZVI Injection 4: SVE with ISB and Groundwater Recirculation							
Monitoring 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.	Hazardous waste treatment, storage, or disposal facility.	Cal. Code Regs. tit. 22, §66264.93		2, 3, 4		Substantive provisions are potentially relevant and appropriate for a monitoring program.
Monitoring	The point of compliance is a vertical surface, located at the hydraulically downgradient limit of the waste management area, that extends through the uppermost aquifer underlying the regulated unit.	Hazardous waste treatment, storage, or disposal facility.	Cal. Code Regs. tit. 22, §66264.95(a) and (b)		2, 3, 4		Substantive provisions are potentially relevant and appropriate for a monitoring program.
	Requirements for monitoring groundwater, surface water, and the vadose zone.	Hazardous waste treatment, storage, or disposal facility.	Cal. Code Regs. tit. 22, §66264.97(d), (e)(6), and (e)(12)		2, 3, 4		Substantive provisions are potentially relevant and appropriate for a monitoring program.
	Requirements for a detection monitoring program.	Hazardous waste treatment, storage, or disposal facility.	Cal. Code Regs. tit. 22, §66264.98(e)(1-5), (i), (j), (k)(1-3), (4)(A) and (D),(5), (7)(C) and (D), (n)(1), (2)(B), and (C)		2, 3, 4		Substantive provisions are potentially relevant and appropriate for a monitoring program.

Table A4-1. Potential Federal Action-Specific ARARs (continued)

Action	Requirement	Prerequisite	Citation	ARAR Determination			Comments
				A	RA	TBC	
1: No Action 2: SVE with MNA 3: SVE with ZVI Injection 4: SVE with ISB and Groundwater Recirculation							
Monitoring (continued)	Requirements for an evaluation monitoring program.	Hazardous waste treatment, storage, or disposal facility.	Cal. Code Regs. tit. 22, §66264.99(b), (e)(1)–(6), (f)(3), and (g)		2, 3, 4		Substantive provisions are potentially relevant and appropriate for a monitoring program.
Monitoring	The owner or operator shall establish and implement, in conjunction with the corrective action measures, a water quality monitoring program that will demonstrate the effectiveness of the corrective action program and be effective in determining compliance with the water quality protection standard and in determining the success of the corrective action measures under subsection (c) of this section.	Hazardous waste treatment, storage, or disposal facility.	Cal. Code Regs. tit. 22, §66264.100(d)	2, 3, 4			Substantive provisions are potentially relevant and appropriate for a monitoring program.
Discharge to surface waters, including storm water	Owners and operators of construction activities must be in compliance with discharge standards, including substantive provisions of the general requirements for storm water plans and BMPs.	One or more acres of soil disturbance	CWA §402 (33 USC ch. 26, §1342) and 40 CFR §122.44(k)(2) and (4); 40 CFR 450.21				Not an ARAR since soil disturbance is not expected to be an acre or more.

Table A4-1. Potential Federal Action-Specific ARARs (continued)

Action	Requirement	Prerequisite	Citation	ARAR Determination			Comments
				A	RA	TBC	
1: No Action 2: SVE with MNA 3: SVE with ZVI Injection 4: SVE with ISB and Groundwater Recirculation							
Discharge to surface waters, including storm water	All direct dischargers meet technology-based requirements including the best control technology and the best available technology economically achievable.	One or more acres of soil disturbance	CWA Section 301(b) (33 USC ch. 26, §1311)				Not an ARAR since soil disturbance is not expected to be an acre or more.
Safe Drinking Water Act (42 USC §300[f]–300[j]-26)*							
Injection	The UIC program prohibits injection activities that allow movement of contaminants into underground sources of drinking water that may result in violations of MCLs or adversely affect health.	Underground injection	40 CFR §144.12, excluding the reporting requirements in §144.12(b) and 144.12(c)(1)		3, 4		Injection of ZVI or bioremediation wells would be Class V wells under the UIC program. There are currently no specific technical requirements for injection into Class V wells. Substantive provisions of the UIC rules are relevant and appropriate only to the extent necessary to ensure that reinjection of treated groundwater would not cause the shallow aquifer to violate primary drinking water regulations.
Groundwater treatment	Requirements for the design and installation of new tank systems (e.g., strength, tightness testing, damage control, support, and corrosion control).	Tank systems for transferring, storing, or treating hazardous waste.	Cal. Code Regs. tit. 22, §§66264.192(a)–(c) and (e)–(g)		2, 3, 4		Substantive provisions are potentially relevant and appropriate for SVE treatment of soil gas in tanks.

Table A4-1. Potential Federal Action-Specific ARARs (continued)

Action	Requirement	Prerequisite	Citation	ARAR Determination			Comments
				A	RA	TBC	
1: No Action	2: SVE with MNA	3: SVE with ZVI Injection	4: SVE with ISB and Groundwater Recirculation				
	Requirements for secondary containment of tank systems.	Tank systems for transferring, storing, or treating hazardous waste.	Cal. Code Regs. tit. 22, §§66264.193(b)–(f)		2, 3, 4		Substantive provisions are potentially relevant and appropriate for SVE treatment of soil gas in tanks.
	Requirements for operation of tank systems including spill prevention and prohibitions of material that could cause failure.	Tank systems for transferring, storing, or treating hazardous waste.	Cal. Code Regs. tit. 22, §§66264.194(a) and (b)		2, 3, 4		Substantive provisions are potentially relevant and appropriate for SVE treatment of soil gas in tanks.
	Requirements for inspection of tank systems including inspection of overflow protection, corrosion, release, detection equipment, and cathodic protection.	Tank systems for transferring, storing, or treating hazardous waste.	Cal. Code Regs. tit. 22, §§66264.195(a)–(c)		2, 3, 4		Substantive provisions are potentially relevant and appropriate for SVE treatment of soil gas in tanks.
	Requirements for response to leaks and spills from tank systems (e.g., removal of system from use if appropriate, containment, cleanup, and emergency procedures).	Tank systems for transferring, storing, or treating hazardous waste.	Cal. Code Regs. tit. 22, §§66264.196(b) except (b)(5) and (b)(7)		2, 3, 4		Substantive provisions are potentially relevant and appropriate for SVE treatment of soil gas in tanks.
	Requirements for closure and postclosure care of tank systems decontamination, clean closure, and leaving waste in place at closure.	Tank systems for transferring, storing, or treating hazardous waste.	Cal. Code Regs. tit. 22, §§66264.197(a) and (b)		2, 3, 4		Substantive provisions are potentially relevant and appropriate for SVE treatment of soil gas in tanks.

Table A4-1. Potential Federal Action-Specific ARARs (continued)

Action	Requirement	Prerequisite	Citation	ARAR Determination			Comments
				A	RA	TBC	
1: No Action 2: SVE with MNA 3: SVE with ZVI Injection 4: SVE with ISB and Groundwater Recirculation							
Clean Air Act (42 USC §§7401–7671)*							
Dust emissions	Provisions of State Implementation Plan approved by U.S. EPA under Section 110 of CAA.	Discharge to air	40 USC §7410; portions of 40 CFR §52.220	2, 3, 4			Substantive provisions for the BAAQMD Rules listed below are potentially applicable for the SVE treatment system.
	Apply BACT to any new or modified source that has the potential to emit 10 pounds or more per highest day of precursor organic compounds (POC), non-precursor organic compounds (NPOC), nitrogen oxides (NOx), sulfur dioxide (SO ₂), PM ₁₀ , or carbon monoxide (CO).	Discharge to air	BAAQMD Regulation 2-301	2, 3, 4			Substantive provisions are potentially applicable for the SVE treatment system.
	Any air stripping and SVE operations that emit benzene, vinyl chloride, perchloroethylene, methylene chloride, and/or trichloroethylene shall be vented to a control device that reduces emissions to the atmosphere by at least 90% by weight.	Discharge to air	BAAQMD Regulation 8-47-301	2, 3, 4			Substantive provisions are potentially applicable for the SVE activities.

Table A4-1. Potential Federal Action-Specific ARARs (continued)

Note:

- * 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 Department of the Navy accepts entire statutes or policies as potential ARARs; specific potential ARARs are addressed in the table below each general heading; only substantive requirements of specific citations are considered potential ARARs.

Acronyms/Abbreviations:

§(§) – section(s)
A – applicable
ARAR – applicable or relevant and appropriate requirement
BAAQMD – Bay Area Air Quality Management District
BACT – Best Available Control Technology
CAA – Clean Air Act
Cal. Code Regs. – *California Code of Regulations*
CFR – *Code of Federal Regulations*
ISB – in situ (anaerobic) bioremediation
MCL – maximum contaminant level
MNA – monitored natural attenuation
PM₁₀ – airborne particulate matter, less than 10 micrometers in diameter
RA – relevant and appropriate
RCRA – Resource Conservation and Recovery Act
SVE – soil-vapor extraction
TBC – to be considered
tit. – title
UIC – underground injection control
USC – *United States Code*
U.S. EPA – United States Environmental Protection Agency
ZVI – zero-valent iron

Table A4-2. Potential State Action-Specific ARARs

Action	Requirement	Prerequisite	Citation	ARAR Determination			Comments
				A	RA	TBC	
1: No Action 2: SVE with MNA 3: SVE with ZVI Injection 4: SVE with ISB and Groundwater Recirculation							
State Water Resources Control Board*							
Monitoring	Requires evaluation monitoring once a significant release is detected.	Release detected	Cal. Code Regs. tit. 27, §20425, and tit. 23, §2550.9				Not an ARAR. The release has already been evaluated and this remedial action is the corrective action.
	Requires implementation of corrective action measures that ensure 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.	Release confirmed	Cal. Code Regs. tit. 27, §20430, and tit. 23, §2550.10				Not an ARAR. Not more stringent than federal ARARs identified at Cal. Code Regs. Tit. 22, §66264.100.
Clean Closure	When the discharger has successfully completed clean closure, the landfill shall no longer be subject to the SWRCB-promulgated requirements of this title; otherwise, the discharger shall close the landfill and carry out postclosure maintenance as though the discharger had not attempted clean closure. For the purpose of this paragraph, the discharger shall have successfully clean-closed a landfill only if all waste materials, contaminated components of the containment system, and affected geologic materials (including soils and rock beneath and surrounding the unit and groundwater polluted by a release from the unit) are either removed and discharged to an appropriate unit or treated to the extent that they no longer pose a threat to water quality; and all remaining containment features are inspected for contamination and, if contaminated, discharged in accordance with paragraph (f)(1).	Previous release	Cal. Code Regs. tit. 27, §21090(f)				Not an ARAR. Not more stringent than federal ARARs identified for clean closure at Cal. Code Regs. Tit. 22, §66264.228(a), (b), (e)–(k), (m), and (o)–(q).

Table A4-2. Potential State Action-Specific ARARs (continued)

Action	Requirement	Prerequisite	Citation	ARAR Determination			Comments
				A	RA	TBC	
1: No Action	2: SVE with MNA	3: SVE with ZVI Injection	4: SVE with ISB and Groundwater Recirculation				
Stormwater discharge	NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (General Permit).	Construction that disturbs one or more acres.	SWRCB Order 2009-0009-DWQ, NPDES No. CAS000002				Not an ARAR. This remedial action is not expected to disturb an acre or more of soil.

Note:

- * 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 Department of the Navy accepts the entire statutes or policies as potential ARARs; specific potential ARARs are addressed in the table below each general heading; only substantive requirements of the specific actions are considered potential ARARs.

Acronyms/Abbreviations:

- § – section
- A – applicable
- ARAR – applicable or relevant and appropriate requirement
- BMP – best management plan
- Cal. Code Regs. – *California Code of Regulations*
- CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act
- MNA – monitored natural attenuation
- NPDES – National Pollutant Discharge Elimination System
- RA – relevant and appropriate
- SWRCB – State Water Resources Control Board
- TBC – to be considered
- tit. – title

Attachment

Attachment A1. Department of Fish and Game Identified ARARs Memorandum to Jim Pinasco dated 24 May 2011 and DTSC E-mail Memorandum with List of ARARs dated 16 May 2011

Department of Fish and Game Identified ARARs Memorandum to
Jim Pinasco dated 24 May 2011

Memorandum

Date: May 24, 2011

To: Jim Pinasco, Remedial Project Manager
Department of Toxic Substances Control
8800 Cal Center Drive
Sacramento, CA 95826-3200

From: Carolyn Rech, Staff Environmental Scientist
Department of Fish and Game
Office of Spill Prevention and Response
1700 K Street, Suite 250
Sacramento, CA 95811



Subject: **Identification of State "Applicable" or "Relevant and Appropriate" Requirements (ARARs) for Former Naval Weapons Station Seal Beach Detachment Concord (Concord NWS), Inland Sites Including Installation Restoration (IR) Program Site 29, Contra Costa County (Site #200022).**

This memorandum is in response to your recent request for potential State ARARs for Navy Inland Sites including IR Site 29. The California Department of Fish and Game, Office of Spill Prevention and Response (DFG-OSPR) appreciates the opportunity to provide ARARs for the Former Concord NWS. The DFG is the State's Trustee for fish and wildlife resources pursuant to Fish and Game Code Section 711.7. The DFG is also designated as a Trustee for natural resources pursuant to Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 107 (f)(2)(B). The ARARs provided on the attached table are for the protection of State fish, wildlife and plants and their habitat at Concord NWS, including IR Site 29, and are applicable to all IR, Solid Waste Management Unit, and Munitions Response Program sites.

ARARs were previously provided for Seal Beach Naval Weapons Station, Detachment Concord, Non-Tidal Area Sites via memorandum in 2005 (Gray, 2005). The enclosed table provides an updated, comprehensive list of State natural resource ARARs that apply to all Concord NWS sites. Compliance with these ARARs is applicable to all phases of the CERCLA remediation process.

DFG-OSPR appreciates this opportunity to provide State laws and regulations to guide the planned cleanup of all Concord NWS sites, including Site 29. If you have any questions regarding the subject ARARs or require further details, please contact Carolyn Rech via telephone at 916-327-9961, or via e-mail: crech@ospr.dfg.ca.gov.

Reviewer: Tami Nakahara, Environmental Scientist
Wendy Johnson, Staff Counsel

Reference List

Gray, F. 2005. Memorandum to Jim Pinasco, DTSC. RE: Applicable or Relevant and Appropriate Requirements for the Seal Beach Naval Weapons Station, Detachment Concord, Non-Tidal Area Sites, Contra Costa County (Site 200022). March 9. Sacramento, CA.

cc: Melinda Garvey, Remedial Project Manager
United States Environmental Protection Agency, Region 9
75 Hawthorne St.
San Francisco, CA 94105

John Krause, Associate Wildlife Biologist
California Department of Fish and Game
Bay Delta Region (3)
P.O. Box 47
Yountville, CA 94599

Alan Friedman, P.E., Water Resources Engineer
San Francisco Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 95826

Dan Cordova, Endangered Species
Carolyn Marn, Ph. D., Environmental Contaminants
Sonce de Vries, Environmental Contaminants
U.S. Fish and Wildlife Service
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846

**CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs**

Former Naval Weapons Station Seal Beach Detachment Concord (Concord NWS), Inland Sites Including IR Site 29

LOCATION	STANDARD	SPECIFIC CITATION	ARAR/TBC EXPLANATION
Aquatic habitat/species	Action must be taken if toxic materials are placed where they can enter waters of the State. There can be no release that would have a deleterious effect on species or habitat.	Fish and Game Code section 5650 (a), (b) & (f)	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)), and any substance deleterious to fish, 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. The extent to which each section of 5650 is relevant and appropriate depends on the site characterization and the potential for contaminants to enter state waters. There are numerous State waters on Concord NWS that are near or in CERLA sites where contaminated material may be released into State waters. State waters at Concord NWS include Mount Diablo Creek, Indian Springs Pond, Cistern Pond, vernal pools and numerous un-named creeks, drainages and ponds.
Wildlife Species	Action must be taken to prohibit the taking of birds and mammals, including the taking by poison.	Fish and Game Code section 3005 (Stats. 1957, c. 456, p. 1353 section 3005)	This code section prohibits the taking of birds and mammals, including taking by poison. "Take" is defined by Fish and Game Code section 86 to include killing. "Poison" is not defined in the code. Although there is no state authority on this point, 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, and is relevant and appropriate because birds and mammals will potentially be exposed to contaminated sediments during remedial activities unless efforts are taken to minimize exposure.

**CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs**

Former Naval Weapons Station Seal Beach Detachment Concord (Concord NWS), Inland Sites Including IR Site 29

LOCATION	STANDARD	SPECIFIC CITATION	ARAR/TBC EXPLANATION
Rare native plants	Action must be taken to conserve native plants. There can be no releases and/or actions that would have a deleterious effect on species or habitat.	Fish and Game Code section 1908 (Added by Stats. 1977, c. 1181, p. 3869, section 8)	Section 1908 imposes a substantive requirement by forbidding any “person” to take rare or endangered native plants. California Code of Regulations Title 14 section 670.2 provides a listing of the plants of California that have been declared to be Endangered, Threatened or Rare. 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. Whether the federal government or contractors acting on behalf of the federal government would fall within that definition is a potential issue. To the extent that there are rare or endangered plants on site, section 1908 would be an ARAR. If remedial activities may potentially affect these plants, this code section is relevant and appropriate. Numerous rare or endangered plants that may occur or are known to occur on Concord NWS include, but are not limited to, large-flowered fiddleneck (<i>Amsinckia grandiflora</i>), big tarplant (<i>Blepharizonia plumose</i>), Contra Costa Goldfields (<i>Lasthenia conjugens</i>), and round-leaved filaree (<i>California macrophylla</i>).
Endangered Species	Action must be taken to conserve endangered species. There can be no releases and/or actions that would have a deleterious effect on species or habitat.	Fish and Game Code section 2080 (Added by Stats. 1984, c. 1240, section 2).	This section prohibits the take, possession, purchase or sell within the state, of 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. This section is relevant and appropriate to the extent that there are endangered or threatened species in the area which have the potential of being affected if actions are not taken to conserve the species. Special status species that may be affected by remedial activities include California tiger salamander, Alameda whipsnake, Black Rail, Least Bell’s Vireo, and Swainson’s Hawk. This section prohibits releases and/or actions that would result in take of species. Take may occur if investigatory and/or construction equipment is operating in habitat utilized by these species.

**CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs**

Former Naval Weapons Station Seal Beach Detachment Concord (Concord NWS), Inland Sites Including IR Site 29

LOCATION	STANDARD	SPECIFIC CITATION	ARAR/TBC EXPLANATION
Fully protected bird species/habitat	Action must be taken to prevent the taking of fully protected birds.	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>This section is relevant and appropriate because fully protected birds and/or their habitat including American Peregrine Falcon, California Black Rail, California Clapper Rail, Golden Eagle, and White-tailed Kite may be on or near remedial sites.</p>

**CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs**

Former Naval Weapons Station Seal Beach Detachment Concord (Concord NWS), Inland Sites Including IR Site 29

LOCATION	STANDARD	SPECIFIC CITATION	ARAR/TBC EXPLANATION
Fully Protected Mammals	Actions must be taken to assure that no fully protected mammals are taken or possessed at any time.	Fish and Game Code section 4700 (Added by Stats. 1970, c. 1036, p. 1848 section 6)	<p>This section prohibits the take or possession of any of the fully protected mammals or their parts. The following are fully protected mammals:</p> <ul style="list-style-type: none"> (a) Morro Bay kangaroo rat (b) Bighorn sheep except Nelson bighorn sheep (c) Northern elephant seal (d) Guadalupe fur seal (e) Ring-tailed cat (f) Pacific right whale (g) Salt marsh harvest mouse (h) Southern sea otter (i) Wolverine <p>This section is relevant and appropriate to the extent that such mammals and/or their habitat are located on or near the site. Habitat for the ringtail cat may be near remediation sites.</p>
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	This section 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 section is relevant and appropriate to the extent that nesting birds and/or their habitat are located on or near the site.
Birds of Prey	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)	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 section is relevant and appropriate to the extent that such species and/or their eggs are located on or near the site. Numerous raptors are known to occur at Concord NWS.
Furbearing Mammals	Action must be taken to avoid take.	Title 14 C.C.R. section 460 (effective 07/01/59)	Regulation makes it unlawful to take Fisher, marten, river otter, desert kit fox, and red fox. This section is relevant and appropriate to the extent that these species and/or their habitat are located on or near remedial sites. River otter and red fox may occur at Concord NWS.

**CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs**

Former Naval Weapons Station Seal Beach Detachment Concord (Concord NWS), Inland Sites Including IR Site 29

LOCATION	STANDARD	SPECIFIC CITATION	ARAR/TBC EXPLANATION
Specially Protected Mountain Lion	Action must be taken to avoid injuring, taking, possessing or transporting any mountain lion.	Fish and Game Code sections 4800 et. seq.	Mountain lions are specially protected mammals in California. It is unlawful to take, injure, possess, transport, or sell any mountain lion or any part or product thereof. Violation of this section is a misdemeanor. Concord NWS is within the natural range of mountain lions; therefore they may occur in or near remedial site.
Wetlands	Actions must be taken to assure that there is "no net loss" of wetlands acreage or habitat value. Action must be taken to preserve, protect, restore and enhance California's wetland acreage and habitat values.	Fish and Game Commission Wetlands Policy (adopted 1987) included in Fish and Game Code Addenda	This policy seeks to provide for the protection, preservation, restoration, enhancement and expansion of wetland habitat in California. Further, it opposes any development or conversion of wetland that would result in a reduction of wetland acreage or habitat value. It adopts the USFWS definition of a wetland which utilizes hydric soils, saturation or inundation, and vegetable 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. This policy is not a regulatory program and should be included as a TBC. There are numerous seasonal and perennial wetlands at Concord NWS in or near remedial sites.

CONFIDENTIAL

DTSC E-mail Memorandum with List of ARARs
dated 16 May 2011

Requirement	Citation	Auth	Description	ARA R Status	Comments	Applicable Sites
CHEMICAL-SPECIFIC ARARs						
Non-zero MCLGs (TI Waiver)	40 CFR Part 141	US	Establishes a nonenforceable concentration of a drinking water contaminant that is protective of adverse human health effects and allows an adequate margin of safety.	Rel. and Approp	The NCP states that MCLGs are relevant and appropriate (based upon the circumstances of the release) as groundwater cleanup standards for groundwater and surface water that have been determined to be current or future drinking water sources. Under CERCLA 121(b), Congress states that non-zero MCLGs shall be attained when there is no MCL for the contaminant of concern.	
National Drinking Water Regulations – Primary MCLs (TI Waiver)	40 CFR Part 141	US	Establishes the maximum permissible level of a contaminant in water that is delivered to any user of a public water system. Levels are derived from health-based considerations.	Rel. and Approp	Federal MCLs are superceded by the California MCLs, if the California standards are more stringent.	
National Primary Drinking Water Standards	40 CFR Part 141.61		Maximum contaminant levels and monitoring and analytical requirements for organic chemicals	Rel. and Approp		
Federal Ambient Water Quality Criteria	Clean Water Act § 304	US	Sets criteria for water quality based on toxicity to aquatic organisms and human health.			
Toxic Substances Control Act (TSCA)	40 CFR Parts 750 and 761	US	Regulates PCB-contaminated material	Rel. and Approp	Federal facilities may have regulatory responsibilities under TSCA, including complying with protocol and requirements for sampling and cleanup of PCB spills.	
Drinking Water Primary Standards – Organic and Inorganic Chemicals	CCR, Title 22, Div. 4, Ch. 15, Article 4, § 64431 et seq., and Article 5.5, § 64444 et seq.	CA	Establishes primary MCLs to protect public drinking water supply systems.	Rel. and Approp	These requirements are considered relevant and appropriate where the aquifer is a potential drinking water source and the State MCLs are more stringent than Federal MCLs.	
Drinking Water Secondary	CCR, Title 22, Div. 4, Ch. 15,	CA	Establishes secondary MCLs that shall not be exceeded in water supplied to the public.		Secondary MCLs are not an ARAR because they are not designed to be protective of human health.	

Standards	Article 16, § 64449				They are in place for contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water.	
Water Quality Control Plan	Water Code § 13240	CA	The Porter Cologne Water Quality Act established authority of the SWRCB and RWQCB to regulate discharges into Waters of the State. The Basin Plan establishes discharge limits and procedures to protect water quality. The objective of this plan is to protect the quality of the surface and groundwater.	Applic.		
Policies and Procedures for Investigation and Cleanup and Abatement of Discharges (Containment Zone Policy)	SWRCB Resolution 92-49 (as amended)	CA	Requires cleanups to promote attainment of background levels or the best water quality that is reasonable considering certain factors.	Applic.	If final cleanup levels above background are proposed, justification acceptable to the RWQCB must be provided. Includes provisions for designation of a Containment Zone.	
Calif. Environmental Protection Standard	CCR, Title 22, § 66264.702 et seq.	CA	Sets concentration limits for discharges of contaminants to soil and air from permitted treatment, storage, or disposal facilities.	Applic.	Potentially applicable depending on remedial action.	
California Maximum Contaminant Levels - Organic Chemicals	CCR, title 22, § 64444 – Primary Standards		Provides numerical contaminant limits for certain organic chemicals in drinking water.	Rel and Approp	Applicable if more stringent than the 40 CFR 41.61 standard	

Requirement	Citation	Auth	Description	ARAR Status	Comments	Applicable Sites
LOCATION-SPECIFIC ARARs						
Endangered Species Act of 1973, § 7 (c)	50 CFR 200 and 402	US	Requires formal consultation with the USFWS if activities have the potential to alter the natural environment of listed endangered and threatened species.	Applic.	Endangered or threatened species and/or critical habitat	
National Historic Preservation Act	16 USC § 470 et seq.	US	Requires federal agencies to consider the effect of any federally assisted undertaking or licensing on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places.	Applic.	All Federal sites are potentially eligible for inclusion in the National Register of Historic Places until determined otherwise, per § 106.	
Archeological and Historic Preservation Act	16 USC § 470 et seq.	US	Requires federal agencies to notify the Secretary of the Interior when undertakings will impact significant archeological processes.	Applic.	Significant archeological sites	
Migratory Bird Treaty Act	50 CFR Parts 10 and 20 (16 USC § 703 et seq.)	US	Prevents taking of migratory birds, their nests, or eggs without special permits.	Applic.	Migratory birds	

Executive Order on Flood Plain Management	Executive Order No. 11988	US	Requires federal agencies to evaluate the potential effects of actions they may take in a floodplain to avoid adverse impacts associated with direct and indirect development of a floodplain. Could also potentially require an environmental impact statement for activities that cannot be moved.	Rel. and Approp.	Relevant and appropriate if construction is performed in a floodplain.	
Clean Water Act, (Wetland Protection) and Executive Order 11990 "Protection of Wetlands"	40 CFR Part 230.10, § 404(b)(1) and Executive Order 11990	US	Requires permit from the US Army Corps of Engineers for construction activities in wetlands and alternatives analysis to ensure selection of the least damaging practicable alternative.			
Clean Water Act, (Disposal of Dredged or Fill Material)	40 CFR Parts 230.71 through 230.76	US	Places limitations/ requirements on the management, disposal, and treatment of the dredged or fill material discharged. Applies to sites that contain wetland areas or vernal pools.			
Endangered Species	California Department of Fish and Game (CDFG) Code	CA	Establishes species, subspecies, and varieties of native California plants or animals as endangered, threatened, or rare. Prohibits the taking, importation, or sale of any species, or any part thereof, of an endangered species or a threatened species. Contains provisions concerning CDFG coordination and consultation with state and federal agencies and with project applicants. Recommends avoidance of adverse impacts on species of special concern and their habitat.		Not enforceable at Department of Defense facilities. State protected species will be protected when practicable and the appropriate state authority will be consulted if conflicts arise.	
Wildlife Species/ Habitats	CDFG Code § 1600	CA	Declares the protection and conservation of fish and wildlife to be an important public interest. This section is a general statement of policy that does not impose a substantive requirement.		Not enforceable at Department of Defense facilities. State protected species will be protected when practicable and the appropriate state authority will be consulted if conflicts arise.	

Wildlife Species/ Habitats	CDFG Code §§ 4700, 5050	CA	Prohibits the possession of mammals, reptiles, and fish that are identified as “fully protected.”		Not enforceable at Department of Defense facilities. State protected species will be protected when practicable and the appropriate state authority will be consulted if conflicts arise.	
Rare Native Plants	CDFG Code §§ 1900 et. seq. and 2080	CA	Contain provisions concerning native plant protection including: criteria for determining endangered plant species; designation of endangered plants; and other prohibitions.		Not enforceable at Department of Defense facilities. State protected species will be protected when practicable and the appropriate state authority will be consulted if conflicts arise.	
Location Standards for Owners & Operators of Hazardous Waste Transfer, Treatment, Storage, and Disposal Facilities	CCR, Title 22, Chapter 14, § 66264.18	CA	Establishes siting criteria for waste treatment, storage, or disposal units. Provides location standards including seismic considerations and floodplain restrictions.	Applic.	Applicable if treatment systems manage RCRA hazardous waste in a floodplain.	

Requirement	Citation	Auth	Description	ARA R Statu s	Comments	Applicable Sites
Action Specific ARARs						
Standards Applicable to Generators and Transporters of Hazardous Waste	40 CFR Parts 262 and 263	US	These regulations apply to generators and transporters of hazardous waste within the United States.	Applic.	Applicable if remedial action generates hazardous waste that is then transported off-site.	
Hazardous Air Pollutant Control Requirements	Clean Air Act Amendments, § III	US	Establishes thresholds and content of air emissions.	Applic.	Air emissions resulting from any proposed treatment systems are subject to these requirements.	
Underground Injection Control Program	40 CFR Parts 144-147	US	Protects groundwater from contamination by subsurface emplacement of fluids.	Applic.	Injection of a RCRA hazardous waste resulting from any proposed treatment systems is subject to these requirements.	
Statement of Policy with Respect to Maintaining High Quality of Waters in California (Non-degradation Policy) (TI Waiver)	SWRCB Resolution Number 68-16	CA	Establishes the state's policy for maintaining the quality of water in California higher than that stated in established policies when existing quality is higher. Requires the use of best practical treatment or control of groundwater contaminant plume. May require levels of contaminants lower than state or federal MCLs. Also applies to in-situ discharge of polluted water into un-degraded Waters of the State.	Applic.	If final cleanup levels above background are proposed, justification acceptable to the RWQCB must be provided.	
Waste Discharge Requirements	Porter/Cologne Water Quality Act – California Water Code, Ch. 4, Article 4 and SWRCB Order No.	CA	Requires notification and transmittal of technical reports to the RWQCB of proposed discharges to the Waters of the State. Requires cleanup and abatement of actual or threatened pollution or new source conditions, and establishes waste discharge requirements, among other requirements.	Applic.	Several sites contain impacted groundwater. In addition, cleanup of these sites may involve re-injection of treated groundwater.	

	97-03-DWQ.					
Sources of Drinking Water Policy(TI Waiver)	SWRCB Resolution No 88-63	CA	Defines all ground and surface water as existing or potential sources of drinking water unless TDS are greater than 3,000 ppm, the well yield is less than 200 gpd from a single well, or groundwater is unreasonable to treat using best management practices or best economically achievable treatment practices.	Applic.	The identification of the underlying groundwater as a potential drinking water source provides information to determine concentration limits, cleanup levels, or treatment levels.	
Discharge Prohibitions and Stormwater Pollution Prevention	SWRCB Order 99-08-DWQ	CA	Requires control of stormwater runoff at construction sites that are greater than 5 acres in size.		Implements and enforces the Federal CWA NPDES permit program for regulating discharge of pollutants from construction activities to Waters of the United States.	
Water Quality Monitoring	CCR Title 23 §§ 2550.7 - 2550.10	CA	Requires remedial action monitoring.	Applic.	Groundwater monitoring will be performed.	
Criteria for Identifying Hazardous Waste and Persistent and Bioaccumulative Toxic Substances	CCR, Title 22, Ch. 11, § 66261.24	CA	Presents criteria for testing and identifying RCRA hazardous wastes, sets levels for TTLC and STLC.	Applic.	The criteria and TTLC and STLC levels are applicable for the characterization of excavated soils or other wastes generated by remedial actions.	
Standards Applicable to Generators of Hazardous Waste	CCR, Title 22, §§ 66262.10 and 66262.11	CA	Establishes standards for generators of hazardous wastes in California, including those for hazardous waste determination, manifesting, transportation record keeping, and reporting.	Applic.	Substantive requirements are applicable if excavated soils or treatment residuals exceed RCRA hazardous waste thresholds.	
Management of Extremely Hazardous Wastes	CCR, Title 22, § 67430.3	CA	Requires the removal of improperly disposed extremely hazardous wastes.	Applic.	Applicable to sites where extremely hazardous wastes have been identified.	
Land Disposal Restrictions	CCR, Title 22, § 66268.124, Corrective Management Rule, §§ 66264.91;	CA	Identifies hazardous wastes that are restricted from land disposal.	Applic.	Applicable if excavated soil or treatment residuals exceed limits before treatment. Soil and residuals would be tested using TTLC/STLC to determine if they exceed disposal limits, if necessary. On-site disposal actions may be exempt from treatment standards through the CAMU Rule.	

	66262.100, 66264.708; 66270.30; and 66272.1					
California Integrated Waste Management Requirements	Title 27 CCR, §§ 20510 through 21600	CA	Requirements for waste management units and landfills.	Applic.	Applicable to facilities that receive remedial action-related non-hazardous wastes.	
Standards Applicable to Transporters of Hazardous Waste	CCR, Title 22, Div.4.5, Chapter 13, §§ 66263.10-.18	CA	Establishes standards that apply to persons transporting hazardous waste in California.	Applic.	These requirements must be fully complied with when transporting hazardous waste off-site.	
Air Pollution Control District		CA	Fugitive dust and nuisance dust. Limits on-site activities so fugitive dust at the property line shall not be visible and nuisance dust is abated.	Rel. and Approp.	Relevant and appropriate if grading or soil excavation is performed at a site.	
Air Pollution Control District		CA	Requires that emissions from an air stripper be within acceptable levels.	Rel. and Approp.	Relevant and appropriate if air strippers are part of a treatment unit.	
Discharges of Waste to Land	CCR, Title 23, Chapter 15, § 2520	CA	Regulates the siting, design, construction, operation, closure, and monitoring of waste discharges to land for treatment. Storage and disposal wastes regulated include “hazardous wastes,” “non-hazardous wastes,” and “inert waste.” Includes criteria for diversion and drainage of storm water. Also establishes water quality protection standard for landfills, surface impoundments, waste piles, and land treatment sites.	Rel. and Approp.	Relevant to the on-site disposal of soils following treatment, if proposed.	
Standards for Operators of Hazardous Waste TSDFs - Waste Piles	CCR, Title 22, Div. 4.5, Chapter 14, §§ 66264.250-259.	CA	Regulates the storage and treatment of hazardous waste in piles.	Applic.	Applicable if a RCRA hazardous waste is stored or treated in piles.	

Standards for Operators of Hazardous Waste TSDFs - Miscellaneous Units	CCR, Title 22, Div. 4.5, Chapter 14, §§ 66264.171 - 66264.178, 66264.192 through 66264.199, 66264.552, and 66264.600-603.	CA	Applies to owners and operators of facilities that treat, store, or dispose of hazardous wastes in miscellaneous units. Covers environmental performance standards, monitoring, inspections, and post-closure care for miscellaneous units, containers, and tank systems.	Applic.	Applicable if a RCRA hazardous waste is treated, stored, or disposed of in a miscellaneous unit.	
Landfill Closure Requirements	CCR, Title 27, Division 2, Chapter 3, Subchapters 2, 3, and 5, and Chapter 4, Subchapter 4	CA	Classified waste management units shall be closed according to an approved closure and post-closure maintenance plan, which provides for continued compliance with the applicable standards for waste containment, precipitation, drainage controls, and monitoring. The post-closure maintenance period shall extend as long as the wastes pose a threat to water quality.	Rel. and Approp	More stringent than 40 CFR Part 258 for landfills without liner system.	
Disposal Site Closure and Post-Closure Minimum Standards	CCR, Title 27, Division 3, Chapter 3, Subchapter 4, Article 6, and Chapter 4	CA	Sets forth the performance standards and the minimum substantive requirements for proper closure, post-closure maintenance, and ultimate reuse of solid waste disposal sites to assure that public health and safety and the environment are protected from pollution due to the disposal of solid waste.	Rel. and Approp	More stringent than 40 CFR Part 258 for landfills without liner system.	
Wildlife Species/Habitats	CDFG Code §§ 3005, 3511, and 3513.	CA	Prohibit the taking of birds and mammals. This code section imposes a substantive, promulgated environmental protection requirement.		State protected species will be protected when practicable and the appropriate state authority will be consulted if conflicts arise.	
Land Use Covenants	CCR Title 22, § 67391.1 a, b, & d	CA	States that if a remedy results at levels not suitable for unrestricted use, then the Remedial Action Plan/ Record of Decision is to clearly define and include limitations on land use and hazardous substances remaining on the property.			

Land Use Covenants	Civil Code § 1471, a & b	CA	Allows the state (as non-owners) to enter into restrictive land use covenants with land owners and their successors after determining that protection of present or future human health or safety or the environment is necessary.			
Land Use Covenant	CCR, title 22, § 67391.1(a)		Requires imposition of appropriate limitations on land use by recorded land use covenant when hazardous substances remain on the property at levels that are not suitable for unrestricted use of the land.	Rel and Approp		
Land Use Covenant	CCR, title 22, § 67391.1(b)		Requires that the cleanup decision document contain an implementation and enforcement plan for land use limitations.	Rel and Approp		
Land Use Covenant	CCR, title 22, § 67391.1(d)		Requires that the land use covenant be recorded in the county where the land is located.	Rel and Approp		
Land Use Covenant	CCR, title 22, § 67391.1(i)		Definitions	Rel and Approp		
Land Use Covenant	CA Civil Code § 1471(a) & (b)		Specifies requirements for land use covenants to apply to successors in title to the land.	Rel and Approp		
Monitoring Requirements	CCR, title 27, § 20385		Release monitoring requirements for solid waste management units	Applic.		
General Closure and Post-Closure Maintenance	CCR, title 27, § 20950(a), (e)		General closure and post-closure maintenance standards for solid waste management units	Applic.		
General Post-Closure Maintenance	CCR, title 27, § 21090(b)(1), (c), (e)(2)		Closure and post-closure maintenance requirements for solid waste landfills.	Applic.		
Gas Monitoring and Control During Closure and Post-closure	CCR, title 27, § 20921		Methane must not exceed 5% at the property boundary or other approved monitoring point	Applic.		

Gas Monitoring	CCR, title 27, § 20923		Gas monitoring program required	Applic.		
Perimeter Monitoring Network	CCR, title 27, § 20925		Perimeter subsurface monitoring wells required	Applic.		
Structure Monitoring	CCR, title 27, § 20931		If there are structures, gas monitoring required	Applic.		
Monitored Parameters	CCR, title 27, § 20932		Methane and any specified trace gases must be sampled	Applic.		
Monitoring Frequency	CCR, title 27, § 20933		Quarterly monitoring required, at a minimum	Applic.		
Reporting	CCR, title 27, § 20934		Results of monitoring to be submitted	Applic.		
Control	CCR, title 27, § 20937		Requires gas control system if methane concentrations exceed compliance levels	Applic.		
Post-closure Maintenance	CCR, title 27, § 21180		The landfill's final cover and operating systems must be maintained and monitored for no less than 30 years following closure.	Applic.		
Post-closure Land Use	CCR, title 27, § 21190		Specifies restrictions and considerations in future land use	Applic.		
Water Quality Monitoring	CCR, title 22, § 66264.97		Identifies requirements for water quality monitoring and monitoring systems for owners and operators of hazardous waste facilities	Rel and Approp		

Requirement	Citation	Auth	Description	ARAR Status	Comments	Applicable Sites
TBCs						
USEPA, Region IX PRGs	Not promulgated –Circulated by USEPA Region IX	US	Chemical concentrations in soil, air and water that can be used as screening levels or triggers for further investigation.		PRGs are not promulgated cleanup levels but levels above which further risk characterization is recommended.	
A Compilation of Water Quality Goals and Companion Table “Recommended Numerical Limits to Apply Water Quality Objectives.”	Compiled by Jon Marshack (RWQCB, Central Valley Region). Most recently updated in August 2003.	CA	A report and table prepared to “introduce California’s water quality standards and to outline a system for selecting numerical water quality limits consistent with these standards.” The standards consist of a beneficial use (designated in each Regional Board’s Basin Plan) and water quality objectives to protect those uses. Water quality objectives are numerical or narrative. To aid in selecting numeric limits (concentration levels) for narrative objectives, Marshack has compiled water quality limits from the literature that include “drinking water standards, ambient water quality criteria, cancer risk estimates, health advisories, and other numerical values that represent concentrations of chemicals that would limit specific uses of water (for example, taste and odor thresholds).			
California Designated Level Methodology for Waste Characterization and Cleanup Level Determination	Staff Report, Calif. RWQCB	CA	Proposes a methodology for determining cleanup levels in soil based upon impact to groundwater. Designated waste is defined as non-hazardous waste, which consists of pollutants, which, under ambient environmental conditions, could cause degradation of Waters of the State.		Can be used in determining cleanup levels in soil that are protective of groundwater quality.	
LUFT Field Manual	May 24, 1988 Revised April 5, 1989	CA	Specifies the requirements for removal of USTs and assessment of potential releases of petroleum fuel-related contaminants.		This manual is guidance for considering cleanup goals for petroleum fuel-related contaminants.	
State Action Levels	DHS/ Office of	CA	Numeric limits (concentration levels) that are		DHS action levels are used as triggers to	

	Drinking Water Criteria		designed to protect human health from contaminants in drinking water.		implement corrective actions for public water systems.	
California Water Code - State of California Dept. of Water Resources	§ 13800 (Water Well Standards Supplemental Bulletin 74-90)	CA	As required by § 13800 of the California Water Code, the DWR prepared a Water Well Standards Supplemental bulletin 74-90 which sets standards for the construction and abandonment of water wells.		These guidelines will be considered if actions involve construction or abandonment of water wells.	

MEC Remediation ARARs

Requirement	Citation	Auth	Description	ARAR Status	Comments	Applicable Sites
Location Specific						
California Endangered Species Act	Fish and Game Code §§ 2051et seq.; §2080	CA	The statute sections provide a declaration of policy and definitions. Section 2080 provides that no person shall take, possess, purchase, or sell within this state, any species, or any part or product thereof, that the commission determines to be an endangered species or a threatened species, or attempt any of those acts.	Rel and Approp. (1,2,3)/ Location	Section 2080 includes specific standards of control with respect to the taking of endangered or threatened species. The Army will need to coordinate the development of any plans with CDFG. Mitigation measures to protect both State and Federal, rare, threatened and endangered species will need to be identified and actions implemented during the Army's action of MEC remediation if selected for implementation.	
California Fish and Game Code	§3511	CA	This statute section prohibits taking or possessing fully protected birds or parts thereof, listed as: (a) American peregrine falcon (<i>Falco peregrinus anatum</i>) (b) Brown pelican (c) California black rail (<i>Laterallus jamaicensis coturniculus</i>) (d) California clapper rail (<i>Rallus longirostris obsoletus</i>) (e) California condor (<i>Gymnogyps californianus</i>) (f) California least tern (<i>Sterna albifrons browni</i>) (g) Golden eagle (h) Greater sandhill crane (<i>Grus canadensis tabida</i>) (i) Light-footed clapper rail (<i>Rallus longirostris levipes</i>) (j) Southern bald eagle (<i>Haliaeetus leucocephalus leucocephalus</i>) (k) Trumpeter swan (<i>Cygnus buccinator</i>) (l) White-tailed kite (<i>Elanus leucurus</i>) (m) Yuma clapper rail (<i>Rallus longirostris yurnanensis</i>).	Rel and Approp. (1,2,3)/ Location	The requirement includes specific standards of control that may apply to the American peregrine falcon (some possibility), golden eagle (slight possibility), brown pelican (not likely but possible), and California least tern (not likely but possible). Vegetation clearance activities should occur outside the nesting seasons for these protected birds.	
California Fish and Game Code	§3513	CA	This statute section declares that it is 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 Treaty Act.	Rel and Approp. (1,2,3)/ Location	The requirement includes specific standards of control.	
California Fish and Game Code	§3503.5	CA	This statute section prohibits the take, possession or destruction of any birds in the orders of Falconiformes or Strigiformes, or to take, possess, or destroy the nest or eggs of any such bird, except as provided in the code.	Rel and Approp. (1,2,3)/ Location	The requirement includes specific standards of control.	
California Fish and Game Code	Title 14, CCR §472	CA	This regulation limits the taking of nongame birds and mammals except for specified species.	Rel and Approp. (1,2,3)/ Location	The requirement includes specific standards of control.	
California Fish and Game Code	§4800 et. seq	CA	This statute section declares that it is unlawful to take, injure, possess, transport or sell any mountain lion.	Rel and Approp. (1,2,3)/ Location	The requirement includes specific standards of control. Due to the size of vegetation clearance and MEC remediation activities that may be selected for implementation, it is unlikely that mountain lions will be negatively affected. In fact, the use of fire to set back plant community succession will result in an improvement to wildlife habitat that will benefit mountain lions	
Endangered Species Act (16 USC §§ 1531 1543	16 USC §1536 (a) and (c); 16 USC §1538 (a)(l)	US	Federal agencies are required under Section 7 of the ESA to ensure that their actions do not jeopardize the continued existence of a listed species or result in destruction of or adverse modification of its critical habitat(16 USC § 1536). If the proposed action may affect the listed species or its critical habitat, consultation with the USFWS and/or California Fish and Game may be required (50 CFR § 402.14). Additionally, Section 9 of the ESA prohibits the illegal taking of a listed species (16 USC I	Applic. (1,2,3)/ Location		

			538(a)(1).			
Migratory Bird Treaty Act (MBTA)	16 IJ5C §§ 703-712	CA	The statute sections prohibit the taking, possession of, buying, selling, purchasing, or bartering of any migratory bird, including feathers or other parts, nest eggs, or products, except as allowed by regulations.	Applic. (1,2,3)/ Location		
Action Specific						
California Health and Safety Code	Title 22, CCR §66264.601-603	CA	These regulations apply to hazardous waste treatment which is conducted in a device that does not meet the definition of a "container" in 22 CCR 66260.10 is characterized as a "Miscellaneous Unit" subject to the provisions of 22 CCR 66264.60 1-603. For activities where detonations are in a device that meet the 22 CCR 66260.10 definition of a container, the requirements for "temporary units," as set forth in 22 CCR 66264.553 apply.	Rel and Approp. (2) / Action	The regulations include generally described narrative standards. Compliance with substantive requirements is achieved through regulatory coordination of site-specific work plan and Detonation Sampling and Analysis Plan with EPA and DTSC in accordance with CERCL	
California Fish and Game Code	§ 1900 et. seq.	CA	These Statute sections sets forth programmatic and administrative provisions, and in § 1908, provides that no person shall import into the state, or take, possess, or sell within this state, except as incident to the possession or sale of the real property on which the plant is growing, any native plant, or any part or product thereof, that the commission determines to be an endangered native plant or rare native plant	Rel and Approp. (1,2,3)/ Action	The standards of control are relevant and appropriate, and the citation is therefore considered as ARAR.	
California Fish and Game Code	Title 14, CCR §783 et. seq.	CA	These regulations provide that no person shall import into the State, export out of the State or take, possess, purchase, or sell within the State, any endangered species, threatened species, or part or product thereof, or attempt any of those acts, except as otherwise provided in the California Endangered Species Act, Fish and Game Code Section 2050, et seq. ("CESA"), the Native Plant Protection Act, the Natural Community Conservation Planning Act, the California Desert Native Plants Act, or as authorized under this article in an incidental take permit. The regulations also provide programmatic and administrative procedures for incidental take permits	Rel and Approp. (1,2,3)/ Action	The standards of control are relevant and appropriate, and the citation is therefore considered as ARAR.	
California Clean Air Act (Health and Safety Code)	Title 17, CCR §80 100 et. seq.	CA	The regulations provide guidelines, programs and agency procedures for smoke management plans.	Rel and Approp. (1)/Action	The regulations are relevant and appropriate. The Army will comply with substantive elements of the regulations if this type of works proceeds.	
Chemical and Action Specific						
California Health and Safety Code, Division 20	Title 22, CCR Division 4.5	CA	The statute and regulations provide for identification of hazardous waste in §66261. If a material is a hazardous waste, Division 4.5 provisions further regulate hazardous waste generators, transporters, and treatment, storage, and disposal facilities.	Applic. (3) / Chemical and Action	The Army will evaluate discovered items in accordance with the approved programmatic work plan to determine the presence of energetic materials or other constituents that would cause it to be characterized as a hazardous waste. Substantive requirements: <ul style="list-style-type: none"> ▪ Storage: onsite storage of MEC items occur in a designated bunker that meets the standard of DDESB 6055.9 STD, including security measures such as fences, signs, and an alarm system. ▪ Transportation: offsite transportation of small arms ammunition and subcaliber MEC items will incorporate applicable manifesting and placarding requirements. Conforms to Defense Reutilization and Marketing Office (DRMO) instruction. ▪ Disposal/recycling: offsite disposal or recycling facility or facilities for small arms ammunition and subcaliber MEC items will be state and/or RCRA-authorized. 	

California Health and Safety Code	Title 22, CCR §66265.382	CA	<p>Open burning of hazardous waste is prohibited except for the open burning and detonation of waste explosives. Waste explosives include waste which has the potential to detonate and bulk military propellants which cannot safely be disposed of through other modes of treatment. Detonation is an explosion in which chemical transformation passes through the material faster than the speed of sound (0.33 kilometers/second at sea level). Owners or operators choosing to open burn or detonate waste explosives shall do so in accordance with the following table and in a manner that does not threaten human health or the environment.</p> <p>lb. waste explosives</p> <p>Min. Distance from OB/OD to property</p> <p>0 to 100 204 meters (670 feet)</p> <p>101 to 1,000 380 meters (1,250 feet)</p> <p>1,001 to 10,000 530 meters (1,730 feet)</p> <p>10,001 to 30,000 690 meters (2,260 feet)</p>	Rel and Approp. (3)/Chemical and Action	The requirement includes specific standards of control and addresses situations similar to those that may be addressed under Additional MEC Remediation. If this alternative is selected for implementation, the actions taken will comply with these requirements.	
Hazardous Materials & Transportation Act	49 CFR Part 172.101	CA	These regulations impose procedures and controls on the transportation of hazardous materials,	Applic. (3) / Chemical and Action	The regulations include specific standards of control and substantive requirements, criteria and limitations that may apply to the transport of detonation materials and Selected recyclable ordnance materials.	
Federal Resource Conservation and Recovery Act (RCRA), Subpart M (Military Munitions Rule)	40 CFR Parts 266 and 270	US	The regulations identify when military munitions become a solid waste, and if these wastes are hazardous, the management standards apply.	Rel and Approp. (2, 3) / Chemical and Action	The rule is relevant and appropriate, particularly with regard to management of MEC that is determined to be a hazardous waste. The rule provides for the transportation and storage of waste military munitions in accordance with DDESB standards.	

1 = Vegetation Clearance; 2 = MEC Remediation; 3 = Detonation of MEC

MEC Remediation**Potential Applicable or Relevant and Appropriate Requirements (ARARs)**

Source or Authority	Requirement Standard or Criterion	Type	Description	Remarks
Regulations that were considered as potential ARARs but were not considered applicable.				
California Fish and Game Code	§3005		The statute section prohibits the taking of birds or mammals, except non-game mammals, with any net, pound, cage, trap, set line or wire, or poisonous substance. Included in the term "taking" is the killing of birds or mammals by poison.	Birds and mammals will be protected by achieving the identified Remedial Action Objectives (RAOs). Further, the scope of the remedial actions does not include intentional taking of birds and mammals with unlawful devices.
California Fish and Game Code	§4000 et. seq.		This statute section provides that a fur-bearing mammal may be taken only with a trap, firearm, bow and arrow, poison under a proper permit, or with the use of dogs.	The scope of the remedial actions does not involve intentional taking of fur-bearing mammals with unlawful devices.
California Fish and Game Code	Title 14, CCR §460		This regulation makes it unlawful to take Fisher, marten, river otter, desert kit fox and red fox.	The remedial actions will not result in the take of Fisher, marten, and river otter.
California Clean Air Act	Health and Safety Code §41701		This statute section prohibits the discharge into the atmosphere from any source whatsoever any air contaminant for a period or periods aggregated more than three minutes in any one hour which is dark or darker than No. 2 on the Ringelmann Chart or obscures the view to a degree equal to or greater than smoke.	

Solid Waste Disposal Site Excavation and Consolidation ARARs

Source	Standard, Requirement, Criterion, or Limitation	Aut h	Description	ARA R Status	Comment	Associated Site
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20435 Div. 2, Subdiv. 1, Ch. 3, Subch. 3, Art. 1., § 20435, Water Quality Monitoring and Response Programs	CA	Unsaturated Zone Monitoring and Response: methodology for establishing a background value for each monitoring parameter and each COC and for detecting any increase.			
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20510(a) Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1., § 20510(a), Disposal Site Operating Records	CA	Weigh/Volume Records: the weight or volume of waste accepted must be determined loan accuracy of ±10%	Applic.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20510(b) Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1., § 20510(b), Disposal Site Operating Records	CA	Excavation Records: records shall be maintained for excavations which rosy effect the Safe and proper operation of the site or cause damage to adjoining properties.	Applic.	Applies to solid waste disposal Sites as defined by Public Resources Code Section 40122.	For consolidation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030.	27 CCR 20530 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1, § 20530, Site Security	CA	Site Security: the site shall be designed to discourage unauthorized access by persons or vehicles by using a perimeter barrier or topographic constraints. Areas within the site where open storage or ponding of hazardous materials occurs shall be separately fenced.	Applic.	Applies to solid waste disposal Cites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020,43021 and 43030	27 CCR 20540 Div. 2, Subdiv. 1, Ch. 3, Subdiv. 4, Art. 1, § 20540, Roads	CA	Roads: landfill roads must minimize dust and tracking of materials onto public roads, Such roads shall be kept in safe condition and maintained such that vehicle access and unloading can be conducted during inclement weather.	Applic.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation end excavation sites
California integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20630 Div. 2, Subdiv. 1, Ch. 3, Subdiv. 4, Art. 1, § 20630, Confined Unloading	CA	Confined Unloading: Unloading of solid wastes shall be confined to as small an area as possible without resulting in traffic, personnel or public safety hazards. Requires normal deposition of waste at toe of fill..	Applic..	Applies to solid waste disposal sites as defined by Public Resources Code. Section 40122,	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20640 Div. 2, Subdiv. 1 Ch. 3, Subdiv. 4, Art. 1, § 20640, Spreading and Compacting	CA	Spreading and Compacting: Requires Spreading and compacting of refuse in layers.	Applic.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites.
California Integrated Waste Management Act of 1989 PRC 40502,43020, 43021 and 43030	27 CCR 20650 Div. 2, Subdiv. 1, Ch. 3, Subdiv. 4, Art. 4, § 20650, Grading of Flu Surface	CA	Grading of Fill Surface: Covered surfaces of the disposal area shall be graded to promote firm-off and prevent ponding, accounting future settlement.	Applic.	Applies to solid waste disposal Sites as defined by Public Resources Code. Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20660 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1, § 20660, Stockpiling.	CA	Stockpiling: Requires stockpiled cover material and unsuitable native materials to be placed so as not to cause problems or interference with site operations.	Applic.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20700 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1, Sec. 20100, intermediate Cover	CA	Intermediate Cover: Requires compacted earthen material of at least 12 inches on all surfaces of the fill where no additional solid waste will be deposited within 180 days.	Applic.	Applies to Solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California integrated Waste Management Act of 1989 PRC 40802. 43020, 43021 and 43030	27 CCR 20710(a) Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1, Sec. 20710(a), Scavenging, Salvaging and Storage	CA	Scavenging: Scavenging Is prohibited.	Applic.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122,	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40602, 43020, 43021 and 43030	27 CCR 20710(b) Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1 Sec. 20710(b), Scavenging, Salvaging and Storage	CA	Salvaging Permitted: Salvaging is permitted in a planned and controlled manner,	Applic.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20710(c) Div. 2, Subdiv. 1, Ch. 3. Subch. 4, Art. 1, Sec. 20710(c), Scavenging, Salvaging and Storage	CA	Storage of Salvage: Salvage material must be safely isolated for storage,	Applic.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	Fr consolidation and excavation sites

California integrated Waste Management Act of 1989 PRC 40502, 43020,43021 and 43030	27 CCR 20710(c) Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1, Sec. 20710(c), Scavenging, Salvaging and Storage	CA	Removal: Storage time for salvage materials shall be limited to a duration specified by the enforcement agency.	Applic.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20720 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1, Sec. 20720, Non-Salvageable Items	CA	Non-Salvageable items: items capable of Impairing public health shall not be salvaged without approval by the agencies,	Applic.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California integrated Waste Management Act of 1989 PRC 40802, 43020, 43021 and 43030	27 CCR 20730 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1, Sec. 20730, Volume Reduction & Energy Recovery	CA	Volume Reduction and Energy Recovery: Volume reduction and energy recovery are permitted in planned and controlled manners. Processing area shall be confined to specified, clearly identifiable areas of the site.	Applic.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavations tea
California Integrated Waste Management Act of 1989 PRC 40502, 43020.43021 and 43030	27 CCR 20780 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1, Sec. 2071 0(c), Nuisance Control	CA	Nuisance Control: Each site shall be operated and maintained so as not to create a public nuisance.	Applic.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation Sites
California Integrated Waste Management Act of 1989	27 CCR 20780(b) Div. 2, Subdiv. 1, Div. 3, Subch. 4, Art. 4, Sec.	CA	Burning Wastes: Burning wastes shall be extinguished.	Applic.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
PRG 40502, 43020, 43021 and 4303.0	20780(b), Open Burning & Burning Wastes	CA				
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 end 43030	27 CCR 20790 Div. 2, Subdiv. 1, Div. 3, Subch. 4, Art. 1, Sec. 20790, Nuisance Control	CA	Leachate Control: The operator shall ensure that leachate is controlled to prevent contact with the public.	Applic.	The state does not intend that subsurface leachate monitoring and collection systems need to be installed at existing sites unless there is evidence of leachate production and/or accumulation. Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 COR 20800 Div. 2, Subdiv. I Ch. 3, Subch. 4, Art. 4, Sec. 20800, Dust Control	CA	Dust Control: The operator shall take adequate measures to minimize the creation of dust and prevent safety hazards due to obscured visibility.	Applic.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20610 Div. 2, Subdiv. 1, Oh. 3, Subch. 4, Art. 4, Sec. 20810, Dust Control	CA	Vector and Bird Control: The operator shall take adequate measures to Control or prevent the propagation harborage, or attraction of flies, rodents, or other vectors, and to minimize bird problems.	Applic.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California integrated Waste Management Act of 1989 PRO 40502, 43020, 43021 and 43030	27 OCR 20820 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 4, Sec. 20820, Drainage end Erosion Control	CA	Drainage And Erosion Control: The drainage system shall be designed and maintained to: ensure integrity of roads, structures, and gas monitoring and control systems; prevent safety hazards; and prevent exposure of waste.	Applic.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 OCR 20830 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 4, Sec. 20830, Grading of Fill Surface	CA	Liter Control: Litter and loose materials shall be routinely collected and disposed of properly,	Applic.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 OCR 20919 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 6, Sec. 20919, Gas Control	CA	Gas Control: The operator shall cause the site to be monitored for the presence and movement of landfill gas and take any necessary action to control such gases In the event that the gas causes a hazard or nuisance.	Applic.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 OCR 20919.5 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 6, Sec. 20919, Gas Control	CA	Explosive Gas Control: The concentration of methane gas generated by the facility must not exceed 25 percent of the lower explosive limit. Monitoring, reporting, and mitigation requirements.			
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 OCR 21090 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 6, Sec. 20919, Gas Control	CA	Final Cover Requirements: Construction of Cover's Layers, Grading Requirements, General Duties, Establishing baseline topography and tracking settlement.		Closure and Post-Closure Maintenance Requirements for Solid Waste Landfills	
California Integrated Waste Management Act of 1989 PRC	27 CCR 21600 Div. 2, Subdiv. I, Ch. 4, Subch. 3, Art. 2, Sec. 21600,	CA	Report of Disposal Site information The planning and procedural requirements necessary to ensure that solid waste Is handled and	Rel and Approp.	Applies to operating solid waste disposal sites as defined by Public Resources Code Section	For consolidation sites

40502, 43020, 43021 and 43030	Report of Disposal Site Info		disposed in manners that protect public health and safety and the environment most be conducted.		40122	
California Integrated Waste Management Act of 1989 PRC 40502 & 43020	27 CCR 21130 Ch. 3 Subch. 5, Art. 2, Closure & Postclosure Maint. Standards for Disposal Sites and Landfills	CA	Emergency Response: potential emergency conditions that may exceed the design of the site and could endanger the public health or environment must be anticipated. Response procedures for these conditions must be addressed in the RD/RA plans.	Applic. or Rel and Approp.	Closure or Postclosure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2. Scope & Applicability pursuant 27 CCR 21100.	For closing sites
California Integrated Waste Management Act of 1989 PRC 40502 & 43020	27 CCR 21135 Ch. 3, Subch. 5, Art. 2, Closure & Postclosure Maint. Standards for Disposal Sites and Landfills	CA	Site Security: all points of access to the site must be restricted, except permitted entry points. All monitoring, control, and recovery systems shall be protected from unauthorized access.	Applic. or Rel and Approp.	Closure or Postclosure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2. Scope & Applicability pursuant 27 CCR 21100	For closing sites
California Integrated Waste Management Act of 1989 PRC 40502 & 43020	27 CCR 21137 Ch. 3, Subch. 5, Art. 2, Closure & Postclosure Maint. Standards for Disposal Sites and Landfills	CA	Structure Removal: site structures and leachate and gas control systems not Intended for reuse will be dismantled and removed at the time of closure to protect public health and safety.	Applic. or Rel and Approp.	Closure or Postclosure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2. Scope & Applicability pursuant 27 CCR 21100	For closing sites
California Integrated Waste Management Act of 1989 PRC 40502 & 43020	27 CCR 21140 Ch. 3, Subch. 5, Art. 2, Closure & Postclosure Maint. Standards for Disposal Sites and Landfills	CA	Final Cover: the final cover shall function with minimum maintenance and provide waste containment to protect public health and safety by controlling at a minimum, vectors fire, odor, litter and landfill gas migration. The final cover shall also be compatible with postclosure land use.	Applic. or Rel and Approp.	Closure or Postclosure Maintenance Standards for Disposal Silas and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2. Scope & Applicability pursuant 27 CCR 21100	For closing sites
California Integrated Waste Management Act of 1989 PRC 40502 & 43020	27 CCR 21142 Ch. 3, Sub. 5, Article 2, Closure & Postclosure Maint, Standards for Disposal Sites and Landfills	CA	Final Grading: final grades must be designed and maintained to reduce Impacts 10 health and safety and take Into consideration any postclosure land use.	Applic. or Rel and Approp.	Closure or Postclosure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2. Scope & Applicability pursuant 27 CCR 21100	For closing sites
California Integrated Waste Management Act of 1989 PRC 40502 & 43020	27 CCR 21145 Ch. 3, Subch. 5, Art. 2, Closure & Postclosure Maint. Standards for Disposal Sites and Landfills	CA	Slope Stability: the operator shall ensure the integrity of final slopes under both static and dynamic conditions to protect public health & safety and prevent damage to postclosure land uses, roads, structures, utilities, gas monitoring and control systems, leachate collection and control systems to prevent public contact with leachate, and prevent exposure of waste.	Applic. or Rel and Approp.	Closure or Postclosure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2. Scope & Applicability pursuant 27 CCR 21100.	For closing Sites
California Integrated Waste Management Act of 1989 PRC 40502 & 43020	27 CCR 21150 Ch. 3. Subch. 5, Art. 2, Closure & Postclosure Maint. Standards for Disposal Sites and Landfills	CA	Drainage and Erosion Control: the drainage and erosion control system shall be designed and maintained to ensure Integrity of postclosure land uses, roads, and structures; to prevent public contact with waste and leachate; to ensure Integrity of gas monitoring and control systems; to prevent safety hazards: and to prevent exposure of waste.	Applic. or Rel and Approp.	Closure or Postclosure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Sub. 5, Art. 2. Scope & Applicability pursuant to 27 CCR 21100	For closing sites
California integrated Waste Management Act of 1989 PRC 40502 & 43020	27 CCR 21160 Ch 3, Sub. 5, Article 2, Closure & Postclosure Maint. Standards for Disposal Sites and Landfills	CA	Landfill Gas Control and Leachate Contact: landfill gas control shall be Implemented and maintained; leachate must be collected and controlled in a manner which prevents public contact and controls vectors, nuisance and odor.	Applic. or Rel and Approp.	Closure or Postclosure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2, Scope & Applicability pursuant 27 CCR 21100. The state does not intend that subsurface leachate monitoring and collecting systems need to be added to existing landfills unless leachate production and/or accumulation is evident.	For closing sites
California Integrated Waste Management Act of 1989 PRC 40502 & 43020	27 CCR 20921-20937 Ch. 3, Sub. 4, Article 6, Closure & Postclosure Maint Standards for Disposal Sites and Landfills	CA	Gas Monitoring and Control During Closure and Postclosure; In protect public health and safety end the environment, landfill gases generated at a disposal site will be controlled to ensure that 1) concentrations to methane gas do not exceed 1 .25% by volume In air within on-site structures. 2) concentrations of methane do not exceed 5% by volume In air at the property or designated landfill boundary arid 3) trace gases do not pose en acute or chronic exposure to toxic or carcinogenic compounds	Applic. or Rel and Approp.	Closure or Postclosure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3. Subch. 5, Art. 2, Scope & Applicability pursuant 27 CCR 21100	For dosing sites

California Integrated Waste Management Act of 1989 PRC 40502 & 43020	27 CCR 20950 Ch. 3, Sub. 4, Article 6, Closure & Postclosure Maint Standards for Disposal Sites and Landfills	CA	General Requirements: Supervision by registered civil engineer or certified engineering geologist, placement of surveying monuments, Establishing Financial Responsibility for Maintenance Period.			
California Integrated Waste Management Act of 1959 PRC 40502 & 43020	27 CCR 21180 Ch. 3, Sub. 5, Article 2, Closure & Postclosure Maint Standards for Disposal Sites and Landfills	CA	Postclosure Maintenance; the landfill must be maintained and monitored for no less than 30 years following closure.	Applic. or Rel and Approp.	Closure or Postclosure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2, Scope & Applicability pursuant 27 CCR 21100,	For closing sites
California Integrated Waste Management Act of 1989 PRC 40602 & 43020	27 CCR 21190 Ch. 3, Sub. 5, Article 2, Closure & Postclosure Maint. Standards for Disposal Sites and Landfills	CA	Postclosure Land Use; Site Closure Design shall show one or more proposed uses of the closed site or show development that is compatible with open space. Changes In Postclosure land use must be approved by the appropriate State agency prior to Implementation.	Applic. or Rel and Approp.	Closure or Postclosure Maintenance Standards for Disposal Sites and Landfills of 27 OCR, Ch. 3, Subch. 5, Art. 2, Scope & Applicability pursuant 27 CCR 21100	For dosing sites
California Integrated Waste Management Act of 1989 PRC 40502 & 43509	27 CCR 21800 Ch. 4, Subch. 4. Final Closure Plans Contents	CA	Provides the content requirements for closure plans for solid waste disposal sites.	Rel and Approp.	Applies to solid waste disposal sites that received waste after November 1990, Relevant and appropriate for closing sites that did not receive waste after November 1990	For closing sites
California Integrated Waste Management Act of 1989 PRC 40502 & 43609	27 CCR 21830 Ch. 4, Subch. 4, Final Closure Plan Contents	CA	Provides the content requirements for Postclosure maintenance plans for solid waste disposal sites,	Rel and Approp.	Applies to solid waste disposal sites that received waste after November 1990. Relevant and appropriate for closing sites that did not receive waste after November 1990.	For dosing sites
California Integrated Waste Management Act of 1989 PRC 40502 & 43509	27 CCR 21880 Ch. 4, Subch. 4. Final Closure Plan Contents	CA	Provides the content requirements to obtain certification that the solid waste disposal site has closed pursuant to state standards.	Rel and Approp.	Applies to solid waste disposal sites that received waste after November 1990. Relevant and appropriate for closing sites that did not receive waste after November 1990	For closing sites

ARARs	Applicable or Relevant and Appropriate Requirements
CAMU	Corrective Action Management Unit
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Contaminates of Concern
CWA	Clean Water Act
DHS	Department of Health Services
DWR	Department of Water Resources
EPA	Environmental Protection Agency
et seq	et sequentes (and the following)
gpd	gallons per day
LUFT	Leaking Underground Fuel Tank Manual
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
NCP	National Contingency Plan
NPDES	National Pollutant Discharge Elimination System
PCB	polychlorinate biphenyl
ppm	parts per million
PRG	Preliminary Remediation Goal
RCRA	Resource Conservation and Recovery Act
RWQCB	Regional Water Quality Control Board
STLC	soluble threshold limit concentration
SWRCB	State Water Resources Control Board
TBC	To-Be-Considered
TDS	Total Dissolved Solids
TSCA	Toxic Substances Control Act
TSDF	Transfer, Storage and Disposal Facility
TTLC	total threshold limit concentration
USC	United States Code
USTs	underground storage tanks