



Proposed Plan for IR Site 27, Dock Zone Former NAS Alameda

BRAC PMO

Alameda, California

November 2006

U.S. NAVY ANNOUNCES PROPOSED PLAN

The U.S. Navy encourages the public to comment on its proposed plan for cleanup of *groundwater* at *Installation Restoration (IR)* Program Site 27*, the Dock Zone, at Alameda Point, the former Naval Air Station (NAS) Alameda in Alameda, California. The U.S. Environmental Protection Agency (EPA), *California EPA Department of Toxic Substances Control (DTSC)*, and *San Francisco Bay Regional Water Quality Control Board (Water Board)* worked with the Navy in the evaluation of all of the alternatives and in the selection of the preferred alternative.

This Proposed Plan presents the Navy's preferred remedial (cleanup) alternative for groundwater at IR Site 27. Although groundwater at IR Site 27 is designated as a potential drinking water source under both federal and state criteria, it is currently not used for domestic purposes or as a drinking water source. However, levels of certain contaminants (*volatile organic compounds*, or *VOCs*) in IR Site 27 groundwater are found at levels above applicable regulatory criteria. Evaluation of IR Site 27 soil shows that there is no threat to human health or the environment, and therefore no action is required for soil. The Navy proposes to clean up IR Site 27 groundwater by:

- **Treating groundwater** using *in situ chemical oxidation (ISCO)* to reduce contaminants to levels considered safe for human health and the environment.
- **Monitoring groundwater** for 3 years (including the ISCO treatment period) to confirm that treatment has reduced VOC levels and that the *remediation goals (RGs)* proposed in this plan and documented in the forthcoming *Record of Decision (ROD)* have been met.

This proposed plan summarizes the site history, environmental investigations, risk assessments, and remedial alternatives evaluation conducted at IR Site 27 and describes the basis for choosing the preferred alternatives. The Navy will consider public comments on this proposed plan during preparation of the ROD document for IR Site 27.

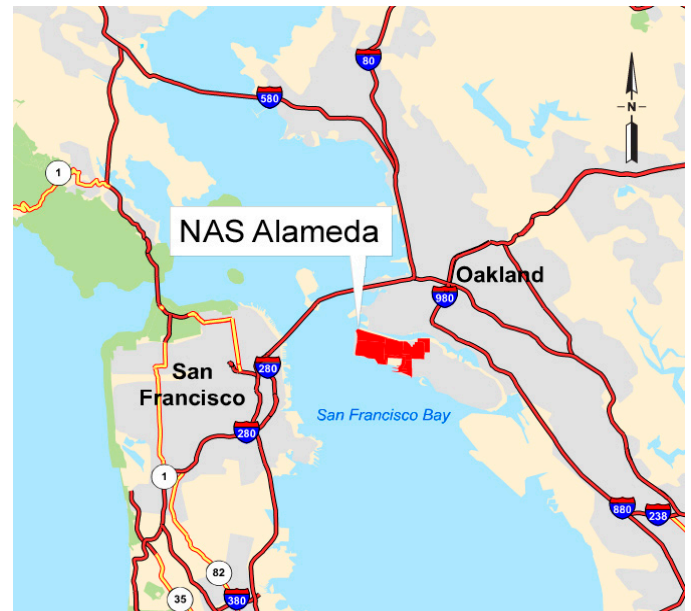


Figure 1. Alameda Point

- NOTICE - Public Comment Period

November 20, 2006 through
December 22, 2006

Public Meeting
December 12, 2006
Alameda Point
Main Office Building, Room 201
950 West Mall Square
Alameda, California
6:30 to 8:00 p.m.

*A glossary of terms and definitions is provided on page 14. Words included in the glossary appear in *italized font* the first time they are used in the text.

THE CERCLA PROCESS

The Navy is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the *Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)* commonly known as “Superfund”; and Section 300.430(f)(2) of the *National Oil and Hazardous Substances Pollution Contingency Plan (NCP)* which is the federal regulation that guides CERCLA. The flow chart to the right illustrates the current status of IR Site 27 in the CERCLA process.

The Proposed Plan summarizes information detailed in the *remedial investigation (RI)* and *feasibility study (FS)* reports and other supporting documents contained in the administrative record file for IR Site 27. The Navy encourages the public to review these documents to gain an understanding of the environmental investigation, risk assessment, and remedial alternative evaluation activities that have been conducted. The documents are available for public review at the location listed on Page 12.

SITE DESCRIPTION AND BACKGROUND

Former NAS Alameda, now called Alameda Point, ceased naval operations in 1997. Alameda Point is located on the western tip of Alameda Island, which is on the eastern side of San Francisco Bay (see Figure 1). IR Site 27 is located in the south-eastern portion of Alameda Point (see Figure 2) and is approximately 15.8 acres in size. It is bounded on the west by Seaplane Lagoon and on the east by Viking Street. The southern site boundary parallels and is approximately 160 feet south of West Oriskany Street, at the northern edge of Buildings 166 and 167. The northern site boundary is roughly parallel to and approximately 50 feet north of Building 168.

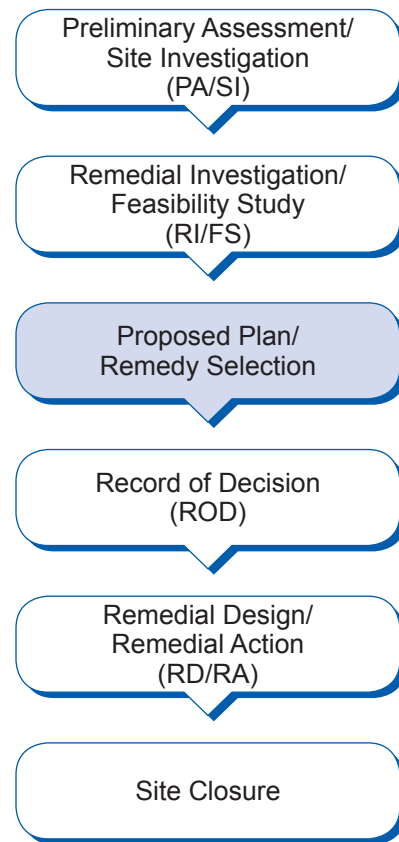
IR Site 27 was historically used for ship docking, repair, and painting; equipment and materials staging and storage; vehicle wash-down; and chemical storage and handling in Building 168. Current operations by tenants leasing space at IR Site 27 are generally similar to historical operations.

A sheetpile bulkhead, installed as part of the construction of Seaplane Lagoon and the hydraulic filling of the area that is now IR Site 27, exists beneath the site along Ferry Point Road (see Figure 3). This bulkhead separates “inland” groundwater and “shoreline” groundwater. The

groundwater sampled and analyzed from wells in these two areas exhibit different characteristics, such as levels of total dissolved solids.

Groundwater at IR Site 27 is designated as a potential drinking water source; however, it is not presently used as a drinking water source. This will be discussed further in this Proposed Plan.

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



 Current Phase

The City of Alameda General Plan Amendment has designated IR Site 27 as future marina and inner harbor areas that may include marina, civic, residential, recreational, light industrial, retail, and commercial uses.

Sources of the chemicals of concern documented in groundwater at IR Site 27 include past operations conducted within the site.

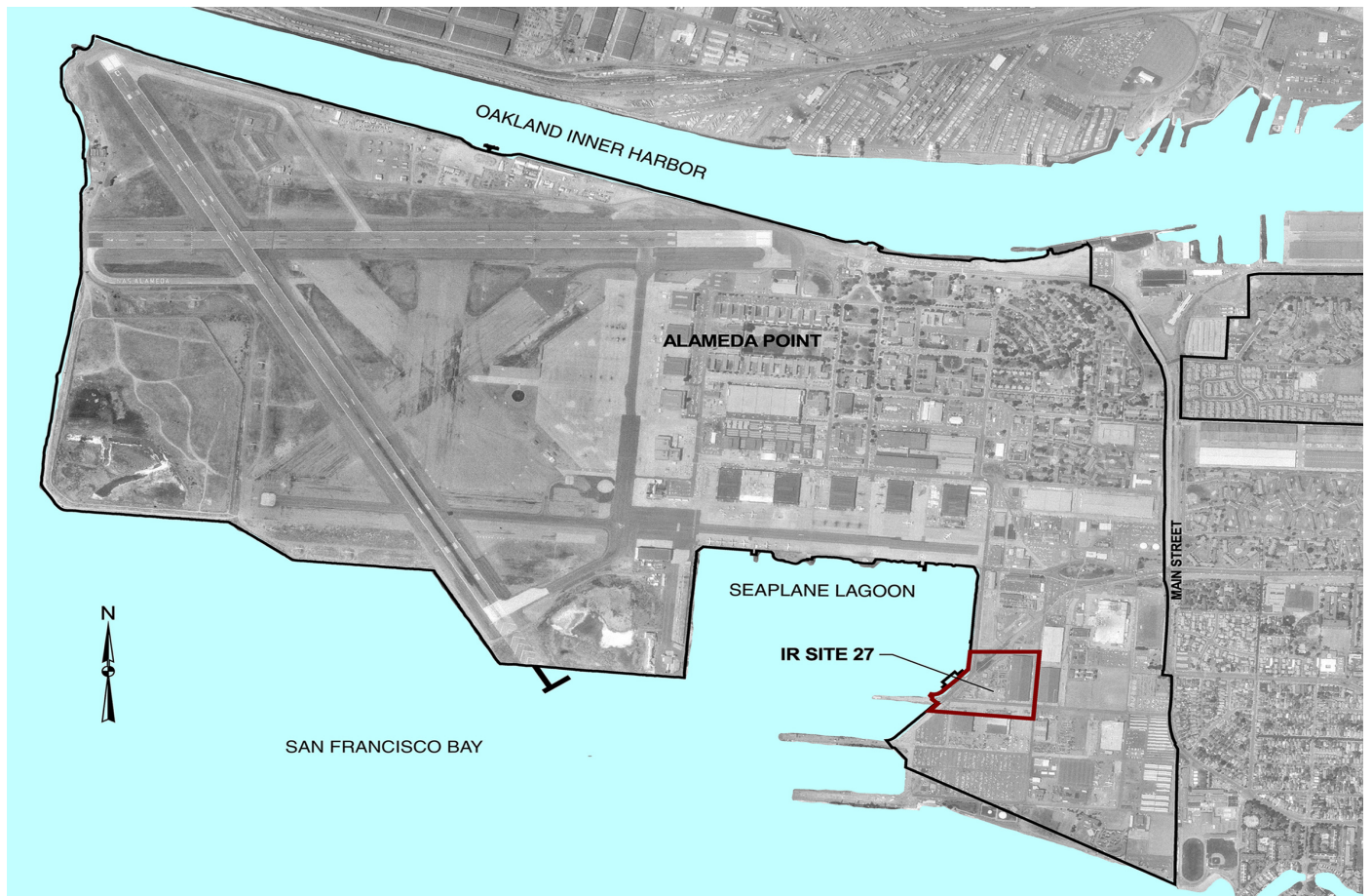


Figure 2. IR Site 27

PREVIOUS SITE INVESTIGATIONS

Numerous investigations of soil and groundwater have been conducted at IR Site 27 and are summarized below. The RI and FS Reports, as well as other documents containing information on the environmental investigations conducted at IR Site 27 are available for public review at the location listed on Page 12.

Initial Assessment Study (1983)

- identified fuel lines crossing the site

Resource Conservation and Recovery Act (RCRA) Facility Assessment (1992)

- identified seven fuel-containing underground storage tanks (USTs)

UST removals and investigations (1994-2000)

- tested soil and groundwater for potential UST spills and leaks
- revealed low levels of petroleum hydrocarbons and chlorinated solvents in the groundwater

Environmental baseline surveys (1993-2003)

- investigated the condition of property in preparation for future transfer and reuse of parcels

Fuel pipeline removal (1998-1999)

- sampled soil and groundwater to document possible concentrations of total petroleum hydrocarbons (TPH) remaining following pipeline removal
- results indicated the continued presence of TPH and/or benzene, toluene, ethylbenzene, and xylene constituents in soil and groundwater
- incorporated the former fuel line area into the Alameda Point TPH Corrective Action Program activities at Corrective Action Area (CAA)-11B (northwestern portion of IR Site 27 is within CAA-11B boundaries)

Storm sewer study (2000)

- assessed storm sewers as potential transport pathways for chemicals to reach San Francisco Bay surface water and sediment

Data gap investigation (2001)

- sampled soil and groundwater to fill in gaps in data collected during previous investigations

Remedial Investigation (2002-2005)

- installed groundwater monitoring wells
- sampled groundwater for VOCs, dissolved

- gases, and fuels
- sampled soil for metals and *polynuclear aromatic hydrocarbons (PAHs)*
- sampled soil gas for VOCs

Ongoing basewide investigations (2004-present)

- conducting parcel-specific soil investigations
- monitoring basewide groundwater on a quarterly basis
- permitting RCRA hazardous waste units
- investigating nearby IR sites and operable units relative to conditions at IR Site 27
- addressing several areas near IR Site 27 under the Alameda Point TPH Program (corrective action and monitoring as required for petroleum sites)

Feasibility Study Report (2005-2006)

- developed and evaluated remedial action alternatives to address human-health risks from VOCs in groundwater

SUMMARY OF REMEDIAL INVESTIGATION FINDINGS

Since 1983, the Navy has conducted a series of environmental investigations at Alameda Point, including IR Site 27. The results from analysis of samples collected during these previous investigations were reviewed during the RI to characterize the nature and extent of contamination at IR Site 27. Chemicals of interest in soil at the site include VOCs, PAHs, and metals. VOCs in soil are distributed at a few locations scattered across the site and are reported generally at low concentrations. PAHs in soil are limited in both distribution and frequency of occurrence. Maximum concentrations of PAHs in soil are well below the Alameda Point screening level (called the benzo(a)pyrene equivalent concentration) for PAHs.

Arsenic concentrations (a metal) in soil at the site are comparable to the Alameda Point background concentrations. Only two metals reported in soil exceed both Alameda Point background range and regulatory criteria: iron and thallium. However, since soil samples with elevated concentrations of these two metals are distributed at a few locations scattered across the site, there does not appear to be a significant release of these metals to soil at IR Site 27. The analytical results reported for the soil samples indicate that chemicals in soil are not a concern at IR Site 27 because the concentrations present do not pose a risk. Therefore, the RI Report recommended no action for soil at the site.

Chemicals of interest in groundwater at IR Site 27 include VOCs, PAHs, and arsenic. Chlorinated VOCs are present in groundwater in the central portion of IR Site 27 (see Figure 3). The RI Report recommended that an FS be prepared to identify and evaluate remedial alternatives to address the chlorinated VOCs in groundwater.

PAHs in groundwater are limited to three wells located along or near the shoreline with Seaplane Lagoon. No PAHs were reported at concentrations exceeding a *Maximum Contaminant Level (MCL)* and all PAHs that contribute to risk for ingestion of or dermal contact (while showering) with groundwater were reported only in one well each. Due to this limited distribution of PAHs (low concentrations and few samples in isolated wells) and locations limited to the area of brackish groundwater near Seaplane Lagoon, remediation of PAHs in groundwater is not necessary. In addition, concentrations of PAHs do not exceed criteria established for the protection of surface water.

Arsenic was the only metal reported in groundwater at concentrations both statistically different from Alameda Point background concentrations and exceeding the regulatory criteria. Arsenic concentrations that exceed background levels are limited to the central portion of the VOC plume near the railroad tracks and likely represent localized mobilization of arsenic present in soil at background levels. Upon completion of VOC remediation, localized geochemical conditions are expected to return to normal, and naturally occurring arsenic in soil will therefore be less likely to mobilize to groundwater. As a result, arsenic concentrations in groundwater are expected to be reduced.

Additional information on the nature and extent of contamination and chemicals of interest in soil and groundwater can be found in the RI Report, which is available for public review at the location listed on Page 12.

RISK ASSESSMENT PROCESS

In the context of environmental investigations and actions, “*risk*” can be defined as the likelihood or probability that a hazardous substance, when released to the environment, will cause adverse effects on exposed human or ecological receptors. Risk is further classified as carcinogenic (cancer-causing) or non-carcinogenic (causing other illnesses).

To determine whether contaminants at a site pose a risk requiring cleanup, a quantitative and qualitative risk assessment is performed, including a *human health risk assessment (HHRA)* and/or an *ecological risk assessment (ERA)*.

Different ways that receptors may be exposed to the chemicals of concern in groundwater and the potential future exposure frequency are identified (see Table 1). Based on specific quantitative analyses, risk probabilities and the likelihood of exposure are calculated. For the HHRA, risk calculations were based on conservative assumptions to protect human health. “Conservative” means the assumption will tend to overestimate risk, resulting in remediation goals that are more protective of human health.

Human health risk is classified as non-cancer (from exposure to non-carcinogens) or cancer (from exposure to carcinogens). A *hazard index (HI)* of 1 or less is considered to be an acceptable exposure level for non-cancer health hazards.

Cancer risk is generally expressed as a probability. For example, a cancer risk probability of 5 in 100,000 (5×10^{-5}) indicates that out of 100,000 people exposed using these risk assumptions, 5 cancer cases may occur as a result of exposure. To help characterize cancer risks, the federally established *risk management range* (10^{-4} to 10^{-6}) was used by risk managers to determine if risks are significant enough to warrant cleanup of the site.

According to the EPA, action is generally warranted for sites where the cumulative site risk for current and future land use is greater than 10^{-4} . When risk is within the risk management range (between 10^{-4} and 10^{-6}), site-specific factors are considered when making decisions about whether action is required. Action may be warranted if a chemical-specific standard that defines acceptable risk is exceeded, or if there are non-cancer effects or adverse environmental effects.

HUMAN HEALTH RISK ASSESSMENT (HHRA)

The HHRA that was presented in the IR Site 27 RI Report prepared in 2005 evaluated risk to receptors based on the planned future use of IR Site 27 as “mixed use,” including marina and inner harbor areas that will allow residential, recreational, commercial, and light industrial use. The HHRA concluded that IR Site 27 soil posed no threat to human health or the environment, but that

chlorinated VOCs in groundwater needed further evaluation.

For future use scenarios for construction workers and occupational workers, the cancer-risk and the noncancer hazard index results fell within the CERCLA and NCP risk management range. For hypothetical future residents, the cancer-risk values exceeded the CERCLA and NCP risk management range for two *exposure pathways* that assume domestic use of on-site groundwater: ingestion of groundwater and dermal contact with groundwater while showering. The chemicals driving risk in groundwater are arsenic, vinyl chloride (a VOC), and PAHs. Refer to Figure 3 which depicts the VOC plume.

Table 1. Exposure Pathways and Potential Receptors

- **Direct contact with shallow groundwater through dermal (skin) absorption.** Residents could contact groundwater while showering, for example, but only if groundwater is used for potable or domestic purposes, which is presently unlikely.
- **Ingestion (drinking) of groundwater.** Residents could ingest groundwater, but only if it is used for potable or domestic purposes, which is presently unlikely.
- **Inhalation (breathing) of contaminants from groundwater.** Residents could inhale groundwater while showering, for example, or from other household use, but only if groundwater is used for potable or domestic purposes, which is presently unlikely.
- **Inhalation (breathing) of vapors from shallow groundwater in air.** Residents could inhale vapors from groundwater while showering, for example, or from other household use, but only if groundwater is used for potable or domestic purposes, which is presently unlikely.

The main risk driver in soil is arsenic. However, the arsenic concentrations reported in soil at IR Site 27 are not statistically different from the background levels found at Alameda Point. Therefore, the RI report recommended no further action for arsenic in soil.

The RI Report concluded that only the human-health risk that would be associated with the domestic use of IR Site 27 groundwater, specifically

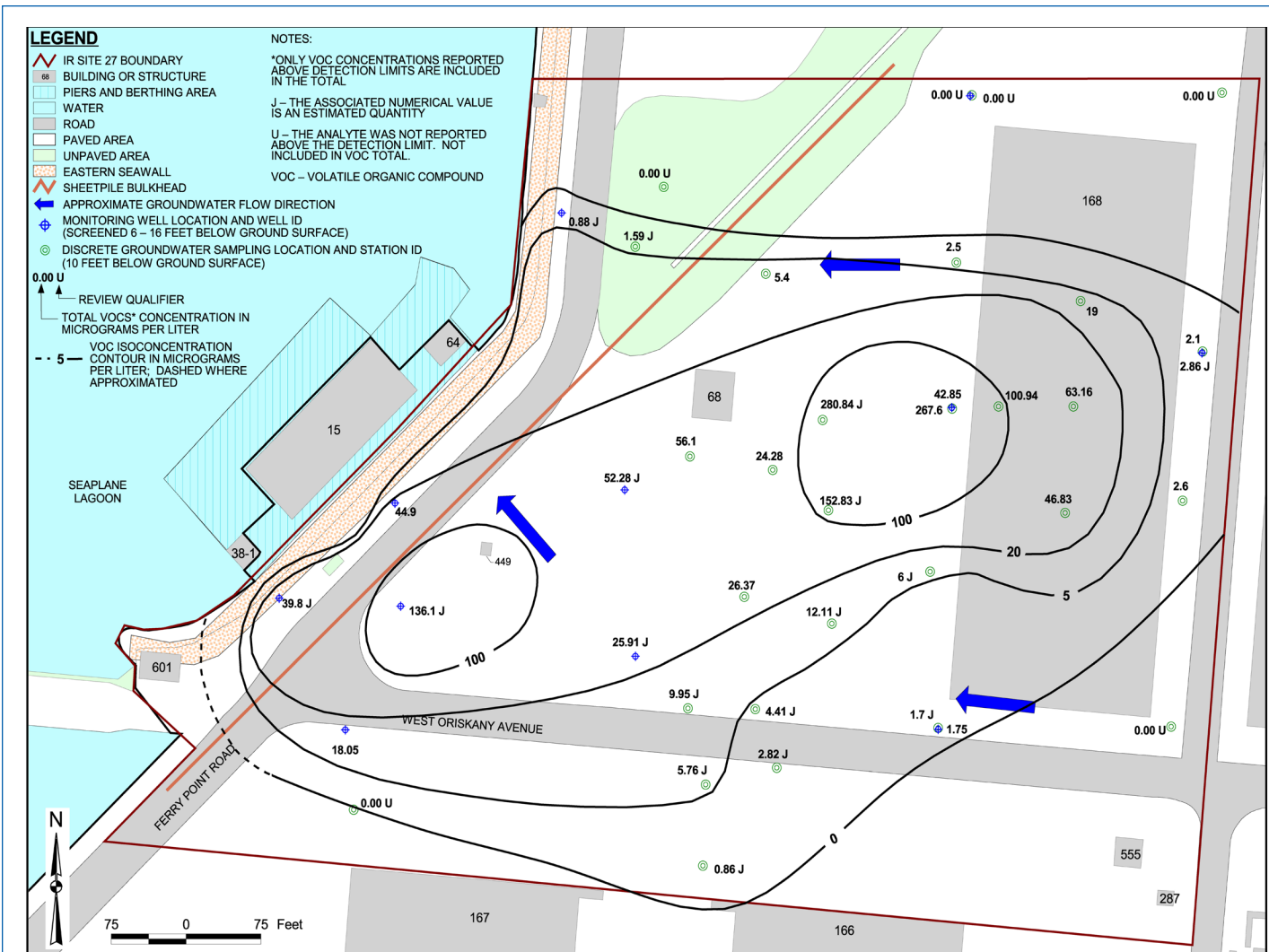


Figure 3. VOCs in groundwater

ingestion and dermal contact while showering, would exceed the risk management range established by CERCLA and the NCP.

ECOLOGICAL RISK ASSESSMENT (ERA)

The ERA presented in the IR Site 27 RI Report evaluated the risk to ecological receptors through direct soil contact and the food chain, as well as through groundwater releases to surface water.

The ERA results indicated negligible risk to terrestrial (ground-dwelling) wildlife receptors from chemicals in the soil and low risk to aquatic life from chemicals in groundwater, based on current conditions and planned future use of IR Site 27. The ERA provided a protective over-estimate of the actual risk of adverse ecological effects to aquatic life organisms in surface water adjacent to IR Site 27 because of the conservative nature of the assumptions used. Based on the ERA, the RI Report concluded that no further action at IR

Site 27 was warranted for terrestrial or aquatic remediation goals.

REMEDIAL ACTION OBJECTIVES (RAOs)

To evaluate alternatives for addressing remedies at a site, RAOs are developed during the FS phase to identify areas for potential remedial action, to screen the appropriate technologies, and to assess a remedial alternative’s ability to achieve remediation goals.

This Proposed Plan provides proposed remediation goals. Final remediation goals will be established in the ROD. The goals selected in the ROD will provide the basis for measuring the success of groundwater cleanup at IR Site 27.

The proposed groundwater RAOs have been selected to protect human health. The human-health risks at IR Site 27 are within the risk management range for current and likely future land-use scenarios. The Navy has proposed to reduce contaminant concentrations as a risk

management decision, in coordination with the regulatory agencies. The RAOs for IR Site 27, as presented in the FS Report, are as follows.

- Protect beneficial uses of groundwater underlying IR Site 27.
- Protect beneficial uses of surface water adjacent to IR Site 27.
- Protect human health by prohibiting domestic use of groundwater that has been impacted by chemicals of concern until the Navy, EPA, DTSC, and the Water Board concur that there is no longer an unacceptable risk from such exposure.

As discussed above, groundwater at IR Site 27 is designated as a potential drinking water source; however, it is not presently used as a drinking water source. Remediation goals for groundwater were developed based on drinking-water criteria and take into consideration potential domestic use of groundwater (see Table 2).

Shoreline groundwater was found not to pose a risk to ecological receptors. Concentrations of VOCs in shoreline groundwater have attenuated to concentrations that approach or meet drinking water standards and meet all surface water criteria.

Table 2. Remediation Goals for Groundwater at IR Site 27

Chemical of Concern	Remediation Goal (micrograms per liter)
1,1-dichloroethane	5 ^a
cis-1,2-dichloroethene	6 ^a
trans-1,2-dichloroethene	10 ^a
tetrachloroethene	5 ^b
trichloroethene	5 ^b
vinyl chloride	0.5 ^a
arsenic	10 ^c

Notes:

- a Remediation Goal (RG) based on California primary MCL
- b RG based on federal and California primary MCL of 5 micrograms per liter
- c RG based on federal primary MCL of 10 micrograms per liter

SUMMARY OF REMEDIAL ALTERNATIVES

Technologies and associated process options for IR Site 27 groundwater that were retained after screening in the FS were assembled into separate *remedial alternatives* for further evaluation. Ten remedial alternatives were developed and screened in the FS. Four of the ten remedial alternatives (Alternatives 2, 4B, 5, and 8) were eliminated from

detailed evaluation and will not be discussed further in this Proposed Plan. The retained alternatives include the following and are described in Table 3:

- Alternative 1 - No action
- Alternative 3 - *Monitored natural attenuation (MNA)* and *institutional controls (ICs)* for groundwater
- Alternative 4A - *In situ bioremediation (ISB)* source-area treatment, MNA, and ICs for groundwater
- Alternative 6A - *In situ chemical oxidation (ISCO)* source area treatment, MNA, and ICs for groundwater
- Alternative 6B - Full-scale ISCO treatment and groundwater confirmation sampling
- Alternative 7 - Dynamic circulation source-area treatment, MNA, and ICs for groundwater

Table 4 provides a description of institutional controls, which are part of alternatives 3, 4A, 6A, and 7.

APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)

CERCLA requires that remedial actions meet federal or state (if more stringent) environmental standards, requirements, criteria, or limitations that are determined to be *Applicable or Relevant and Appropriate Requirements (ARARs)*. Table 5 summarizes the significant potential ARARs that will be met by the preferred alternative for cleaning of groundwater at IR Site 27.

COMPARISON OF ALTERNATIVES

Selection of the preferred alternative is based on comparison against the nine NCP criteria, as presented in Figure 4.

The nine criteria include two threshold criteria, which must be met; five balancing criteria, which can be met in varying degrees; and two modifying criteria, reflecting agency and community acceptance. The last criterion is determined following the close of the public comment period. Table 6 compares the six remedial alternatives for IR Site 27 against the nine NCP criteria.

1. **Overall Protection of Human Health and the Environment.** All of the alternatives, except Alternative 1, are protective of human health and the environment by reducing the risks

Table 3. Remedial Alternatives for Groundwater – IR Site 27

Alternative	Description	Time to Reach Remediation Goals (years)	Total Cost (\$ Millions)
1. No Action	No action is required by CERCLA to be evaluated as an alternative to establish a baseline from which to compare the other alternatives. Under this scenario, no actions would be performed.	70	0
3. Monitored Natural Attenuation (MNA) and Institutional Controls (ICs) for Groundwater	MNA relies on naturally occurring processes to continue reducing contaminant levels in groundwater. A long-term groundwater monitoring program, including periodic reviews, would be implemented to track contaminant reduction. ICs would prohibit groundwater extraction and use at IR Site 27 as well as actions that would interfere with MNA activities.	70	2.75
4A. In situ Bioremediation (ISB) Source Area Treatment, MNA, and ICs for Groundwater	This alternative is similar to Alternative 3, but adds anaerobic ISB to accelerate VOC breakdown in IR Site 27 groundwater. A food-grade product would be added to accelerate <i>biodegradation</i> . ICs would be similar in scope to Alternative 3.	60	3.03
6A. In situ Chemical Oxidation (ISCO) Source Area Treatment, MNA, and ICs for Groundwater	This alternative is similar to Alternative 3 but adds ISCO in two treatment areas of the IR Site 27 groundwater plume to reduce VOC concentrations. ICs would be similar in scope to Alternative 3.	45	2.22
6B. Full-Scale ISCO Treatment and Groundwater Confirmation Sampling	This alternative is similar to Alternative 6A but would use ISCO to aggressively treat the IR Site 27 groundwater plume to reduce VOC concentrations to achieve remediation goals. The process would be used across the entire inland area of the 11-acre plume. If needed, a second treatment event would be included at up to one-half of the full-scale injection points. Groundwater sampling and analysis for MNA parameters is included as a part of this alternative over its expected duration. MNA parameters would be measured across the plume, including the shoreline portion, and may be employed where the groundwater concentrations approach the remediation goals. The remedial design will define the performance goals for ISCO and MNA.	3	2.08
7. Dynamic Circulation Source Area Treatment, MNA, and ICs for Groundwater	This alternative uses an innovative in-well source-area treatment technology to remove VOCs in two treatment areas. The combination of in-well <i>air sparging</i> , in-well <i>air stripping</i> , and <i>soil vapor extraction</i> circulates groundwater through a treatment system inside the well. MNA and ICs would be similar in scope to Alternative 3.	55	3.03

posed by the site through ICs. Alternative 1, which failed this first criterion, will not be compared further. The no-action alternative is a baseline for comparison and is required by the NCP.

2. **Compliance with ARARs.** Alternatives 3 through 7 comply with ARARs.

3. **Long-Term Effectiveness and Permanence.** All of the alternatives have some degree of long-term effectiveness and permanence; however, Alternatives 4A, 6A, and 6B would be the most effective and permanent remedies because they would result in permanent and long-term reductions in VOC concentrations.

Table 4. Institutional Controls

ICs described in this Proposed Plan include land use restrictions that would be established to limit human exposure to contaminated shallow groundwater until the risk-based remediation goals in the ROD and applicable or relevant and appropriate requirements (ARARs) have been met. ICs are a component of Alternatives 3, 4, 6A, and 7 and would be implemented as soon as feasible.

Long-term ICs are not a component of Alternatives 1 and 6B.

If the property within IR Site 27 is transferred to a non-federal entity, the land use restrictions will be incorporated into and implemented through two separate legal instruments:

- Restrictive covenants included in a “Covenant to Restrict Use of Property” entered into by the Navy and DTSC as provided in the substantive provisions of Cal. Code Regs. tit. 22 §67391.1 and consistent with the Navy and DTSC 2000 Memorandum of Agreement.
- Quitclaim Deed from the Navy to the property recipient.

Proposed Land Use Restrictions:

- Prohibit alteration, disturbance, or removal of Navy extraction, injection, and monitoring wells and associated piping and equipment; any component of a response or cleanup action; or associated utilities without the prior review and written approval of the Navy.
- Prohibit extraction of groundwater for domestic purposes.

Access provisions are required to ensure the Navy and the regulatory agencies have access to remedial equipment and other remedy components for the purpose of implementing the remedial action, performing maintenance activities, and conducting monitoring.

- 4. Reduction of Toxicity, Mobility, or Volume through Treatment.** Alternative 6B would be the best at achieving reduction of toxicity, mobility, or volume. Alternatives 4A, 6A, and 7 would meet this criterion. Alternative 3 would be the least effective in achieving this criterion because it relies on naturally occurring processes without additional treatment.
- 5. Short-Term Effectiveness.** Alternative 3 would be most effective in the short term; Alternatives 4A, 6A, and 6B are moderately effective in the short term; and Alternative 7 is the least effective in the short term because it would take longer to implement. Alternative 6B would reach the proposed remediation goals more quickly than the other alternatives considered.
- 6. Implementability.** All of the alternatives are implementable; however Alternatives 3, 4A, and 6A are most readily implementable, as the services and materials are readily and commercially available. Alternative 7 is more difficult because it uses an innovative source-area treatment technology that requires extensive invasive subsurface implementation, while 6B would be the hardest to implement

because of the large number of injection points required.

- 7. Cost.** Alternative 6B has the lowest overall cost, followed by Alternatives 6A and 3, while 4A and 7 have the same (highest) cost. The costs shown in Table 6 are total costs.
- 8. State Agency Acceptance.** The State of California, as a participant in the decision-making team, has reviewed the Proposed Plan and supports Alternative 6B.
- 9. Community Acceptance.** Community acceptance will be evaluated after the public comment period closes. A Responsiveness Summary in the ROD will document responses to public comments on this Proposed Plan.

PREFERRED ALTERNATIVE

The Navy, in coordination with the regulatory agencies, has made a risk management decision for IR Site 27 groundwater and prefers remedial **Alternative 6B**, in spite of its lower implementability, because it:

- protects human health and the environment;
- complies with ARARs;

Table 5. Applicable or Relevant and Appropriate Requirements

CERCLA requires that remedial actions meet federal or state (if more stringent) environmental standards, requirements, criteria, or limitations that are determined to be ARARs. Significant potential ARARs that will be met by the preferred remedy for cleanup of groundwater are listed below. See the FS report for more specific information on potential ARARs.

Potential Federal and State ARARs – Groundwater

The potential federal and state chemical-specific ARARs for IR Site 27 groundwater include the substantive provisions of the following potentially relevant and appropriate requirements:

- Federal MCLs (Maximum Contaminant Levels) for tetrachloroethene (PCE), trichloroethene (TCE), vinyl chloride, and arsenic in drinking water.
- Federal MCLGs (MCL Goals) for cis-1,2-dichloroethene (DCE) and trans-1,2-DCE.

Federal MCLs and MCLGs developed by the USEPA under the Safe Drinking Water Act (SDWA) (42 United States Code [USC], ch. 6A, § 300[f]-300[j]-26) are generally considered potentially relevant and appropriate requirements for aquifers with Class I and Class II characteristics, and therefore are potential federal ARARs. The point of contact for MCLs and MCLGs under the SDWA is at the tap. Therefore, the MCLs and MCLGs are not applicable ARARs for Navy sites. However, MCLs and MCLGs are generally considered relevant and appropriate as remediation goals for current or potential drinking water sources. The VOC-impacted groundwater at IR Site 27 exhibits Class II characteristics and, therefore, for FS purposes, MCLs and MCLGs are potential ARARs for groundwater.

- State primary MCLs for cis-1,2-DCE, trans-1,2-DCE, vinyl chloride, and 1,1-dichloroethane (DCA) (California Code of Regulations [Cal. Code Regs.] Title [tit.] 22 § 64444)

The state MCLs are potentially relevant and appropriate for groundwater because they are more stringent than federal MCLs.

- RCRA groundwater protection standards in Cal. Code Regs. tit. 22, § 66264.94(a)(1), (a)(3), (c), (d), and (e)
- Corrective action groundwater monitoring in Cal. Code Regs. tit 22 § 66264.100[d] and [g][1]

The San Francisco RWQCB identified the substantive provisions of the “Statement of Policy with Respect to Maintaining High Quality of Waters in California” (SWRCB Resolution 68-16) and “Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under California Water Code Section 13304” (SWRCB Resolution 92-49) as State ARARs for IR Site 27 groundwater remedial action. The SWRCB interprets Res. 68-16 as prohibiting further migration of the volatile organic contaminant plume at IR Site 27; however, EPA and the Navy do not agree that SWRCB Res. 68-16 applies to further migration. Further, the Navy’s position is that the SWRCB Res. 68-16 and 92-49 do not constitute chemical-specific ARARs (numerical values or methodologies that result in the establishment of a cleanup level at the site) since they are State requirements and are not more stringent than federal provisions of Cal. Code Regs. tit. 22 § 66424.94, determined to be ARARs for IR Site 27 groundwater remedial action. The Water Board and DTSC do not agree with the Navy’s determination that SWRCB Res. 92-49 and 68-16 are not ARARs for IR Site 27 remedial action; however, the Water Board and DTSC agree that the proposed remedial action would comply with SWRCB Res. 92-49 and 68-16.

Potential Federal and State ARARs – Surface Water

There are no natural streams, rivers, ponds, lakes, or other surface water bodies within the boundaries of IR Site 27. Sediments in Seaplane Lagoon (including the portion offshore of IR Site 27) are being investigated as part of IR Site 17. Shoreline groundwater is in contact with surface water, and groundwater generally flows toward Seaplane Lagoon. Therefore, surface-water requirements were identified to assist in developing cleanup goals for IR Site 27.

The substantive provisions of the following federal and state chemical-specific requirements were identified as potential ARARs for surface water:

- Water quality standards in the National Toxics Rule and California Toxics Rule standards at 40 Code of Federal Regulations (CFR) § 131.36 and § 131.38
- Basin Plan, Chapters 2 and 3 (Beneficial Uses and Water Quality Objectives)
- Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California, Sections 1.3 and 1.4

The Navy accepts the substantive provisions of §§ 13241, 13243, 13263(a), 13269, and 13360 of the Porter-Cologne Act enabling legislation, as implemented through the beneficial uses, water quality objectives, waste discharge requirements, and promulgated policies of the Basin Plan as ARARs.

Other Potential Federal and State ARARs

- The Migratory Bird Treaty Act of 1972 (16 USC § 703–712) is the only potential biological resource ARAR for the remedial actions at IR Site 27 because there is the potential for listed birds to land on the site.
- The Coastal Zone Management Act (16 USC § 1451–1464, 15 CFR § 930) is a potential ARAR because IR Site 27 is adjacent to Seaplane Lagoon, which is contiguous with San Francisco Bay.

Substantive requirements of the following requirements of the California Civil Code and the California Health and Safety Code (HSC) have been determined to be state action-specific ARARs for implementation of institutional controls for property that will be transferred to a nonfederal agency:

- Cal. Code Regs. tit. 22 § 67391.1, Land Use Covenants
- HSC §§ 25202.5; 25222.1; 25355.5(a)(1)(C), 25233(c) and 25234

Substantive requirements of the following provisions of Cal. Code Regs. tit. 22 have been determined to be federal action- or chemical-specific ARARs:

- Determination of RCRA-characteristic hazardous waste: Cal. Code Regs. tit. 22 §§ 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100(a)(1)
- On-site waste generation: Cal. Code Regs. tit. 22 §§ 66262.10(a), 66262.11, and 66264.13(a) and (b)
- Hazardous waste accumulation: Cal. Code Regs. tit. 22 § 66262.34
- The substantive requirements of hazardous waste container storage regulations: Cal. Code Regs. tit. 22 §§ 66262.171, .172, .173, .174, .175(a) and (b), .177, and .178

1

Overall Protection of Human Health and the Environment

How risks are eliminated, reduced or controlled through treatment, engineering or institutional controls.



2

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Federal and state environmental statutes met and/or grounds for waiver provided.



3

Long-term Effectiveness

Maintain reliable protection of human health and the environment over time, once cleanup goals are met.



4



Reduction of Toxicity, Mobility or Volume (TMV) Through Treatment

Ability of a remedy to reduce the toxicity, mobility and volume of the hazardous contaminants present at the site.

5

Short-term Effectiveness

Protection of human health and the environment during construction and implementation period, and time to reach remediation goals.



6



Implementability

Technical and administrative feasibility of a remedy, including the availability of materials and services to carry it out.

7

Cost

Estimated capital, operation and maintenance costs of each alternative.



8



State Acceptance

State concurs with, opposes, or has no comment on the preferred alternative.

9

Community Acceptance

Community concerns addressed; community preferences considered.



Final Remedy

Figure 4. Nine Alternatives Evaluation Criteria

- is effective over the long term and is a permanent solution;
- effectively reduces toxicity, mobility, or volume via treatment;
- has the shortest duration for accomplishing the remediation goals (3 years); and
- has the lowest total cost (\$2.08 million).

During the RI, the following data gaps were identified at the site: no groundwater sampling has been conducted in and adjacent to a washdown area (WD-166 and related oil/water separators); and no soil sampling for polychlorinated biphenyls (PCBs) has been conducted at Building 555 (an electrical substation). The data gap sampling will be addressed during the remedial design phase.

SUMMARY STATEMENT

Based on information currently available, the preferred alternative for groundwater meets the NCP threshold criteria and satisfies the following statutory requirements of CERCLA 121(b):

1. Protective of human health and the environment
2. Compliant with ARARs

3. Cost effective
4. Uses permanent solutions and alternative treatment technologies to the maximum extent practicable

OPPORTUNITIES FOR PUBLIC INVOLVEMENT
Information Repositories

Individuals interested in the full technical details beyond the scope of this Proposed Plan can find more detailed documents at the local Information Repository in Alameda:

- Alameda Point – 950 West Mall Square, Bldg 1, Rooms 240 and 241

Supporting documents describing the field investigation, laboratory analysis, and risk assessment are part of the Alameda Point *Administrative Record (AR)* and are available for your review at the Information Repository in Alameda. These reports include:

- 2006 – Final Feasibility Study Report for IR Site 27
- 2005 – Final Remedial Investigation Report for IR Site 27

Table 6. Comparative Analysis of Alternatives for Inland Groundwater

	1	3	4A	6A	6B	7
NCP Criteria	No Action	MNA, ICs	ISB, MNA, ICs	ISCO, MNAs, ICs	Full-Scale ISCO, GW Sampling	DSC, MNA, ICs
Overall Protectiveness	No	Yes	Yes	Yes	Yes	Yes
ARARs Compliance	No	Yes	Yes	Yes	Yes	Yes
Long-term Effectiveness and Permanence	None	●	●	●	●	●
Reduction of Toxicity, Mobility, or Volume through Treatment	None	○	●	●	●	●
Short-term Effectiveness	None	●	●	●	●	○
Implementability	None	●	●	●	○	●
Cost (\$M)	0	2.75	3.03	2.22	2.08	3.03
State Acceptance	State Concurs with Proposed Remedy					
Community Acceptance	To be evaluated after the Public Comment Period					

Alternative 6B is the Preferred Alternative

- = low
- = moderate
- = high

- DSC Dynamic Subsurface Circulation
- GW Groundwater
- IC Institutional control
- ISB In situ bioremediation
- ISCO In situ chemical oxidation
- MNA Monitored natural attenuation
- NCP National Oil and Hazardous Substances Pollution Contingency Plan

PUBLIC COMMENT PERIOD

The public comment period for the Proposed Plan is November 20, 2006 through December 22, 2006.

Submit Comments

There are two ways to provide comments during this period:

- Offer oral comments during the public meeting
- Provide written comments by mail, email or fax (no later than December 22, 2006)



Public Meeting

The public meeting will be held on Tuesday, December 12, 2006 at Alameda Point, 950 West Mall Square, Room 201 from 6:30 p.m. to 8:00 p.m. It will be an opportunity to discuss the information presented in this Proposed Plan. Navy representatives will provide visual displays and information on the environmental investigations and the cleanup alternatives evaluated. You will have an opportunity to ask questions and formally comment on this Proposed Plan.



Send Comments to:

Mr. Thomas Macchiarella
BRAC Environmental Coord.
Department of the Navy
BRAC PMO West
1455 Frazee Road, Suite 900
San Diego, CA 92108-4310
Phone (619) 532-0907

Fax (619) 532-0940

thomas.macchiarella@navy.mil



Administrative Record – A Source for Reports and Studies

The AR is the collection of reports and historical documents used by the decision-making team in selecting the cleanup or environmental management alternatives for a site. The AR file is located at:

- **Naval Facilities Engineering Command Southwest**
1220 Pacific Highway
San Diego, CA 92132-5190
ATTN: Ms. Diane Silva, FISC Bldg 1,
3rd Floor
Phone: (619) 532-3676

You may view these documents by appointment during working hours (Monday through Friday, 8 a.m. to 5 p.m.). Please contact Ms. Silva at the number provided to make an appointment.

Did You Know...?

You can read more about the Department of the Navy's environmental program at Alameda Point on the Internet at:

<http://www.bracpmo.navy.mil>

SITE CONTACTS

Community involvement in the decision-making process is encouraged. If you have any questions or concerns about environmental activities at Alameda Point, please feel free to contact any of the following project representatives:

Mr. Thomas Macchiarella

BRAC Environmental Coordinator
Department of the Navy
BRAC Program Management Office West
1455 Frazee Road, Suite 900
San Diego, CA 92108-4310
(619) 532-0907

Ms. Anna-Marie Cook

Project Manager
U.S. EPA, Region 9
75 Hawthorne Street
San Francisco, CA 94105
(415) 972-3029

Ms. Dot Lofstrom

Project Manager
Department of Toxic Substances Control
8800 California Center Drive
Sacramento, CA 95826
(916) 255-6499

Mr. Erich Simon

Project Manager
San Francisco Bay RWQCB
1515 Clay Street, Suite 1400
Oakland, CA 94612
(510) 622-2355

Multi-Agency Environmental Team Concurs with Preferred Remedy

The *BRAC Cleanup Team (BCT)*, which has been working cooperatively to address remedial decisions for Alameda Point, concurs with this proposed plan for IR Site 27:

- The Navy
- EPA Region 9
- DTSC
- San Francisco Bay Water Board

GLOSSARY OF TECHNICAL TERMS

Administrative Record (AR) – The reports and historical documents used in selection of clean-up or environmental management alternatives.

Air sparging – A technology that introduces air into groundwater as an oxygen source at a low, controlled flow rate for aerobic degradation, thereby accelerating naturally occurring aerobic biodegradation processes

Air stripping – A treatment system that removes volatile organic compounds from contaminated groundwater by forcing an air stream through the water and causing the compounds to evaporate.

Applicable or Relevant and Appropriate Requirements (ARARs) – Federal or State (if more stringent) environmental standards, requirements, criteria, or limitations.

BRAC Cleanup Team (BCT) – The Base Realignment and Closure cleanup team consisting of representatives from the Navy, EPA, DTSC, and RWQCB.

Base Realignment and Closure (BRAC) Program – Program established by Congress under which Department of Defense installations undergo closure, environmental cleanup, and property transfer to other federal agencies or communities for reuse.

Biodegradation – The destruction of contaminants by microscopic organisms in groundwater.

California Environmental Protection Agency Department of Toxic Substances Control (DTSC) – Part of California's environmental protection agency (Cal/EPA) herein referred to as DTSC.

Clean-up goals – A quantitative means of identifying areas for potential remedial action, for screening the types of appropriate technologies, and for assessing a remedial action's ability to achieve the RAOs.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) – Also known as Superfund, this federal law regulates environmental investigation and cleanup of sites identified as possibly posing a risk to human health or the environment.

Ecological Risk Assessment (ERA) – The evaluation of potential hazard to plants, animals, and habitat as a result of environmental exposure to chemicals.

Exposure Pathway – A mechanism by which a chemical comes into contact with a living organism.

Feasibility Study (FS) – The analysis of proposed remedial alternatives to evaluate their effectiveness in reduction of risk to human health and the environment. The FS follows Remedial Investigation.

Groundwater – Water within the earth that flows through permeable rock, sand, or gravel.

Hazard Index (HI) – A calculated value used to represent a potential non-cancer health risk. An HI value of less than or equal to 1 is considered to be an acceptable exposure level.

Human Health Risk Assessment (HHRA) – Estimate of potential harmful effects humans may experience as a result of exposure to chemicals.

In Situ - A term meaning "in place"; in this context it refers to treating soil or groundwater without removing it from the ground.

In Situ Bioremediation - A treatment involving injection of chemicals into contaminated groundwater to accelerate the natural degradation of contaminants into non-harmful byproducts.

In Situ Chemical Oxidation - A treatment that accelerates the breakdown of contaminants by injecting oxidizing chemicals into groundwater.

Institutional Controls (ICs) – Administrative and legal controls, established and administered to restrict use of property to limit human exposure to contaminated waste, soil, sediment, or groundwater and protect the integrity of the remedy.

Installation Restoration (IR) Program – The Department of Defense's comprehensive program to investigate and clean up environmental contamination at military facilities in full compliance with CERCLA.

Maximum Contaminant Level (MCL) – The maximum permissible level of a contaminant in water delivered to any user of a public system. MCLs are enforceable standards.

Monitored Natural Attenuation (MNA) – The careful tracking of natural in-situ processes that degrade groundwater contamination.

National Oil and Hazardous Substances Contingency Plan (NCP) – The federal regulation that guides the CERCLA (Superfund) program.

Polynuclear Aromatic Hydrocarbon (PAH) – Specific class or group of semivolatile organic compounds whose molecules consist of multiple benzene rings. "Polynuclear" means multi-ringed. Some are suspected as cancer-causing compounds and are commonly associated with fuels and waste oil.

Record of Decision (ROD) – A legal document that explains the selected cleanup method to be used. It is signed by the Navy and regulatory agencies and is a binding agreement regarding how and when a site remediation is conducted.

Regional Water Quality Control Board (Water Board) – Part of Cal/EPA and serves as the California water quality authority.

Remedial Action Objective (RAO) – A set of statements that each contains a goal for the protection of one or more receptors from one or more chemicals in a specific medium (such as soil, groundwater, or air) at a site.

Remedial Alternative - An alternative or option for cleaning up a site.

Remedial Investigation (RI) – A study designed to determine the nature and extent of contamination at the site. The RI precedes the FS.

Remediation Goal (RG) – Chemical concentration limits that provide a quantitative means of identifying areas for potential remedial action, screening the types of appropriate technologies, and assessing a remedial action's potential to achieve the RAO.

Risk – Likelihood or probability that a hazardous substance released to the environment will cause adverse effects on exposed human or other biological receptors. Classified as carcinogenic (cancer-causing) or non-carcinogenic.

Risk Management Range – A federally established range used by risk managers to determine if further action is needed to reduce risk to human health or the environment.

Soil Vapor Extraction – Process by which contaminant vapors in the soil are extracted and treated.

Volatile Organic Compound (VOC) - An organic (carbon-containing) compound that evaporates readily at room temperature. VOCs are found in industrial solvents commonly used in dry cleaning, metal plating, and machinery degreasing operations.

Proposed Plan Comment Form
Alameda IR Site 27 Groundwater

The public comment period for the Proposed Plan for IR Site 27 Groundwater, Former Naval Air Station (NAS) Alameda at Alameda Point, Alameda, California is from November 20, 2006 through December 22, 2006. A public meeting to present the Proposed Plan will be held at the Alameda Point Main Office Building, Room 201, 950 West Mall Square, Bldg. 1, Alameda, California on December 12, 2006 from 6:30 to 8:00 pm. You may provide your comments orally at the public meeting where your comments will be recorded by a court reporter. Alternatively, you may provide written comments in the space provided below or on your own stationery. All written comments must be postmarked no later than December 22, 2006. You may also submit this form to a Navy representative at the public meeting. Comments are also being accepted by e-mail and fax. Please address e-mail comments to thomas.macchiarella@navy.mil, or fax to (619) 532-0940.

Name: _____

Representing:
(if applicable) _____

Phone Number:
(optional) _____

Address:
(optional) _____

Please check here if you would like to be added to the Navy's Environmental Mailing List for Alameda Point.

Comments:

Mail to:
Thomas Macchiarella
BRAC Environmental Coordinator
BRAC Program Management Office West
1455 Frazee Road, Suite 900
San Diego, CA 92108-4310

Ms. Tommie Jean Darnel
Community Involvement Coordinator
SulTech
135 Main Street, Suite 1800
San Francisco, CA 94105



Proposed Plan for IR Site 27, Dock Zone Former NAS Alameda

**BRAC
PMO**