PROPOSED PLAN/DRAFT REMEDIAL ACTION PLAN
FORMER NAVAL STATION TREASURE ISLAND
Installation Restoration Site 6

San Francisco, California

February 2014

INTRODUCTION

The Department of the Navy (Navy) presents this Proposed Plan/Draft Remedial Action Plan (RAP) for remediation of Installation Restoration Site 6 at the former Naval Station Treasure Island (NAVSTA TI) (Figure 1). The Navy conducted environmental investigations at Site 6; this property included a former fire training school and a former parking and storage area.

This **Proposed Plan/Draft RAP**[1] presents several remedial (cleanup) alternatives and identifies the Navy's preferred alternative. The Navy, in consultation with the U.S. Environmental Protection Agency (EPA), the California Department of Toxic Substances Control (DTSC), and the San Francisco Bay Regional Water Quality Control Board (Water Board), will select a remedial action for the site in the **Record of Decision (ROD)/Final RAP** after all information submitted during the public comment period on the Proposed Plan/Draft RAP has been reviewed and considered. The Navy may modify the preferred alternative or select another remedial alternative presented in this Proposed Plan/Draft RAP based on new information or public comments. Therefore, the public is encouraged to review and comment on all of the alternatives presented in this Proposed Plan/Draft RAP. A final decision will not be made until all comments submitted during the review period are considered. See the instructions on how to comment in the text box on page 14.

CONTENTS

This Proposed Plan/Draft RAP summarizes the remedial alternatives the Navy evaluated and explains the basis for identifying the preferred alternative to address contamination at Site 6, NAVSTA TI (Figure 1). The Navy proposes the following actions to address hazardous substances in soil and groundwater at Site 6:

- Remove and dispose of contaminated soil in selected areas.
- Conduct groundwater monitoring.
- Use **institutional controls (IC)** to restrict specific land uses and activities. (See pages 7 and 8 for more details on ICs.)
- Maintain the different parts of the preferred alternative (groundwater monitoring and ICs) to ensure they are working properly.

Public comments will be accepted from February 28, 2014 through March 31, 2014, and public comments can be submitted via mail, e-mail, or fax throughout the comment period. A public meeting will be held from 6:30 p.m. to 8:30 p.m. on March 12, 2014, at the Casa de la Vista, Building 271 on Treasure Island. Members of the public may submit written and oral comments on this Proposed Plan/Draft RAP at the public meeting.

Written comments can be provided any time during the comment period but must be received no later than March 31, 2014. Please refer to page 14 for further information on how to provide comments.

— NOTICE —

Public Comment Period
February 28 to March 31, 2014

Public Meeting
March 12, 2014

Casa de la Vista, Building 271
Treasure Island
6:30 p.m. to 8:30 p.m.

[1] Words in **bold** type are defined in the glossary on page 14.

THE CERCLA PROCESS

The Navy is issuing this Proposed Plan/Draft RAP as part of its public participation responsibilities under Section 117(a) of the **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)** and Section 300.430(f)(2) of the **National Oil and Hazardous Substances Pollution Contingency Plan (NCP)**. This Proposed Plan has been prepared to highlight key information and conclusions presented in the final **remedial investigation/feasibility study (RI/FS)** report, issued in 2012. The Navy has conducted numerous environmental investigations at NAVSTA TI since the mid-1980s. These investigations have identified contamination that poses a potential risk to human health and the environment. The flowchart to the right illustrates the status of Site 6 in the CERCLA process (Figure 2). The Navy received public input during development of the RI/FS report, and this input helped identify the remedial alternatives discussed in this Proposed Plan/ Draft RAP. The Navy's preferred alternative to address contamination at Site 6 is presented in this Proposed Plan/ Draft RAP.

The ROD/Final RAP will present the selected remedial alternative, identify the **remedial action objectives (RAO)** and **remediation goals (RG)**, and outline performance standards that must be met when cleanup is complete. After the ROD/Final RAP, the **remedial design (RD)** and remedial action are the next steps in the CERCLA process and involve planning and implementing the selected remedial action. Site closure is achieved when remedial action is complete. The RI/FS report and other documents that provide information about the conditions and Navy activities at Site 6 are available for public review at the locations listed on page 13.

SITE BACKGROUND

Treasure Island was constructed from San Francisco Bay fill in the 1930s for use during the World Exposition in 1939. Navy operations at the island began in 1941, primarily for training, administration, housing, and other support services to the U.S. Pacific Fleet. In 1993, the Defense Base Realignment and Closure (BRAC) Commission recommended closure of NAVSTA TI; the facility was subsequently closed on September 30, 1997. NAVSTA TI is planned for transfer to the City and County of San Francisco for reuse and redevelopment.

Site 6 is located in the northeastern portion of NAVSTA TI (Figure 1) and was in operation between 1944 and 1992 for various firefighting training activities. Site 6 covers 4.54 acres (Figure 3) and consists of a larger rectangular area where the Former Fire Training School was located (subarea 1 and subarea 2), and a smaller wedge-shaped area of the northeast portion of the site that was used for parking and storage only (subarea 3). The three subareas shown on Figure 3 are related to the Human Health Risk Assessment discussed under the

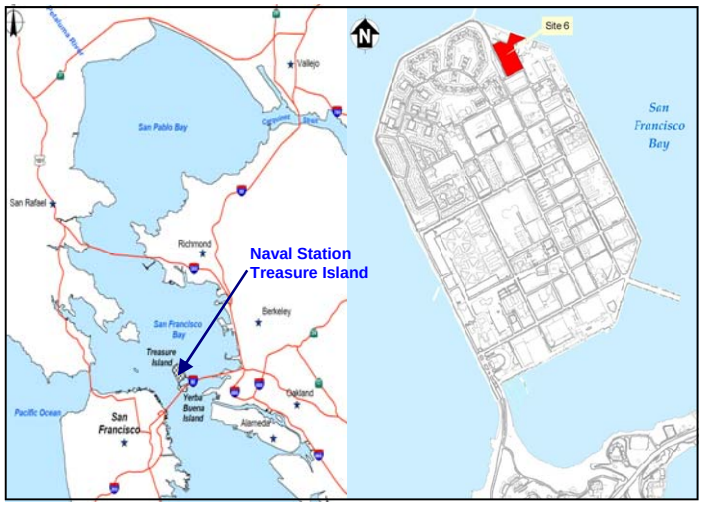

Figure 1. Location of Former Naval Station Treasure Island and Site 6

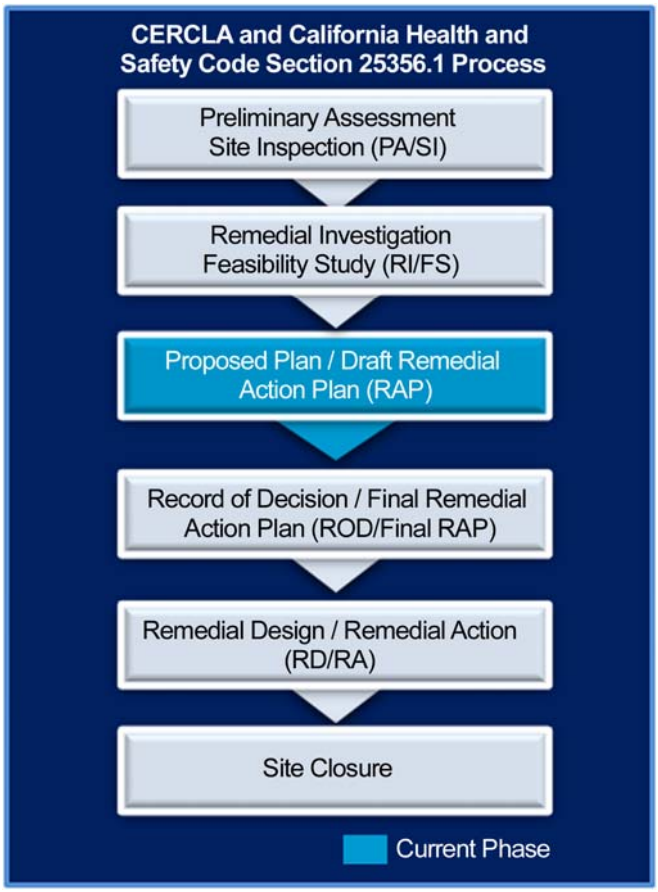

Figure 2. Current Phase in CERCLA and California HSC Process

"Summary of Site Risks" on page 5. The Former Fire Training School included 10 buildings, six underground storage tanks (UST), one aboveground storage tank (AST), and a central concrete-paved training pad and surrounding collector trench.

During fire training exercises, petroleum-, magnesium-, and wood-fueled fires were set in various mockups at the Former Fire Training School Area and then extinguished

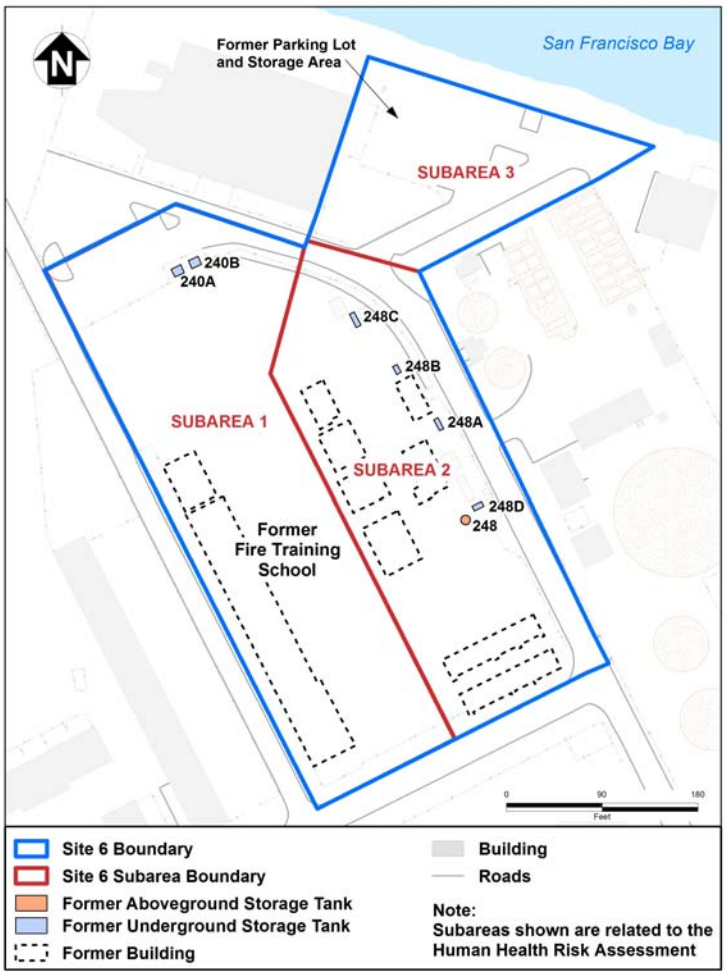

Figure 3. Site 6 Former Facilities

using a mixture of water and biodegradable emulsifiers. Liquid fuels used in the fire training activities were stored in USTs located in the northern portion of the site (UST 240A-B Area) and in the east-central portion of the site (UST 248A-D Area).

All buildings were demolished and removed from the site in 1993. The main portion of the site is secured by chain-link fencing and is currently being used as a temporary staging area for low-level radiological waste contained in roll-off bins to support ongoing cleanup actions for other parts of NAVSTA TI. The former parking and storage area is also secured with fencing and is currently being managed to support ongoing environmental restoration actions.

The Navy initially managed Site 6 under the **Installation Restoration (IR) Program** during the **preliminary assessment/site inspection (PA/SI)** and early RI work spanning the late 1980s through the mid-1990s. Site contaminants in soil and groundwater were found to be mainly petroleum hydrocarbons, and Site 6 was moved into the Navy's Petroleum Program in 1997. During petroleum cleanup actions in the early 2000s, **dioxins and furans** (CERCLA contaminants) were discovered in soil, and the Navy transferred Site 6 back into the IR Program in 2003.

NATURE AND EXTENT OF CONTAMINATION

The nature and extent of contamination at Site 6 are based on more than two decades of environmental investigations and cleanup actions that have been implemented before and after closure of NAVSTA TI. Data collected from these investigations and actions includes laboratory testing of numerous soil, **soil gas**, and **groundwater** samples. The collective data from these efforts have been analyzed and presented in the final Site 6 RI/FS report. Based on the findings of the RI/FS, contaminants in soil at Site 6 include dioxins and furans, **total petroleum hydrocarbons (TPH), volatile organic compounds (VOC)**, **semivolatile organic compounds (SVOC)**, **polychlorinated biphenyls (PCB)**, **methylchlorophenoxypropionic acid (MCPP, a common herbicide)**, arsenic, and manganese. These compounds and metals are considered **chemicals of concern (COC)** and/or **chemicals of ecological concern (COEC)** in soil at Site 6 because they are present at levels that could present potential **risk** to humans or environmental **receptors** (wildlife) if not addressed by further response.

COCs in soil gas include VOCs and naphthalene, a SVOC. Elevated concentrations of these contaminants were reported at the former UST 240A-B and former UST 248 areas (Figure 3). A recent cleanup action at the UST-240 area excavated petroleum-contaminated soil down to a depth of 8 feet below ground surface (bgs). This action removed the source of soil gas COCs that were present in this area, and soil gas is no longer of concern as a contaminated medium in the UST 240 area. Overall, the nature and extent of these chemicals in soil, soil gas, and groundwater at Site 6 have been defined by the existing data; however, data gaps in soil gas remain that will be addressed prior to or during the RD.

During the RD, the Navy will collect additional soil gas data for naphthalene at the southeast portion of Site 6. The data will be evaluated to determine whether naphthalene in soil gas is present at levels that may be of concern at this area. Groundwater COCs and COECs at Site 6 were limited to the former UST 240 area and included petroleum-type VOCs, a few SVOCs, TPH, and metals. However, the Navy has recently completed a petroleum corrective action at the UST 240 area to remove soil contamination that includes VOCs, SVOCs and TPH compounds as detailed in the "Post Construction Summary Report for the UST and AST 240 Area" issued in July 2013. This action met the corrective action objectives and removed approximately 800 cubic yards of soil with 7,381 pounds of residual fuel hydrocarbons that could have otherwise continued to leach from the soil into groundwater. During the removal action, a groundwater monitoring well located within the area of soil excavation at the former UST 240 area was removed and replaced

with a new monitoring well after backfilling. An additional monitoring well was placed downgradient of the soil removal area in accordance with the work plan for the petroleum corrective action. Initial sample results from this well have shown no hydrocarbon sheen and an overall order of magnitude reduction of TPH concentrations in groundwater.

Figure 4, a 3-dimensional **conceptual site model (CSM)** developed during the Site 6 RI/FS, illustrates the nature and extent of soil and groundwater contamination at that time. Viewed looking toward the west, the CSM shows the historical sources of these contaminants at the Former Fire Training School and the pathways and other factors that influenced contaminant distribution in unsaturated, or vadose zone, soil and underlying groundwater located approximately 6 feet bgs.

The CSM shows that dioxins and similar compounds were deposited in shallow soil when fuel products were burned, mainly at areas where burning occurred and by deposition downwind. Other contaminants in soil such as VOCs, SVOCs, and TPH are primarily related to former UST releases and spills. Other minor soil contaminants not shown in Figure 4 include PCBs and MCPP. PCB contamination in shallow soil originated from two electrical transformer spills at the Fire Training School and the Former Parking and Storage Area. MCPP was found at elevated concentrations only at the UST 240 area, indicating a localized spill during routine weed control.

The CSM also shows groundwater contamination that includes petroleum VOCs, SVOCs, TPH, and arsenic resulted from UST leaks and use of fuel products during fire fighting training. These contaminants migrated down through the soil and entered groundwater. Their distribution in groundwater has also been influenced by the direction of groundwater flow and by tidal action. Elevated arsenic in groundwater is also associated with UST releases and spills. The RI/FS concluded that petroleum contaminants migrating downward through soil create reducing conditions that can promote mobility of naturally occurring arsenic, causing arsenic to partially leach into groundwater.

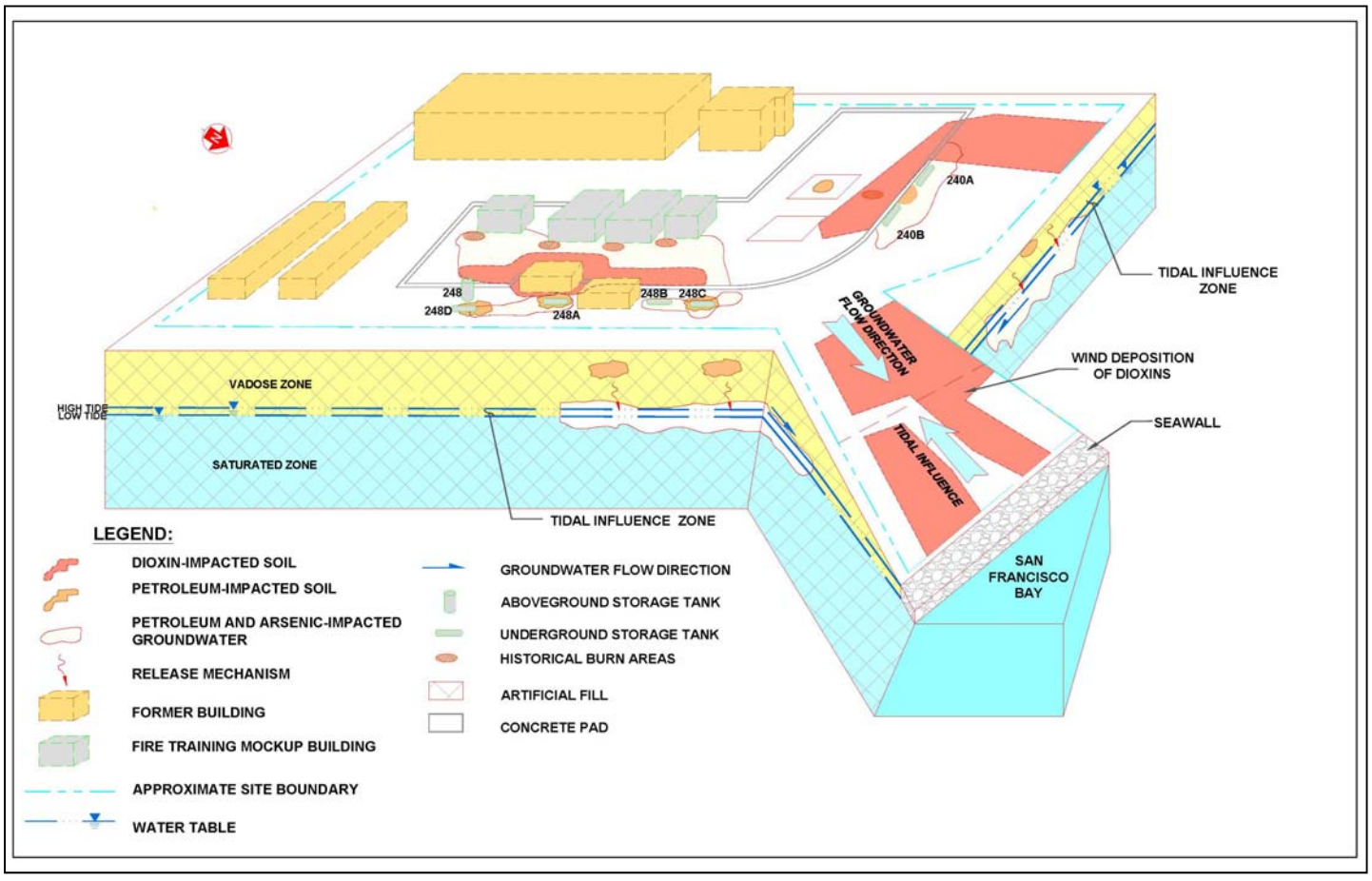

Figure 4. Conceptual Site Model for Site 6

SUMMARY OF SITE RISKS

Risk is the likelihood or probability that a hazardous chemical, when released to the environment, will cause effects (such as cancer or other illnesses) on exposed humans or wildlife. The Navy evaluated the risk to humans and wildlife from exposure to contaminated soil, soil gas, and groundwater. Table 1 shows the list of **exposure pathways** and human receptors considered in the **human health risk assessment (HHRA)**. The risk calculations were based on site conditions prior to the cleanup. The risk assessment results are summarized below.

Human Health Risk Assessment

The Navy evaluated risk to human health at Site 6 in the HHRA that was presented in the RI/FS report for Site 6. The Navy considered the various ways that humans might be exposed to chemicals (see Table 1), the possible concentrations of chemicals that could be encountered during exposure, and the potential frequency and duration of exposure (referred to as "exposure scenarios"). These exposure scenarios depend on the future use of the land. The Navy evaluated risk using an exposure scenario for a recreational user, for an occupational worker, and for a construction worker. Baseline HHRAs follow an established process recognized by the EPA, DTSC, and other agencies. Steps in the process include evaluating soil, soil gas, and groundwater data to identify and quantify concentrations of COCs in these media; determining exposure scenarios and exposure pathways to these COCs; classifying their toxicity; and estimating site-specific intake rates. Classification of chemical toxicity determines whether COCs may cause cancer (**cancer risk**) or may have other adverse health effects (**noncancer hazard**). Once this process is completed, cancer and noncancer risks are calculated for each COC. The HHRA then sums the risk for individual COCs to develop total cancer and noncancer risks for all media, exposure scenarios, and human receptors, such as recreational users, industrial workers, or construction workers.

Table 1. Total Cancer and Noncancer Risks

Receptor [a]	Exposure Pathway	Cancer Risk [b]	Hazard Index [c]
Subarea 1 – Western half of the Former Fire Training School			
Future Land Use			
Recreational User	Surface Soil (0 to 2 feet bgs)	5×10^{-5}	4
Recreational User	Subsurface Soil (0 to 8 feet bgs)	3×10^{-5}	8
Construction Worker			
Construction Worker	Subsurface Soil (0 to 8 feet bgs), Groundwater, and Trench Vapors	2×10^{-5}	20
Subarea 2 – Eastern half of the Former Fire Training School			
Future Land Use			
Recreational User	Surface Soil (0 to 2 feet bgs)	8×10^{-5}	7
Recreational User	Subsurface Soil (0 to 8 feet bgs)	5×10^{-5}	5
Occupational Worker	Surface Soil (0 to 2 feet bgs) and Indoor Vapor Intrusion	3×10^{-5}	1
Occupational Worker	Subsurface Soil (0 to 8 feet bgs) and Indoor Vapor Intrusion	2×10^{-5}	0.7
Construction Worker			
Construction Worker	Subsurface Soil (0 to 8 feet bgs), Groundwater, and Trench Vapors	5×10^{-6}	5
Subarea 3 – Former Parking and Storage Area			
Future Land Use			
Recreational User	Surface Soil (0 to 2 feet bgs)	2×10^{-5}	1
Recreational User	Subsurface Soil (0 to 8 feet bgs)	7×10^{-6}	2
Construction Worker			
Construction Worker	Subsurface Soil (0 to 8 feet bgs), Groundwater, and Trench Vapors	5×10^{-7}	6

Notes:
a Receptors include those expected under reasonably anticipated future land use consistent with the EPA's land use directive.
b Risk from cancer is expressed as a probability such as 1 in 1,000,000 (also expressed as 10^{-6}). This means that one person in a population of 1,000,000 is more likely to develop cancer over his or her lifetime.
c Noncancer risk is expressed in a hazard index. A hazard index value of 1 or less is considered protective of human health.
bgs Below ground surface

Cancer risks are calculated in terms of the number of cancer cases that may result within a given population. Cancer risk is the estimated probability that a person will develop cancer from exposure to site contaminants and is generally expressed as a probability. For example, a 1 in 10,000 chance is a risk that for every 10,000 people, one additional cancer case may occur as a result of exposure to site contaminants, and this probability is expressed as 1 divided by 10,000, which is equal to 0.0001. EPA typically expresses very small numbers in scientific notation; for example, 0.0001 becomes 10^{-4}, which shows that the decimal point must be moved four spaces to the left of the number 1.0 to write the probability in regular notation. Similarly, a 1 in 1,000,000 chance is a risk that for every 1,000,000 people, one additional cancer case may occur as a result of exposure to site contaminants (i.e., expressed as 0.000001 or 10^{-6}). EPA considers cancer risks falling within a range between 10^{-4} and 10^{-6} to be generally acceptable, often referred to as the **risk management range** when site cleanup decisions are being made. Risks less than 10^{-6} are considered acceptable. Risks greater than 10^{-4} are generally not acceptable and may indicate the need for further evaluation.

Noncancer risks assessed in HHRAs are expressed as a number called the **hazard index (HI)**. An HI value of 1 or less indicates that adverse noncancer human health effects are not expected to occur. An HI greater than 1 indicates that further evaluation may be required, such as a target organ analysis that assesses effects of chemicals on specific organs of the human body.

The HHRA for Site 6 evaluated exposure pathways to COCs within soil, soil gas, and groundwater. These pathways include direct contact with soil, inhalation of subsurface soil vapors that could migrate into buildings or trenches, and direct contact with groundwater. The HHRA assumed that soil exposure would be limited to surface soil (0 to 2 feet bgs) if redevelopment involved only removal of paving and other shallow features, or could include subsurface soil (0 to 8 feet bgs) if redevelopment involved disturbance of deeper soil by trenching or excavation work. Human receptors were identified based on anticipated redevelopment of the site. Potential future receptors included recreational users and occupational and construction workers.

Based on historical land use and contaminant distribution, the HHRA subdivided Site 6 into three major exposure units, consisting of subarea 1 – western half of the rectangular area that encompasses the Former Fire Training School, subarea 2 – eastern half of the rectangular area that encompasses the Former Fire Training School, and subarea 3 – Former Parking and Storage Area at the northeast wedge-shaped portion of the site (Figure 3). Table 1 presents total cancer risks and noncancer hazard index numbers for the three subareas. The table includes risks associated with reasonably anticipated land uses, consistent with the EPA's land use directive for CERCLA remedy selection.

The total cancer risks shown in Table 1 for a future recreational user and construction worker at subarea 1 are within the cancer risk management range of 10^{-4} to 10^{-6}, but the total site HIs are greater than 1. At subarea 2, the total cancer risks for all future receptors are within the cancer risk management range. The HI is above 1 for the recreational user and construction worker, but is equal to or less than 1 for the occupational worker. At subarea 3, the total cancer risks for all future receptors are within or below the cancer risk management range. The total site HI is equal to or above 1 for the recreational user and construction worker.

Ecological Risk Assessment

Ecological risk assessments are performed using a tiered approach that begins with a **screening level ecological risk assessment (SLERA)** and progresses to more detailed assessment only if needed. A SLERA assesses whether ecological receptors are present at a site, and if so, whether there may be potentially complete pathways. It compares site maximum COEC concentrations with benchmark or guideline values to determine if more analysis may be required.

The SLERA that covered Site 6 evaluated the potential for terrestrial receptors (such as plants, invertebrates, birds, and mammals) to be exposed to contaminated soil. The SLERA did not identify suitable habitat for terrestrial ecological resources at the site and no such habitat was anticipated in the future; therefore, no further evaluation of risk to terrestrial receptors at the site was required. Because the Treasure Island Development Authority is now considering the construction of quality wildlife habitat at Site 6 as documented in the 2011 "Treasure Island and Yerba Buena Island Design for Development," the Proposed Plan/Draft RAP has been revised to include additional ICs to require that the transferee or developer conduct an ecological risk assessment and any additional remedial action necessary to address potential risks to future ecological receptors if the transferee or developer constructs quality wildlife habitat on Site 6. Potential impact to aquatic wildlife in San Francisco Bay was evaluated for chemicals detected in groundwater at Site 6 as part of the RI/FS. This effort included groundwater fate and transport modeling of contaminants discharging to San Francisco Bay. The evaluation concluded that TPH and naphthalene in groundwater pose potential risk to receptors living in the aquatic environment next to San Francisco Bay.

REMEDIAL ACTION OBJECTIVES AND REMEDIATION GOALS

As part of the Site 6 RI/FS, RAOs were developed to identify and screen remedial alternatives that protect human health and the environment and are consistent with reasonably anticipated land use. RAOs are media-specific (such as soil and groundwater) goals for protecting human health and the environment that provide the foundation for developing remedial alternatives. The RAOs are used to develop RGs for receptors exposed to contaminants in soil, soil gas, and groundwater. As mentioned earlier, COCs in soil gas at the UST-240 area have been remediated by a recent petroleum cleanup action. Soil gas RAOs for naphthalene at the southeast portion of Site 6 would only apply for occupational workers in an industrial setting. The Navy will collect data for naphthalene during the RD to evaluate whether this chemical is present in soil gas at levels that may be of concern. A complete list of COCs and corresponding RGs are presented in Table 2. The RAOs for Site 6 were developed for the reasonably anticipated future land use consistent with the EPA's land use directive for CERCLA remedy selection. The Site 6 RI/FS also developed RGs for hypothetical future occupational worker land use, since commercial buildings are a permitted use for former NAVSTA TI open space areas.

SUMMARY OF REMEDIAL ALTERNATIVES

Based on RAOs, the Navy evaluated general response actions, remedial technologies, and process options that could meet these objectives. For soil, the Navy considered placement of protective soil, asphalt, or concrete covers over contaminated soil, soil excavation, and ICs that would prevent access and exposure to specific contaminated soil areas by administrative measures such as deed restrictions. For both the soil and groundwater, the Navy considered a number of ICs, which will be further defined in the RD document. In general, these ICs would restrict:

- "Land disturbing activity," which includes but is not limited to (1) excavation of soil; (2) construction of roads, utilities, facilities, structures, and associated equipment of any kind; (3) demolition or removal of "hardscape" (such as concrete roadways, parking lots, foundations, and sidewalks); (4) any activity that involves movement of soil to the surface from below the surface of the land; and (5) any other activity that causes or facilitates the movement of groundwater known to be contaminated with hazardous substances.
- Alteration, disturbance, or removal of any component of the response action, including but not limited to **covers**, groundwater monitoring wells, and survey monuments.

Table 2. Summary of Remediation Goals

Land Use	COC / COEC	Remediation Goals [a]	
		Soil (mg/kg)	Groundwater (µg/L)
Open Space (Recreational and/ or Construction Worker) **SUBAREAS 1 and 3**	Dioxin TEQ	1.2×10^{-5}	--
	MCPP	85	300
	Benzene	3	94
	Ethylbenzene	--	540
	Naphthalene	--	180
	Xylenes	--	5,500
	1,1,2-Trichloroethane	--	17
	Arsenic	--	250
	Manganese	550 [b]	5,200
	TPH	--	45,500
Public Services, Civic and Institutional (Occupational and/ or Construction Worker) **SUBAREA 2**	Dioxin TEQ	1.6×10^{-5}	--
	Naphthalene	--	56
	MCPP	130	300
	Benzene	1.5	94
	Ethylbenzene	--	540
	Xylenes	--	5,500
	1,1,2-Trichloroethane	--	17
	Arsenic	--	250
	Manganese	--	5,200
	TPH	--	45,500

Notes:

The "--" indicates that this compound does not have a remediation goal for either soil or groundwater because it does not occur at concentrations that could present unacceptable risk to human or ecological receptors.

a Remediation goals are protective of aquatic wildlife in San Francisco Bay based on a highly conservative screening-level analysis conducted using the BIOSCREEN solute transport model as documented in the RI/FS report.

b The manganese remediation goal for soil applies only to Subarea 3.

µg/L Microgram per liter
COC Chemical of concern
COEC Chemical of ecological concern
MCPP Methylchlorophenoxypropionic acid (herbicide)
mg/kg Milligram per kilogram
RI/FS Remedial investigation/feasibility study
TEQ Toxic equivalent
TPH Total petroleum hydrocarbons

- Removal or damage of security features.
- Extraction of groundwater and installation of new groundwater wells.
- Construction of enclosed structures within areas containing unacceptable levels of VOC vapors.

- Construction of the following structures: (1) a residence, including any mobile home or factory built housing, constructed or installed for use as residential human habitation; (2) a hospital for humans; (3) a school for persons under 21 years of age; or (4) a daycare facility for children.
- Growing produce in soil for human consumption.
- Use of groundwater.
- "The construction of wildlife habitat" by requiring that the transferee or developer conduct an ecological risk assessment and any additional remedial action necessary to address potential risks to future ecological receptors if the transferee or developer develops quality wildlife habitat on Site 6.

Remedial alternatives were developed in the RI/FS for soil, and groundwater from this process. Four remedial alternatives were developed for soil to address potentially unacceptable risk to human receptors.

- Alternative S-1: No Action
- Alternative S-2: Covers and ICs
- Alternative S-3: Excavation and Off-Site Disposal of Top 2 Feet of Soil and ICs
- **Alternative S-4: Excavation and Off-Site Disposal of Unsaturated Zone Soil and ICs**

Based on the HHRA, groundwater at Site 6 poses potentially unacceptable risk to future occupational workers and construction workers. The SLERA determined that COECs in groundwater pose potential risk to aquatic wildlife in San Francisco Bay. Therefore, five remedial alternatives were developed for groundwater:

- Alternative GW-1: No Action
- **Alternative GW-2: ICs and Groundwater Monitoring**
- Alternative GW-3: **Soil Vapor Extraction (SVE)** with Air Sparging, **Bioventing** and **Biosparging**, **Monitored Natural Attenuation (MNA)**, and ICs
- Alternative GW-4: **In Situ Bioremediation (ISB)** with Amendments, MNA, and ICs
- Alternative GW-5: Excavation of **Saturated Zone** Soil, MNA, and ICs

The Navy has identified Alternative S-4 and Alternative GW-2, shown in **bold underline** to left, as the preferred alternatives for soil and groundwater remediation in this Proposed Plan/Draft RAP. The remedial alternatives that were considered in the RI/FS and their estimated costs are described in Table 3. Those costs were developed for comparison purposes and will be refined during the RD of the selected alternative.

EVALUATION OF ALTERNATIVES

The remedial alternatives represent a range of remediation strategies that fulfill the RAOs associated with COCs and COECs at Site 6. The alternatives were evaluated against the nine NCP criteria listed in Figure 5.

These criteria are used to evaluate the cleanup alternatives proposed for soil and groundwater at Site 6. The first seven criteria are discussed in the following remedial alternatives comparison analysis and also summarized in Table 4 for soil and Table 5 for groundwater. The last two NCP criteria listed in Figure 5 will be addressed through public comment and regulatory agency review periods. The Navy will make the final decision on the remedy for Site 6 after the public input has been received and evaluated.

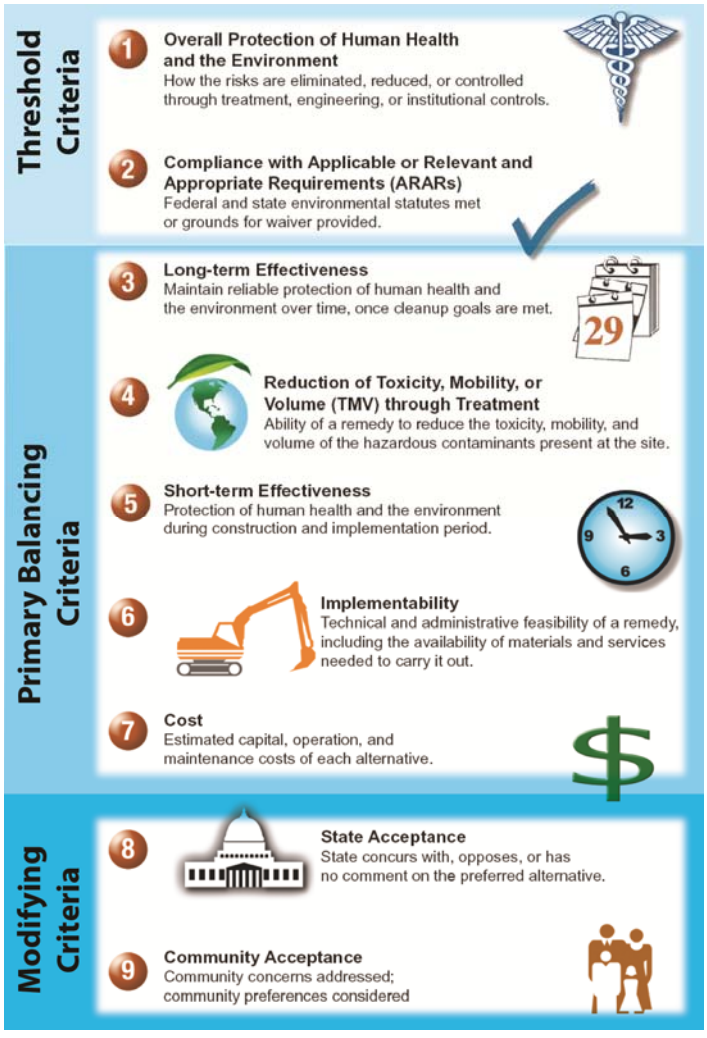

Figure 5. EPA Comparison Criteria

Table 3. Summary of Remedial Alternatives		
Remedial Alternative	**Cost**	**Components of Remedial Alternatives**
Soil		
S-1: No Action	$0	No actions or costs; this alternative is required by CERCLA as a baseline for comparison with other alternatives. Under this alternative, no further remediation would be performed.
S-2: Covers and Institutional Controls (IC)	$960,000	This alternative would involve covers to allow the planned open space and institutional reuse. To accommodate the open space reuse for most of the site, soil covers would primarily be used to facilitate future landscaping. In select areas, asphalt or concrete covers would be used, as appropriate, where paving is required. This alternative would also include ICs that would be implemented to prevent exposure to COCs and COECs in soil and groundwater.
S-3: Excavation and Off-Site Disposal of Top 2 Feet of Soil and ICs	$2,940,000	This alternative would involve excavation of contaminated soil to a maximum depth of 2 feet bgs with off-site disposal of contaminated soil at a permitted disposal facility. This alternative also provides ICs, engineering controls, and monitoring to further limit exposure to the remaining contaminated soil below 2 feet bgs.
S-4: Excavation and Off-Site Disposal of Unsaturated Zone Soil and ICs	$3,520,000	This alternative includes excavation of contaminated unsaturated zone soil (assumed to include soil to a maximum depth of 5.5 feet bgs) with off-site disposal of contaminated soil at a permitted disposal facility. This alternative also provides ICs, engineering controls, and monitoring to further limit exposure to contaminated groundwater. Soil containing COC concentrations that exceed remediation goals would be excavated and removed. Excavated areas would be backfilled with clean soil. An oxygen release compound would be added to excavations prior to backfilling in select areas with groundwater contamination that could recontaminate clean backfill.
Groundwater		
GW-1: No Action	$0	No actions or costs; this alternative is required by CERCLA as a baseline for comparison with other alternatives. Under this alternative, no further remediation would be performed.
GW-2: ICs and Groundwater Monitoring	$920,000	This alternative consists of ICs and groundwater monitoring. Groundwater monitoring would serve a two-fold purpose. It would (1) provide awareness of the size and behavior of COC plumes, helping to ensure that contaminants do not migrate beyond controlled areas, and (2) provide additional information on the size and behavior of plumes to be used in verifying that COCs and COECs in groundwater do not pose potential risks to humans and aquatic wildlife in San Francisco Bay.
GW-3: Soil Vapor Extraction (SVE) with Air Sparging, Bioventing and Biosparging, Monitored Natural Attenuation (MNA), and ICs	$1,650,000	This alternative consists of four process options: (1) SVE with air sparging, (2) bioventing and biosparging, (3) MNA, and (4) ICs. SVE with air sparging and bioventing and biosparging are considered to address primarily saturated zone contamination (i.e., source contamination that produces soil gas and contributes contamination to groundwater) in the UST 240 area, with performance monitoring. Additionally, these process options were retained to address smear zone contamination above the water table. The contaminants to be addressed include VOCs and less volatile petroleum hydrocarbons. Under this alternative, all other areas of saturated zone contamination would be addressed by MNA and ICs.
GW-4: In-Situ Bioremediation (ISB), MNA, and ICs	$1,470,000	This alternative consists of three process options: (1) ISB (aerobic), (2) MNA, and (3) ICs. This alternative addresses sources of organic chemicals in the saturated zone at the UST 240 Area through aerobic bioremediation with amendments. Groundwater would be monitored during the bioremediation and natural attenuation phases of this alternative. ICs would be implemented during active remediation and would remain in effect for as long as COC and COEC concentrations exceed levels that allow for unlimited land use and unrestricted exposure.
GW-5: Excavation of Saturated Zone Soil, MNA, and ICs	$2,350,000	This alternative consists of three process options: (1) excavation of saturated zone soil, (2) MNA, and (3) ICs. This alternative addresses sources of organic chemicals in the saturated zone at the UST 240 Area through excavation (assumed to be between 5.5 and 8 feet bgs) with off-site disposal of contaminated soil at a permitted disposal facility. Groundwater would be monitored during the natural attenuation phases of this alternative. ICs would be implemented during active remediation and would remain in effect for as long as COC and COEC concentrations exceed levels that allow for unlimited land use and unrestricted exposure.

bold underline indicates the preferred alternatives for soil and groundwater remediation in this Proposed Plan/Draft RAP.

bgs	Below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Chemicals of concern
COEC	Chemicals of ecological concern
UST	Underground storage tank

Table 4. Comparative Analysis of Soil Remedial Alternatives

Remedial Alternatives	Overall Protection of Human Health and the Environment	Compliance with ARARs	Long-Term Effectiveness/ Permanence	Reduction of Mobility, Toxicity, or Volume through Treatment	Short-Term Effectiveness	Implement-ability	Cost ($Million)
Alternative S-1: No Action	No	NA	○	◐	NA	●	$0
Alternative S-2: Covers and ICs	Yes	Yes	◑	◐	◑	◑	$0.96
Alternative S-3: Excavation and Off-Site Disposal of Top 2 Feet of Soil and ICs	Yes	Yes	◑	◐	◑	◑	$2.94
Alternative S-4: Excavation and Off-Site Disposal of Unsaturated Zone Soil and ICs	Yes	Yes	◑	◐	◑	◑	$3.52

Notes:
○ Not Acceptable ◐ Poor ◐ Good ◑ Very Good ● Excellent

Bold Preferred Alternative
ARAR Applicable or Relevant and Appropriate Requirements
IC Institutional Controls
NA Not Applicable

Table 5. Comparative Analysis of Groundwater Remedial Alternatives

Remedial Alternatives	Overall Protection of Human Health and the Environment	Compliance with ARARs	Long-Term Effectiveness/ Permanence	Reduction of Mobility, Toxicity, or Volume through Treatment	Short-Term Effectiveness	Implement-ability	Cost ($Million)
Alternative GW-1: No Action	No	NA	○	◐	NA	●	$0
Alternative GW-2: ICs and Groundwater Monitoring	Yes	Yes	◑	◐	◑	●	$0.92
Alternative GW-3: SVE with Air Sparging, Bioventing/Biosparging, MNA, and ICs	Yes	Yes	◑	◑	◑	◑	$1.65
Alternative GW-4: ISB with Amendments, MNA, and ICs	Yes	Yes	◑	◑	◑	◑	$1.47
Alternative GW-5: Excavation and Off-Site Disposal of Saturated Zone Soil, MNA, and ICs	Yes	Yes	◑	◐	◑	◑	$2.35

Notes:
○ Not Acceptable ◐ Poor ◐ Good ◑ Very Good ● Excellent

Bold Preferred Alternative
ARAR Applicable or Relevant and Appropriate Requirements
IC Institutional Controls
ISB In-Situ Bioremediation
MNA Monitored Natural Attenuation
NA Not Applicable
SVE Soil Vapor Extraction

1. Overall Protection of Human Health and the Environment

As shown in Tables 4 and 5, no action Alternatives S-1 and GW-1 do not address any risks at the site and do not provide protection to human health or the environment. The remaining alternatives for soil (Alternatives S-2, S-3, and S-4) and groundwater (Alternatives GW-2, GW-3, GW-4, and GW-5) protect human health and the environment under reasonably anticipated future land uses at Site 6.

2. Compliance with Applicable or Relevant and Appropriate Requirements

Applicable or relevant and appropriate requirements (ARAR) are federal or more stringent state environmental standards, requirements, criteria, or limitations that need to be attained by final remedial actions. There are no ARARs associated with Alternative S-1 or GW-1. The remaining alternatives for soil (Alternatives S-2, S-3, and S-4) and groundwater (Alternatives GW-2, GW-3, GW-4, and GW-5) comply with all of the pertinent ARARs (Tables 4 and 5).

3. Long-Term Effectiveness and Permanence

Alternative S-1 is not acceptable because it does not provide any degree of long-term effectiveness. Alternatives S-2, S-3, and S-4 would provide long-term effectiveness in meeting the RAOs through maintenance of clean soil covers and ICs (Table 4). Alternative S-2 is rated good because direct exposure to contaminated soil would be prevented, but ICs are needed to ensure that the remedy remains effective. Alternatives S-3 and S-4 are rated as very good because contaminated soil would be removed.

Alternative GW-1 is not acceptable because it also does not provide any degree of long-term effectiveness. Alternative GW-2 is rated good because it prevents access to groundwater through ICs; it is a passive technology remedy with an unknown length of time needed to achieve RGs. Alternatives GW-3, GW-4, and GW-5 are rated very good because active technologies would be implemented and COCs would be degraded or removed (Table 5).

4. Reduction of Toxicity, Mobility, and Volume

Alternatives S-1 through S-4 are rated poor because they do not effectively reduce mobility, toxicity, and volume through **treatment actions** (Table 4).

Alternatives GW-1, GW-2, and GW-5 are rated poor because none would reduce the mobility, toxicity, or volume of chemicals through treatment, other than through the natural recovery of the aquifer (Table 5). However, after the RI/FS was finalized, the Navy completed a petroleum corrective action at the UST 240 area, which removed contaminated soil and the source of any continued groundwater contamination. This petroleum corrective action has improved the effectiveness of Alternatives GW-1, GW-2 and GW-5. Alternatives GW-3 and GW-4 were rated very good because they both use active treatment to reduce the toxicity, mobility, and volume of contaminants in groundwater at the site.

5. Short-Term Effectiveness

This criterion does not apply to Alternative S-1, since no action would be taken. Alternatives S-2, S-3, and S-4 are rated very good, as they would introduce minimal risk to the community, workers, and the environment (Table 4).

This criterion also does not apply to Alternative GW-1, since no action would be taken. Alternatives GW-2 and GW-4 are rated very good because safety procedures measures would be implemented to protect site workers installing and using these technologies, and because of the short implementation time. Alternative GW-3 is rated good because more resources would be required to implement the treatment system. Alternative GW-5 is also rated good because it would involve more aggressive field activities that pose greater risk to workers (Table 5).

6. Implementability

Alternative S-1 is rated excellent only because it does not involve remedial technologies or ICs, and therefore is the easiest to implement. Alternatives S-2 through S-4 are rated very good because ICs and the remedial actions are not difficult to implement (Table 4).

Alternative GW-2 is rated excellent because its implementation requires minimal to no construction (Table 5). Alternative GW-3 is rated good because of permitting requirements, larger and more complex biosparging and biovent systems, and greater effort to operate and maintain the treatment system. Alternative GW-4 is rated very good because its system implementation and **operation and maintenance (O&M)** are less difficult, and permitting would not be required. Alternative GW-5 is rated good because of greater difficulty in implementing excavation of saturated zone soil.

7. Cost

No costs are associated with Alternative S-1. Alternative S-2 would incur relatively low costs because it does not include off-site disposal. Alternatives S-3 and S-4 would incur higher costs because they both include excavation and off-site disposal of contaminated soil as process options (Table 4). Alternative S-3 is less expensive because of the lower volume of soil removed.

No costs are associated with Alternative GW-1. Alternative GW-2 would incur low costs because it does not use active remediation systems (Table 5). Alternatives GW-3 and GW-4 would incur moderate costs because they both include construction and implementation of specialized treatment technologies. Alternative GW-5 would be the most expensive of all alternatives because it includes costs for soil removal in the saturated zone using excavation shoring, and off-site disposal. The addition of an IC restricting construction of wildlife habitat in Alternatives S-2 through S-4 has no appreciable impact on the costs discussed herein.

8. Regulatory Acceptance

Regulatory acceptance of the Navy's preferred alternative will be addressed through a responsiveness summary that will be attached to the ROD/Final RAP.

9. Community Acceptance

Community acceptance of the preferred alternatives for soil and groundwater will be evaluated after a public meeting has been held and the public comment period has expired. Comments received from the public will be addressed in a responsiveness summary that will be part of the ROD/Final RAP for Site 6. See page 14 for how to submit comments on this Proposed Plan/Draft RAP.

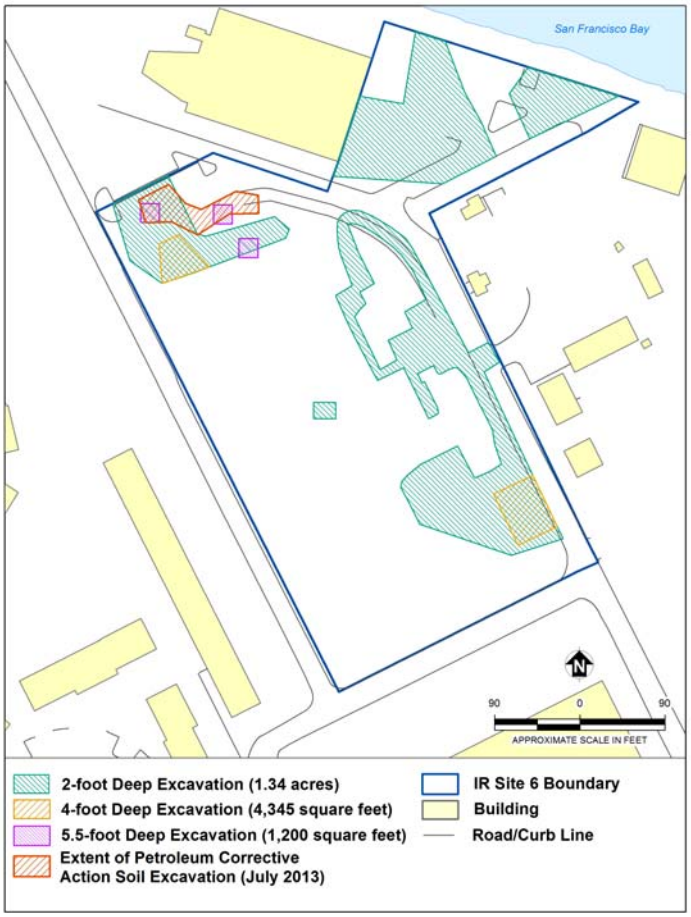

Figure 6. Alternative S-4 – Excavation and Off-Site Disposal of Unsaturated Zone Soil and ICs

SUMMARY OF THE PREFERRED ALTERNATIVES FOR SOIL AND GROUNDWATER

The Navy's preferred remedial alternative for soil is **Alternative S-4: Excavation and Off-Site Disposal of Unsaturated Zone Soil and Institutional Controls.** As shown in Figure 6, this alternative would include excavation of approximately 6,500 cubic yards of contaminated soil in total from the north, eastern half, and northeast portions of Site 6. Alternative S-4 removes contamination within the unsaturated zone to limit exposure and reduce the potential for COCs in soil to contaminate groundwater. Excavation of COCs in soil from 2 feet to 5.5 feet bgs would (1) ensure that exposure pathways would be eliminated for future recreational users and occupational workers at Site 6, (2) prevent exposure to chemicals in soil gas to future occupational workers, and (3) reduce the potential for COCs in soil to migrate into groundwater. As incidental treatment, oxygen release material would be added prior to backfilling in select locations such as the UST 240 area, to stimulate natural biodegradation and potentially reduce the risk of recontamination of backfill soil if a sustained rise in the water table occurs. Implementation of ICs will maintain the integrity of the remedy and prevent unauthorized ground-disturbing activity that could present unacceptable risk. Alternative S-4 would allow Site 6 to be redeveloped and used in a manner consistent with the approved local reuse plan (the reuse plan was published by the Office of Military Base Conversion, Planning Department, City and County of San Francisco, and the San Francisco Redevelopment Agency, in July, 1996), subject to enforcement of appropriate controls for protection of future recreational users, occupational workers, construction workers, and residential receptors.

The preferred alternative for groundwater is **Alternative GW-2: ICs and Groundwater Monitoring**. As shown in Figure 7, this alternative would be implemented at the north portion of Site 6. Alternative GW-2 protects human health and the environment by ICs that prevent use of or exposure to groundwater by anticipated site users and monitoring to ensure ICs remain in place until no longer needed. The alternative will include a groundwater monitoring program that monitors COC and COEC concentrations for this purpose. The alternative could be implemented with minimal effect to the community. Like soil Alternative S-4, groundwater Alternative GW-2 would also allow Site 6 to be redeveloped in a manner consistent with the local redevelopment plan (the reuse plan was published by the Office of Military Base Conversion, Planning Department, City and County of San Francisco, and the San Francisco Redevelopment Agency, in July, 1996).

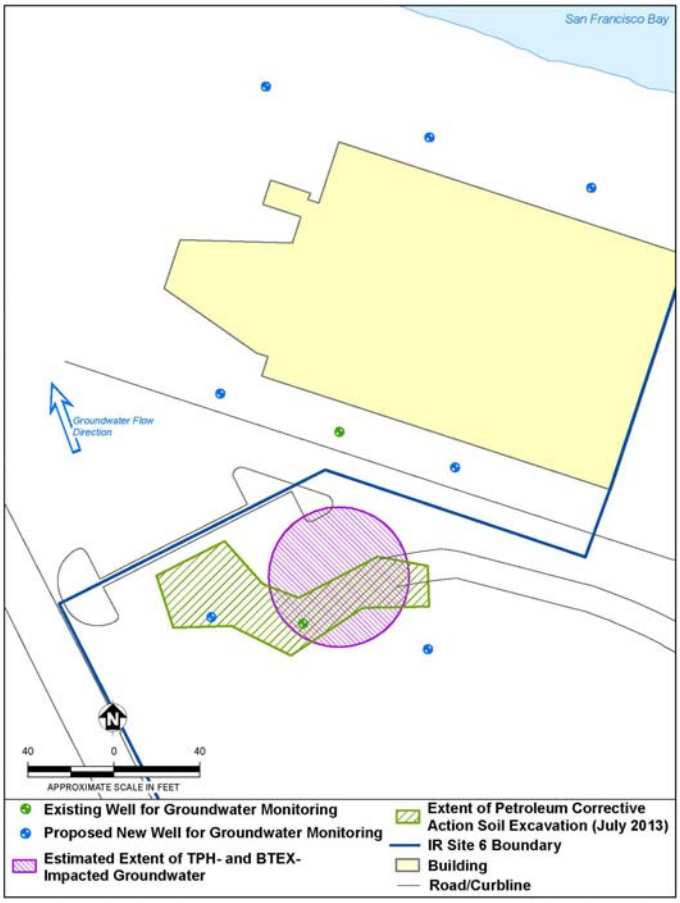

Figure 7. Alternative GW-2 – ICs and Groundwater Monitoring

REGULATORY SUMMARY

California Health and Safety Code

This document meets applicable requirements of the Health and Safety Code (HSC) Section 25356.1 for hazardous substance release sites. The HSC requires preparation of a RAP for sites that are not listed on the National Priorities List (NPL), such as NAVSTA TI. Therefore, this document also serves as a draft RAP to fulfill the public notice and comment requirements of the HSC. The final RAP is the HSC equivalent of the ROD for this site.

California Environmental Quality Act (CEQA)

In compliance with CEQA, DTSC has prepared an Initial Study to evaluate potential impact of the proposed project on the environment. The findings of the Initial Study indicate that the project would not have a significant effect on public health or the environment. Therefore, DTSC has prepared a proposed Negative Declaration for the Site 6 cleanup. Both the Initial Study and proposed Negative Declaration are available for review and comment during the public comment period.

THE NEXT STEP

After the comment period has ended, the Navy, DTSC and Water Board will review and consider the comments received on this Proposed Plan/Draft RAP before making a final decision for Site 6. The final decision will be documented in a ROD/Final RAP, which will include a responsiveness summary for all comments received on this Proposed Plan/Draft RAP. A public notice will be placed in the San Francisco *Examiner* announcing when the Site 6 ROD/Final RAP will become available to the public in the information repositories listed below.

INFORMATION REPOSITORIES

Two information repositories and the administrative record provide public access to technical reports and other IR Program information that support this Proposed Plan/ Draft RAP.

San Francisco Public Library
Government Publications Section
100 Larkin Street, 5th Floor
San Francisco, California 94102
(415) 570-4500
Library Hours:
Mon, Wed, Fri, Sat 10:00 a.m. - 6:00 p.m.,
Tue & Thu 9:00 a.m. - 8:00 p.m.,
Sun 12:00 p.m. - 5:00 p.m.

Navy BRAC Caretaker Support Office
1 Avenue of the Palms, Suite 161
Treasure Island
San Francisco, California 94130
Call for hours: (415) 743-4729

Navy Administrative Record File
ATTN: Diane Silva, Command Records Manager
NAVFAC Southwest
1220 Pacific Highway
Code EV33, NSDB Building 3519
San Diego, California 92132
(619) 556-1280
diane.silva@navy.mil

Navy administrative record file hours are Mon - Fri 8:00 a.m. to 5:00 p.m. Please contact Ms. Silva to make an appointment. Documents may not be removed from the facility; however, they may be photocopied.

Site 6 documents are available in the information repositories and in the administrative record locations listed above. Other information can be found on the Navy's website at www.bracpmo.navy.mil. Click on the map for BRAC installations, then under California, select "Treasure Island NS" from the list. Site-related documents can also be viewed at DTSC's website at http:/www.envirostor.dtsc.ca.gov/public/. Enter "San Francisco" as the City, scroll down and select "Naval Station Treasure Island/Site 6-Fire Training School" and click on the link "Activities" to view documents.

OPPORTUNITIES FOR COMMUNITY PARTICIPATION

Community involvement is essential to selecting remedial alternatives and we encourage you to provide comments. The 30-day public comment period for the Proposed Plan/Draft RAP is February 28, 2014 through March 31, 2014.

COMMENTS

There are two ways to provide comments during this period:

1. Offer oral comments during the public meeting (March 12, 2014)
2. Provide written comments in person, by mail, e-mail, or fax (no later than March 31, 2014)

Public Meeting **March 12, 2014 — 6:30 p.m. to 8:30 p.m.**
Casa de la Vista, Building 271, Treasure Island, California.

You are invited to this public meeting to discuss the information presented in this Proposed Plan/Draft RAP for Site 6. Navy representatives will provide information on the environmental investigations conducted for Site 6. You will have an opportunity to ask questions and formally comment on the Navy's preferred remedial alternatives for soil and groundwater at Site 6 as presented in this Proposed Plan/Draft RAP. A court recorder will be available to record meeting minutes and public comments.

Submit Comments

You may provide comments on the Proposed Plan/Draft RAP orally at the public meeting or submit your comments in writing at or after the public meeting. You may mail, e-mail, or fax written comments on this Proposed Plan/Draft RAP to Mr. Keith Forman, Navy BRAC Environmental Coordinator, postmarked no later than March 31, 2014. Please see Mr. Forman's full contact information on page 16.

GLOSSARY OF TERMS

Applicable or Relevant and Appropriate Requirements (ARAR): Federal or more stringent state environmental standards, requirements, criteria, or limitations that need to be attained by final remedial actions for a CERCLA site.

Biosparging: An in-place remediation technology that injects air (or oxygen) and nutrients (if needed) into the saturated zone to increase the biological activity of the existing microorganisms and promote biodegradation of organic constituents in the saturated zone.

Bioventing: An in-place remediation technology that enhances the activity of the microorganisms by inducing air flow (or oxygen) and nutrients (if needed) into the unsaturated zone.

Cancer Risk: The probability that an individual will develop cancer over a 70-year lifetime as a direct result of exposure to contaminants.

Chemicals of Concern (COC): Chemicals identified as potentially posing an unacceptable risk through an evaluation called a site-specific, human health, or ecological risk assessment.

Chemicals of Ecological Concern (COEC): Chemicals that may pose an unacceptable site risk to ecological receptors based on their toxicity, mobility, and concentration.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): A federal law that sets up a program to identify hazardous waste sites and establishes procedures for cleaning up sites to protect human health and the environment. The Navy implements its Installation Restoration Program at hazardous waste sites to meet the requirements of CERCLA.

Conceptual Site Model (CSM): A three-dimensional picture of site conditions that illustrates contaminant distributions, release mechanisms, exposure pathways and migration routes, and potential receptors. The CSM is based on interpretation of the site history and past operations, geologic and hydrogeologic information, site environmental investigation data, and human health and ecological risk assessment results.

Covers: Containment actions that isolate contaminated media from humans and the environment (such as soil covers, asphalt and concrete covers, or covers that incorporate impermeable barriers).

Dioxins and furans: Chlorine-containing hydrocarbons that form as by-products of a variety of chemical reactions and combustion processes such as burning. Furans are chemically similar, dioxin-like compounds.

Exposure Pathways: The ways that a living organism may come in contact with a chemical, such as by touching, breathing, or ingesting it.

Groundwater: Water below the ground surface in rock or sediment.

Hazard Index (HI): A calculated value used to represent a potential noncancer health effect. An HI value of 1 or less is considered protective of human health.

Human Health Risk Assessment (HHRA): An analysis of the potential negative impacts to human health caused by exposure to hazardous substances released from a site.

Installation Restoration (IR) Program: The program initiated by the Department of Defense, in compliance with CERCLA (see above), to identify, investigate, assess, characterize, clean up, or control past releases of hazardous substances.

In Situ Bioremediation (ISB): Technologies that consist of treatments through placement or injection of amendments (such as a nutrient substrate) or specialized bacteria in the subsurface to induce or enhance biodegradation of contaminants.

Institutional Controls (IC): Non-engineered mechanisms established to limit human exposure to contaminated waste, soil, or groundwater. These mechanisms may include deed restrictions, covenants, easements, laws, and regulations.

Methylchlorophenoxypropionic Acid (MCPP): A common general-use herbicide.

Monitored Natural Attenuation (MNA): Monitoring and measuring the decrease or attenuation of contaminants in groundwater that occur through natural processes. These processes include biodegradation by bacteria, sorption of contaminants onto soil particles, dilution, and chemical reactions with natural substances.

National Oil and Hazardous Substances Pollution Contingency Plan (NCP): The federal regulatory basis for government responses to oil and hazardous substances spills, releases, and sites where these materials have been released.

Noncancer Hazard: Likelihood or probability that a hazardous substance released to the environment will cause adverse effects on exposed humans or other biological receptors.

Operation and Maintenance (O&M): O&M is a component of the remedial action to ensure that the remedy performs as intended. O&M actions range from maintaining the remedy, such as durable cover, to operating remediation equipment, such as air-sparging and bioventing machinery.

Polychlorinated Biphenyl (PCB): A group of toxic, persistent chemicals used as coolants and lubricants in transformers, capacitors, and other electrical equipment because they do not burn easily and are good insulators. Their use in the U.S. was banned in 1979.

Preliminary Assessment/Site Inspection (PA/SI): The PA is generally the first step in the site evaluation process where historical site data, geology, hydrology, and general environmental information are collected and analyzed to distinguish if further site investigation is needed. The SI is a more detailed site evaluation that uses PA results to plan and collect environmental samples at the sites and surroundings. Data are screened against benchmark and guideline values to determine whether contaminants may pose potential risk to human health and the environment.

Proposed Plan/Draft Remedial Action Plan (Proposed Plan/Draft RAP): A document that reviews the remedial alternatives presented in the FS (see RI/FS below), summarizes the recommended remedial action, explains the reasons for recommending the action, and solicits comments from the community. The RAP is required under HSC Section 25356.1 for sites that are not listed on the NPL, such as Treasure Island. A Draft RAP is the California HSC equivalent of the Proposed Plan.

Receptors: Humans, animals, and plants that may be exposed to site contaminants.

Record of Decision (ROD)/Final RAP: A decision document that identifies the remedial alternatives chosen for implementation at a CERCLA site; the ROD/Final RAP is based on information from the RI/FS (see below) and on public comments and community concerns. A Final RAP is the California HSC equivalent of the ROD.

Remedial Action Objectives (RAO): A description of **remediation goals (RG)** for each medium of concern at a site (for example, soil or groundwater), expressed in terms of the contaminants of concern, target cleanup levels, and exposure pathways and receptors. RGs form the basis for RAOs by providing contaminant-specific concentrations that are protective under a given exposure scenario.

Remedial Design (RD): The RD is the phase in site cleanup where technical specifications for cleanup remedies and technologies are designed.

Remedial Investigation/Feasibility Study (RI/FS): The RI identifies the nature and extent of potential contaminants at a site and assesses human health and environmental risks. The FS is a study that identifies and evaluates remedial technologies for a site based on effectiveness, availability, cost, and other criteria.

Remediation Goals (RG): Remediation goals are media-specific cleanup goals for a selected remedial action. Remediation efforts would be considered complete and no further action would be necessary when the remediation goals have been attained.

Risk: Likelihood or probability that a hazardous substance released to the environment will cause adverse effects on exposed humans or other biological receptors. Risk calculations incorporate very conservative assumptions. Adverse health effects can be classified as carcinogenic (cancer-causing) or noncarcinogenic. Risk from cancer is expressed as a probability such as 1 in 1,000,000 (also expressed as 10^{-6}). This term means that one person in a population of 1,000,000 is more likely to get cancer over his or her lifetime. Noncancer risk is expressed as a Hazard Index (see above).

Risk Management Range: The risk management range, established by EPA, is a guideline for making risk management decisions. The range is considered to represent an excess lifetime cancer risk between 10^{-4} and 10^{-6}.

Saturated Zone: That portion of the soil horizon where all pore spaces are completely filled with groundwater.

Semivolatile Organic Compounds (SVOC): Organic (carbon-containing) compounds that volatilize slowly at standard temperature.

Screening Level Ecological Risk Assessment (SLERA): An assessment of ecological risk based on published screening criteria.

Soil Gas: Air present in soil pore spaces.

Soil Vapor Extraction (SVE): An in-place process for soil remediation where contamination is removed from soil under a vacuum. SVE is suitable for removing a variety of volatile organic compounds that have a high vapor pressure or a low boiling point compared with water.

Total Petroleum Hydrocarbons (TPH): Petroleum hydrocarbons are organic compounds that contain only carbon and hydrogen. TPH refer to mixtures of petroleum-based hydrocarbon constituents such as those found in gasoline, diesel fuel, and motor oil.

Treatment Actions: Actions that reduce the toxicity, mobility, and volume of contaminated media, thereby reducing the chance of exposure to humans and the environment.

Unsaturated Zone: That portion of the soil horizon extending from the ground surface down to the groundwater table.

Volatile Organic Compounds (VOC): Organic chemical compounds that are man-made substances that tend to volatilize or evaporate from soil or water. These chemicals are commonly used as solvents, degreasers, and dry cleaning chemicals.

PROJECT CONTACTS

For more information on the environmental program at NAVSTA TI, the Proposed Plan/Draft RAP or the Notice of Exemption, please contact the following:

Navy Contact
Keith Forman
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Department of the Navy
BRAC Program Management Office West
1455 Frazee Road, Suite 900
San Diego, CA 92108
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(619) 532-0983 (fax)
keith.s.forman@navy.mil

Water Board Contact
Ms. Myriam Zech
1515 Clay Street, Suite 1400
Oakland, CA 94612
(510) 622-2445
myriam.zech@waterboards.ca.gov

DTSC Contact
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700 Heinz Avenue, Suite 200
Berkeley, CA 94710
(510) 540-3840
remedios.sunga@dtsc.ca.gov

EPA Contact
Mr. David Stensby
75 Hawthorne St. SFD-8-3
San Francisco, CA 94105
(415) 972-3246
stensby.david@epa.gov

FORMER NAVAL STATION TREASURE ISLAND
Installation Restoration Site 6
PUBLIC MEETING
March 12, 2014
6:30 – 8:30 p.m.
Casa de la Vista, Building 271
Treasure Island
San Francisco, CA

Proposed Plan / Draft RAP — Comment Form

The public comment period for the Proposed Plan/Draft RAP for Installation Restoration Site 6 at the Former Naval Station Treasure Island, San Francisco, California, is from **February 28 through March 31, 2014**. You may provide oral comments at the public meeting listed above, where all comments will be recorded by a court reporter. Alternatively, you may provide written comments in the space provided below or on your own stationery. All written comments must be postmarked no later than **March 31, 2014**. After you complete your comments and your contact information, please mail this form to the address provided on the reverse side or 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 messages to Mr. Keith Forman at keith.s.forman@navy.mil or fax to (619) 532-0983.

Name: _____

Representing: (optional) _____

Phone Number: (optional) _____

Address: (optional) _____

Please check the appropriate box if you would like to be added to or removed from the Navy's Environmental Mailing List for Treasure Island: ☐ Add me ☐ Remove me

Comments

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Postage

Mr. Keith Forman

BRAC Environmental Coordinator

Navy BRAC Program Management Office West

1455 Frazee Road, Suite 900

San Diego, CA 92108-4310