FACT SHEET

Five-Year Review of Alameda Point and Fleet and Industrial Supply Center Oakland, Alameda Facility/Alameda Annex Alameda, California

November 2011

The Five-Year Review is an evaluation of in-place remedies at contaminated sites to determine if they are protective of human health and the environment. This fact sheet summarizes the Five-Year Review process, why it is performed, and the results of the review at Alameda Point.

The Five-Year Review concluded that the remedies put in place at Alameda Point continue to adequately protect human health and the environment. The entire Five-Year Review Report is available to the public at the information repositories listed on the last page. Additional information about the final Five–Year Report and other Department of the Navy cleanup activities is available online at: http://www.bracpmo.navy.mil.

ENVIRONMENTAL HISTORY / BACKGROUND

Both installations, the Former Naval Air Station Alameda (a.k.a. Alameda Point) and the Fleet and Industrial Supply Center Annex (FISCA) are located on the western tip of Alameda Island in the City of Alameda, California. From the late 1800s to the 1960s, most of this land was created by filling subtidal areas, natural tidelands, marshlands, and sloughs with dredge materials from the surrounding San Francisco Bay, Seaplane Lagoon, and Oakland Inner Harbor.

ALAMEDA POINT

In 1936, the United States Government purchased 1,000 acres from the City of Alameda to construct Alameda Point. Today, Alameda Point consists of 2,675 acres of land (1,560 uplands and 1,115 submerged) due to the Navy acquiring adjacent land, and filling additional subtidal areas, natural tidelands, marshlands, and sloughs. It is bordered on the north by the Oakland Inner Harbor, on the west and south by San Francisco Bay and the east by the remaining two-thirds of the City of Alameda, including FISCA.

The Navy began investigations of Alameda Point's contaminated sites in 1982. Alameda Point was added to the National Priorities List (NPL) in July 1999 under the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA). When Alameda Point was placed on the NPL, responsibility for managing the cleanup program passed to the Base Realignment and Closure (BRAC) Cleanup Team (BCT). The BCT for Alameda Point consists of representatives from the Navy, the United States Environmental Protection Agency (USEPA), California Department of Toxic Substances Control, and the Regional Water Quality Control Board.

*NOTE: Italics indicate terms defined in glossary.

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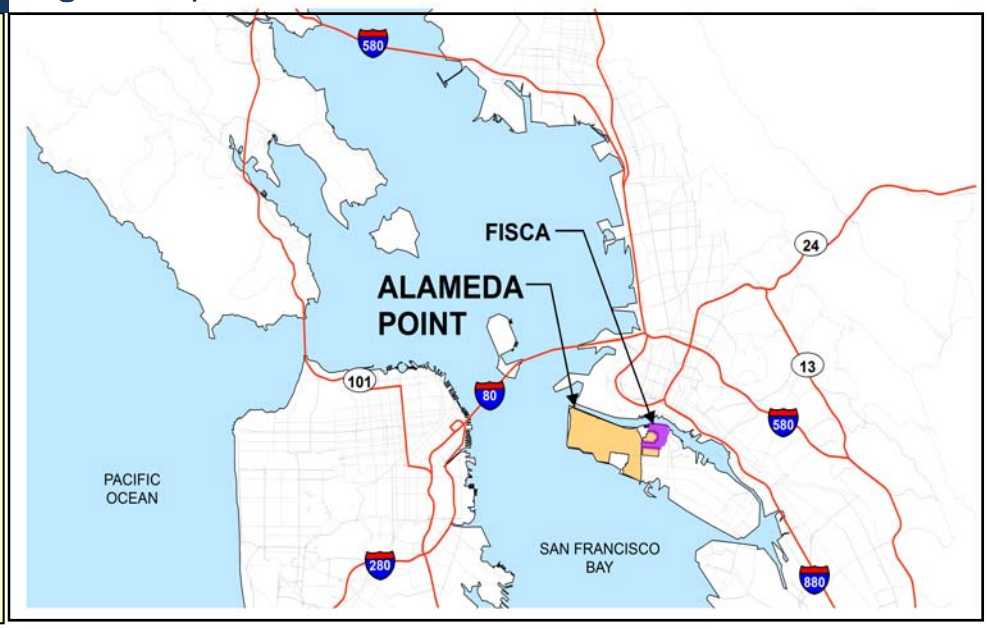
Regional Map



FLEET AND INDUSTRIAL SUPPLY CENTER ANNEX

FISCA covers approximately 143 acres east of Alameda Point. Before 1920, FISCA and surrounding areas were undeveloped marshlands and tidal flats along the San Francisco Bay. The area was used as a commercial airport from 1920 to 1941; the United States Government purchased the land in 1941, and the United States Army used the property as a supply depot. The Navy obtained the southern portion of the area in 1946 and the northern portion in 1966. The property was used as a main supply center supporting the operation of military fleets and shore activities in the Pacific Basin. In 1996, FISCA was designated for closure under the Base Realignment and Closure Act of 1990. FISCA was formally closed in September 1998. FISCA is not on the NPL, but eight *Installation Restoration* (IR) Sites, the *Marsh Crust*, and shallow *groundwater* at FISCA IR Site 02 were identified as potentially contaminated. Seven of eight IR sites have been determined to require "No Further Action". This Fact Sheet includes information about the *Marsh Crust* and IR Site 02.

The *Marsh Crust* is a layer of sediment contaminated with semi-volatile organic compounds that were deposited beneath FISCA and the eastern portion of Alameda Point from the late 1800s until the 1920s. *Records of Decision* (RODs) were issued in 2001 for the *Marsh Crust*, and contaminated soil at FISCA IR Site 02. A Five-Year review of the *Marsh Crust* and IR Site 02 soil in FISCA was prepared in 2006.

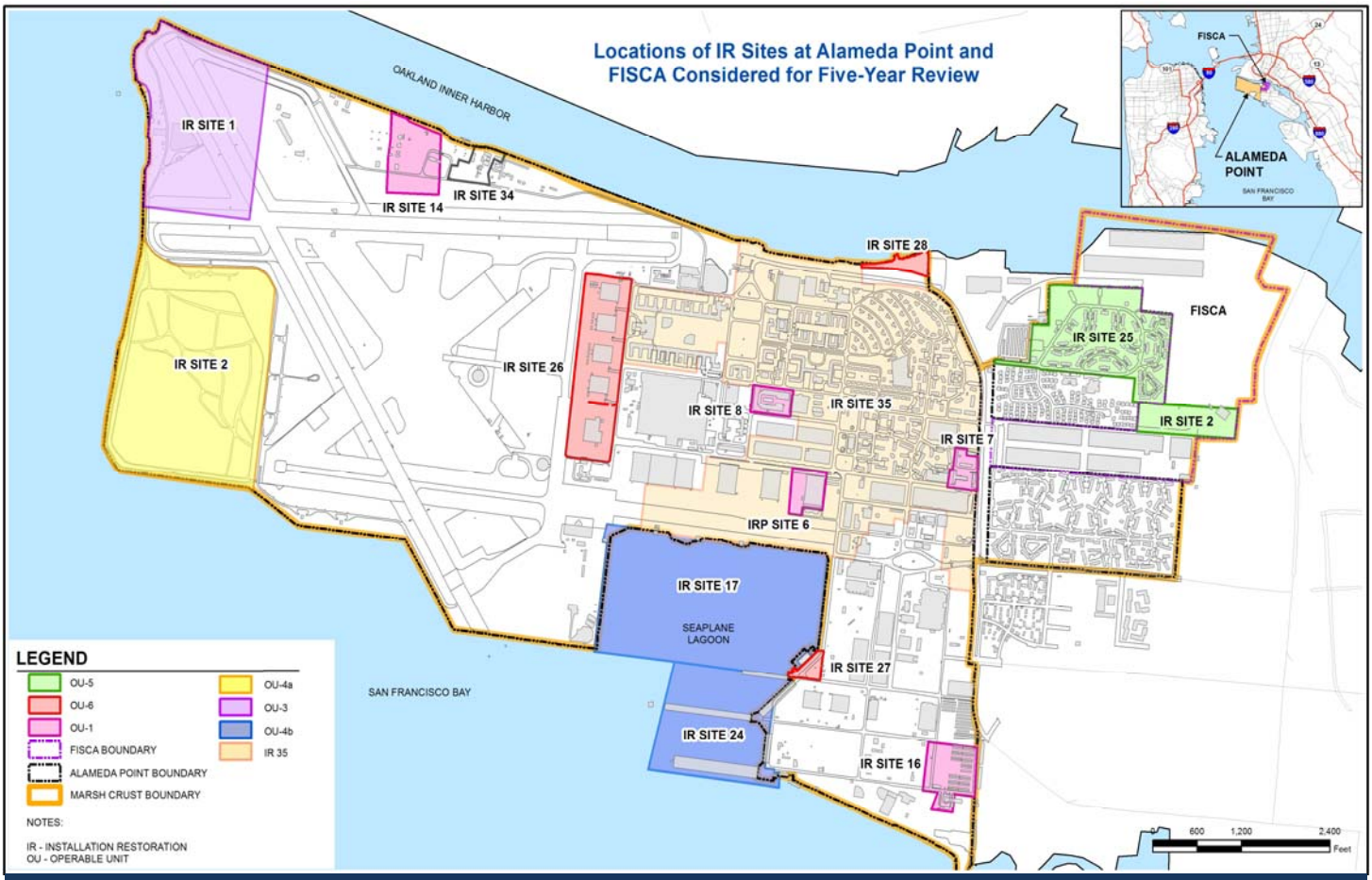
SUMMARY OF ALAMEDA POINT AND FISCA SITES IN FIVE-YEAR REVIEW

Operable Unit (OU) / Site ID		Contaminants of Concern
Alameda Point		
OU-1	IR Site 6	***Groundwater*:** tetrachloroethene (PCE), trichloroethene (TCE), dichloroethene (DCE), vinyl chloride (VC), dichlorobenzene (DCB).
	IR Site 7	**Soil:** arsenic, cadmium, lead, antimony, chromium, copper, molybdenum, nickel, vanadium, benzo(a)pyrene. ***Groundwater*:** total petroleum hydrocarbons (TPHs) being remediated under the Alameda Point Petroleum program.
	IR Site 8	**Soil:** lead, dieldrin, total polychlorinated biphenyl (PCBs). ***Groundwater*:** TPH being remediated under the Alameda Point Petroleum program.
	IR Site 14	***Groundwater*:** VC.
	IR Site 16	**Soil:** lead, chlordane, dieldrin, heptachlor, heptachlor epoxide. ***Groundwater*:** 1,2-DCB, 1,3-DCB, 1,4-DCB, PCE, TCE, cis-1,2,-DCE, VC, chlorobenzene, chlordane.
OU-3	IR Site 1	**Soil:** PAHs, pesticides, PCBs, metals, radioactive isotopes (RAD) ***Groundwater:*** VC. **Surface Water:** volatile organic compounds **(**VOCs), semi-volatile organic compounds (SVOCs), arsenic.
OU-4a	IR Site 2	**Soil:** benzo(a)pyrene, PCBs, metals, pesticides, RAD. **Surface Water:** metals, pesticides, PCBs, SVOCs, PAHs.
OU-4b	IR Site 17	**Sediments:** total PCBs, DDx*, cadmium, lead, and chromium.
	IR Site 24	**Sediments:** PCBs, pesticides and metals
OU-5	OU-5 / FISCA IR Site 02 *Groundwater*	***Groundwater*:** benzene and naphthalene.
	IR Site 25	**Soil:** benzo(a)pyrene.
OU-6	IR Site 26	***Groundwater*:** TCE, cis-1,2-DCE, VC.
	IR Site 27	***Groundwater*:** PCE, TCE, 1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, VC.
	IR Site 28	**Soil:** arsenic, copper, lead, polycyclic aromatic hydrocarbons (PAHs). ***Groundwater*:** copper.
No OU	IR Site 34	**Soil:** VOCs, PAHs, PCBs, pesticides, TPH, metals.
No OU	IR Site 35	**Soil:** heptachlor, lead, and TPH.
FISCA		
OU-2	IR Site 02 Soil	**Soil:** cadmium and PCBs.
FISCA & Alameda Point		
No OU	*Marsh Crust*	**Soil:** PAHs.

* the sum of 4,4'-dichlorodiphenyldichloroethane (DDD), 4,4'-dichlorodiphenyldichloroethene (DDE), and 4,4'-dichlorodiphenyltrichloroethane (DDT)

Although RODs have been signed for IR Sites 1, 2, 17, 24, 34, and 35, these sites do not have remedies in place to review, and their remedy performance was not evaluated as part of this Five-Year Review. They are, however, included in the remedial action summary table below and will be evaluated in future Five-Year Reviews.

The locations of each OU and associated IR sites are shown in the map below. The sites are in various stages of the CERCLA process, ranging from Remedial InvestigationAction to long-term monitoring.



FIVE-YEAR REVIEW PROCESS

WHAT IS A "FIVE-YEAR REVIEW"?

CERCLA requires a periodic review of cleanup remedies that leave hazardous substances remaining on site above levels which permit unrestricted use and unlimited exposure. Five-year reviews provide an opportunity to evaluate the implementation and performance of a remedy to determine whether it remains protective of human health and the environment. This periodic review, referred to as a "statutory five-year review", generally begins five years following the initiation of a cleanup action, and is repeated every succeeding five years so long as future uses remain restricted.The trigger action date for the sites discussed in this fact sheet is based on the first Five-Year Review, which was conducted in 2006.

The Navy issued a policy in 2001, updated in both 2004 and 2011, addressing five-year reviews on Navy and Marine Corps facilities. This five-year review conducted for the Alameda sites follows CERCLA, the Department of Navy policy, and USEPA guidance.

How is a Five-Year Review Performed?

There are four steps in a five-year review:

Document Review - Key documents are gathered and analyzed.

Site Inspection - The sites are inspected. Controls put in place as part of the remedies, such as fencing, signs, and soil covers are checked to determine their presence and integrity.

Site Interviews - Interviews with site managers, site personnel, Restoration Advisory Board members, and other community members are conducted to help identify problems or concerns with the remedies that need to be addressed.

Protectiveness Statement - Information gathered during the first three steps is used to answer the question of whether a remedy is protective of human health and the environment for each individual site.

The table below is a summary of the remedial actions for the IR sites at Alameda Point and FISCA. If you are interested in reading about the specific remedies chosen for each site mentioned in this fact sheet, the document known as the *Record of Decision* (ROD) for each site can be found at the Navy's *administrative record and information repository* locations. *Administrative record and information repository* locations are provided at the end of this fact sheet.

REMEDIAL ACTION SUMMARY

Operable Unit (OU) / IR Site		Remedy Description
Alameda Point		
OU-1	IR Site 6	**Soil:** Sampling and excavation with offsite disposal ***Groundwater:*** *In situ chemical oxidation* (ISCO) and *accelerated bioremediation, monitored natural attenuation* (MNA), and Short-Term *Institutional Controls* (ICs)
	IR Site 7	**Soil:** Sampling and excavation with offsite disposal, ICs ***Groundwater:*** Remediated under the Alameda Point Petroleum program
	IR Site 8	**Soil:** Sampling and excavation with offsite disposal, ICs ***Groundwater:*** Remediated under the Alameda Point Petroleum program
	IR Site 14	***Groundwater:*** ISCO, follow-up monitoring, ICs
	IR Site 16	**Soil:** Sampling and excavation with offsite disposal ***Groundwater:*** ISCO, *accelerated bioremediation*, MNA, and Short-Term ICs
OU-3	IR Site 1	**Soil:** Excavation, offsite disposal, soil cover, radiological screening and explosive hazard sweep, wetlands mitigation and institutional controls. ***Groundwater/Surface Water:*** ISCO, MNA, groundwater monitoring and ICs Remedial Design is underway.
OU-4a	IR Site 2	**Soil:** Soil cover and institutional controls ***Surface Water:*** MNA Remedial action is underway as of March 2011.
OU-4b	IR Site 17	**Sediments:** Sampling, dredging, dewatering and offsite disposal Remedial action is underway as of January 2011.
	IR Site 24	**Sediments:** Dredging and offsite disposal Remedial Design is underway.
OU-5	OU-5 / FISCA IR Site 02 *Groundwater*	***Groundwater:*** *Biosparging*, Soil Vapor Extraction, Nutrient / Microorganisms Enhancement, MNA, and ICs
	IR Site 25	**Soil:** ICs
OU-6	IR Site 26	***Groundwater:*** ISCO, *in situ bioremediation*, Short-Term ICs
	IR Site 27	***Groundwater:*** ISCO, MNA, ICs
	IR Site 28	***Groundwater:*** Addition of *Metals Immobilization Compound* into saturated soil and follow-up monitoring **Soil:** Sampling and excavation with offsite disposal, ICs
No OU	IR Site 34	**Soil:** Excavation and offsite disposal Remedial Design is underway.
No OU	IR Site 35	**Soil:** Excavation and offsite disposal Remedial Action was initiated May 2011 and was completed June 2011, completion reporting pending.
FISCA		
OU-2	IR Site 02 Soil	**Soil:** Excavation of shallow soil with offsite disposal, ICs
FISCA & Alameda Point		
No OU	*Marsh Crust*	**Soil:** ICs

Groundwater Treatment System in the OU-5

Photo Taken 10/12/2010

ARE THE REMEDIES WORKING AND EFFECTIVE?

The USEPA recommends the use of the following three questions to provide the framework for organizing and evaluating site data and information, and to ensure that relevant issues are considered when assessing the protectiveness of a remedy:

- **Question A**— Is the remedy functioning as intended by the decision documents?
- **Question B**— Are the exposure assumptions, toxicity data, cleanup levels, and remedial action (RA) objectives used at the time of the remedy selection still valid?
- **Question C**— Has any other information come to light that could call into question the protectiveness of the remedy?

The answers to these questions were then used to evaluate the overall protectiveness for each site.

Site ID	Technical Assessment			Conclusion / Protectiveness Statement
	Question A	Question B	Question C	
IR Site 6	YES	YES	NO	The RAs performed at IR Site 6 are categorized as protective of human health and the environment as intended by the decision document.
IR Site 7	YES	YES	NO	The RAs performed at IR Site 7 are categorized as protective of human health and the environment as intended by the decision document.
IR Site 8	YES	YES	NO	The RAs performed at IR Site 8 are categorized as protective of human health and the environment as intended by the decision document.
IR Site 14	YES	YES	NO	The RAs performed at IR Site 14 are categorized as protective of human health and the environment as intended by the decision document.
IR Site 16	YES	YES	NO	The RAs performed at IR Site 16 are categorized as protective of human health and the environment as intended by the decision document.
IR Site 25	YES	YES	NO	The RAs performed at IR Site 25 is categorized as protective of human health and the environment as intended by the decision document.
IR Site 26	YES	YES	NO	The RAs performed at IR Site 26 are categorized as protective of human health and the environment as intended by the decision document.
IR Site 27	YES	YES	NO	The RAs performed at IR Site 27 are categorized as protective of human health and the environment as intended by the decision document.
IR Site 28	YES	YES	NO	The RAs performed at IR Site 28 is categorized as protective of human health and the environment as intended by the decision document.
OU-5 / FISCA IR Site 02 *Groundwater*	YES	YES	NO	The RAs performed at OU-5 / FISCA IR Site 02 *Groundwater* is categorized as protective of human health and the environment as intended by the decision document.
IR Site 02 Soil	YES	YES	NO	The RAs performed at IR Site 02 for soil is categorized as protective of human health and the environment as intended by the decision document.
Marsh Crust	YES	YES	NO	The RAs performed at *Marsh Crust* and former subtidal area is categorized as protective of human health and the environment as intended by the decision document.

WHAT'S NEXT

The 2011 Five-Year Review identified the following issues:

Alameda Point IR Sites 7, 8, 25, and 28: The Office of Environmental Health Hazard Assessment (OEHHA) has revised the human exposure to lead benchmark to 80 parts per million for residential land use; this new benchmark is lower than the previous benchmark on which the remedy decisions were based. The DTSC, however, officially adopted the new lead benchmark in June 2011, which was after the cutoff date (April 30, 2011) for new information to be included in this Five-Year Review.

Alameda Point IR Sites 6, 7, 8, 16, 28, and OU-5/FISCA IR 02 Groundwater: At the time of this Five-Year Review, post-remedy implementation monitoring data for these Sites had not been validated; therefore the data are not available for review and inclusion in this report to assess the effectiveness of the remedy.

Alameda Point IR Site 7: Updates to the cadmium toxicity criteria are pending. Changes in the toxicity criteria may have implications to the human health risk assessment for IR Site 7.

Alameda Point IR Site 14: Rebound of vinyl chloride in groundwater is a possible indicator that MNA may not meet the remedial goal within the Navy's expected time frame of three years.

Alameda Point IR Site 26:

- After several ISCO applications, trichloroethene (TCE), dichloroethene (DCE), and vinyl chloride (VC) all continued to exceed the remedial goals as specified in the ROD. Transition to in-situ bioremediation began October 1, 2010. Given that *in situ bioremediation* was implemented within the past year, not enough monitoring data are available to assess its effectiveness.
- The unexpected formation of disinfectant byproducts (such as trihalomethanes (THM)) was noted during post-ISCO monitoring; however, the data indicate that levels appear to be decreasing and that the THMs and their reductive daughter products such as methylene chloride or chloromethane do not appear to be migrating from the Site.

Alameda Point IR Site 27: There is potential for rebound of chemicals of concern in *groundwater* because of insufficient residual ISCO compounds (sodium persulfate) in *groundwater*.

Alameda Point IR Site 28: There is a potential for rebound of copper in *groundwater*.

FISCA IR 02 Soil: Updates to the cadmium toxicity criteria are pending. Changes in the toxicity criteria may have implications to the human health risk assessment FISCA IR 02 Soil.

The Navy is the responsible party and lead agency for the issues detailed above. The Navy will address these issues in the short term using site-specific documents (e.g., Interim Remedial Action Completion Reports, Risk Assessments, the Annual Basewide *Groundwater* Monitoring Report) and in the long term with the Five-Year Review in 2016.

The following are the recommendations/follow-up actions for the applicable IR Sites:

Alameda Point IR Sites 7, 8, 25, and 28: Navy to evaluate whether OEHHA's revised lead benchmark for residential land use would impact protectiveness of the remedies for these sites. The Navy's evaluation of the OEHHA's revised residential land use benchmark will be completed by 2015.

Alameda Point IR Sites 6, 7, 8, 16, 28, and OU-5/FISCA IR 02 *Groundwater*: Navy to continue tracking the progress of the remedies at these sites per the approved RODs and review and evaluate finalized post-remedy data to assess effectiveness of the remedies. The review and evaluation of the post-remedy data will be completed by 2014.

Alameda Point IR Site 7: Navy to track the potential updates to the cadmium toxicity criteria, and evaluate potential impacts to the human health risk assessment when these updates have become final.

Alameda Point IR Site 14: Navy to continue monitoring and evaluating vinyl chloride concentrations to ensure that the cleanup goal will be met within the Navy's expected time frame of three years (2014).

Alameda Point IR Site 26:

- Navy to continue monitoring the TCE, DCE, and vinyl chloride concentrations in *groundwater* to ensure that the ISB is effective at reducing these chemicals to levels below the remediation goals within the expected time frame of three years (2014).
- Navy to continue monitoring disinfectant byproduct concentrations in *groundwater* to ensure that concentrations continue to decrease over time and return to pre-ISCO concentrations by 2015.

Alameda Point IR Site 27: Navy to continue monitoring and evaluating vinyl chloride concentrations at IR Site 27 under the basewide *groundwater* monitoring program to ensure that contaminant concentrations continue to decrease and are below remedial goals within the Navy's expected time frame of three years (2014).

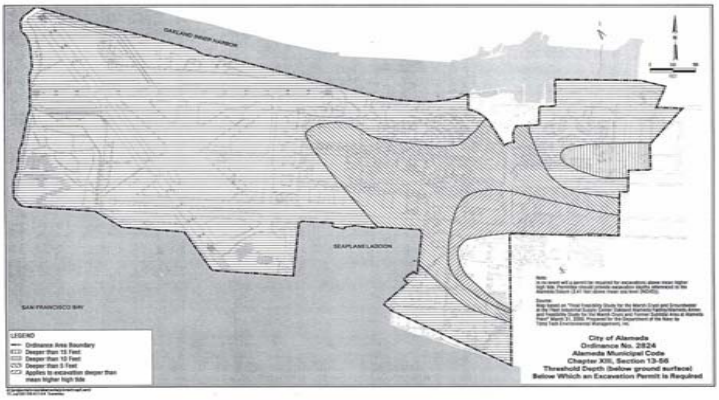
Alameda Point IR Site 28: Navy to continue monitoring and evaluating copper concentrations at IR Site 28 per the approved work plan for the next 10 years (until 2021) to ensure that concentrations in *groundwater* are/remain below the trigger level for copper.

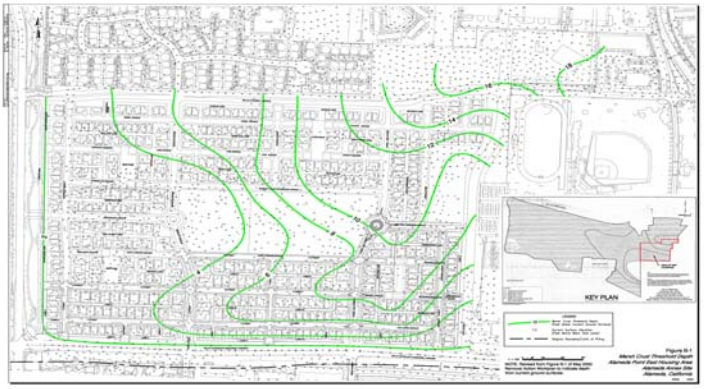
FISCA IR Site 02: Navy to continue to track the potential updates to the cadmium toxicity criteria, and to evaluate potential impacts to the human health risk assessment when these updates have become final.

Injection and Extraction Wells in the IR Site 14 Remediation Area
Photo Taken 10/12/2010

WHAT'S NEXT (continued)

Marsh Crust: The City of Alameda has enacted City of Alameda Ordinance No. 2824 passed on February 15, 2000 that prohibits engaging in any excavation below specified depths on former Navy property without an excavation permit and without taking proper measures to ensure that workers are not unduly exposed and that all contaminated material brought to the surface is disposed of properly. The City of Alameda directly implements and enforces Ordinance No. 2824. To help with implementation of the ordinance, the City of Alameda has established a threshold depth, below which a permit is required for excavation. The City of Alameda has published a map that depicts the parcels and threshold depths for which a permit is required. The map can be viewed at the City of Alameda Permitting Department office. Additionally, the City of Alameda's website includes the *Marsh Crust* Ordinance; the Marsh Crust Ordinance Permit Application (with original map); and the updated threshold-depth map and memo. This website allows anyone to download these documents from the following link: http://www.cityofalamedaca.gov/City-Hall/Marsh-Crust. The *Marsh Crust* maps are shown below.





GLOSSARY AND ACRONYMS

Administrative Record – A collection of all response action documents at a Navy installation that justify why particular response actions were selected. It is maintained by the Navy and made available for public review at or near a site.

Accelerated Bioremediation – The use of enhanced microorganism metabolism to remove pollutants.

Biosparging – An in situ remediation technology where oxygen and nutrients are injected into the saturated zone. This causes an increase in the biological activity of indigenous microorganisms which can biodegrade organic constituents.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) – Commonly referred to as Superfund, authorizes federal action to respond to the release, or threat of release, into the environment of hazardous substances, pollutants, or contaminants that may present an imminent or substantial danger to public health or welfare.

Groundwater – Water beneath the ground surface that fills spaces between soil particles. Groundwater at Alameda Point is not potable because of high naturally occurring mineral content.

Information Repository – The physical location where a collection of site information is maintained. It contains copies of documents available for public review.

Installation Restoration (IR) Site – Areas designated under the Navy's program to identify, investigate, assess, characterize clean up, or control past releases of hazardous substances.

Institutional Control (IC) – A legal or administrative device to maintain the viability and effectiveness of the selected remedy, and that limits access to or use of property (for example, land use restrictions imposed by the property owner contained in a property deed).

In situ Bioremediation (ISB) – The use of biological agents, such as bacteria, fungi, or green plants, to remove or neutralize contaminants, as in polluted soil or water.

In situ Chemical Oxidation (ISCO) – An in situ remediation technology where an oxidizing agent is put into the ground which chemically converts hazardous contaminants to non-hazardous or less toxic compounds. The oxidizing agents most commonly used are ozone, hydrogen peroxide, hypochlorites, chlorine, and chlorine dioxide.

Marsh Crust – The Marsh Crust is a layer of sediment contaminated with semi-volatile organic compounds that were deposited across FISCA and the eastern portion of Alameda Point from the late 1800s until the 1920s. The Marsh Crust also extends into Alameda Point.

Metals Immobilization Compound – This compound causes metals in groundwater to adsorb to soil particles or precipitate. Both of these mechanisms can permanently remove metals from the aqueous phase, restoring the aquifer and the desired usability of the water. This prevents continued migration of contaminated metals plumes.

Monitored Natural Attenuation (MNA) – A passive remedial action that observes contaminant levels over consecutive groundwater monitoring events to determine if they are degrading by natural processes.

Record of Decision (ROD) – A decision document under the CERCLA Remedial Program that documents how a site will be cleaned up and why the cleanup method was selected.

Acronyms

BCT – BRAC Cleanup Team
BRAC – Base Realignment and Closure
CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act
DCB – dichlorobenzene
DCE – dichloroethene
FISCA – Fleet and Industrial Supply Center Oakland, Alameda Facility/ Alameda Annex
IC – Institutional Control
IR – Installation Restoration
ISCO – In situ Chemical Oxidation
MNA – monitored natural attenuation
NPL – National Priority List
OU – Operable Unit
PAH – polycyclic aromatic hydrocarbon
PCB – polychlorinated biphenyl
PCE – tetrachloroethene
RA – remedial action
ROD – Record of Decision
TCE – trichloroethene
TPH – total petroleum hydrocarbon
USEPA – (U.S.) Environmental Protection Agency

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Inside: Information on a Five-Year Review at Alameda Point and Fleet and Industrial Supply Center, Alameda Facility

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INFORMATION REPOSITORY AND ADMINISTRATIVE RECORD

The Navy maintains two *information repositories* for Alameda Point and Alameda Facility/Alameda Annex. The repositories contain project documents and other reference materials related to the Navy's IR Program. The repositories are updated as new information becomes available.

ALAMEDA POINT

950 West Mall Square
2nd Floor, Rooms 240-241
Alameda, CA 94510
(415) 743-4713
Hours:
Monday - Friday
8:30 a.m. - 5:00 p.m.

ALAMEDA LIBRARY

1550 Oak Street
Alameda, CA 94510
(510) 747-7777
Hours:
Monday 12:00 p.m. - 8:00 p.m.
Tuesday - Thursday 10:00 a.m.- 8:00 p.m.
Friday - Saturday 10:00 a.m. - 5:00 p.m.
Sunday 1:00 p.m. - 5:00 p.m.

FOR MORE INFORMATION

The Navy welcomes your input. If you have questions or concerns, or would like more information, please contact:

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