



Department of the Navy Announces the Proposed Plan for Cleanup of Soil and Groundwater at MCB Camp Pendleton for Operable Unit 5 Sites

November 2006

The Department of the Navy (DON) (including both the Navy and the Marine Corps) invites you to comment on the proposed cleanup plans for contaminated soils and groundwater at Camp Pendleton Sites 1A-1, 6A, 1111, and 12 Area, Site 13. These sites are grouped together and called *Operable Unit 5* or OU 5 (words in *italics* are found in the glossary on page 16). Figure 1 shows the locations of these OU 5 sites on the Base.

The proposed cleanup is part of the DON's *Installation Restoration (IR)* program. The purpose of the IR program is to locate and clean up hazardous waste from former activities at military installations.

This Proposed Plan summarizes the cleanup alternatives evaluated for Sites 1A-1, 1111, and 12 Area, Site 13 and identifies the preferred alternative for each site. Cleanup is not considered necessary at Site 6A because previous investigations determined that the site does not pose a threat to human health or the environment. The OU 5 sites are each described separately in this Plan.

The Plan summarizes information that can be found in greater detail in the *Operable Unit 5 Feasibility Study* and other documents contained in the

Public Comment Period

November 7 to December 8, 2006

You are invited to review the cleanup proposal and send written comments during the comment period above. See page 15 for information on how to submit comments and find additional documents.

Public Meeting

6:30 p.m. Tuesday November 14, 2006

Stuart Mesa Community Center

This meeting is an opportunity for you to hear more about the cleanup proposal, to ask questions, and to give verbal and written comments in person.

Administrative Record for MCB Camp Pendleton. The DON, the United States Environmental Protection Agency (USEPA), and the State of California encourage the public to review these documents to better understand these sites and other IR program activities that have been conducted at MCB Camp Pendleton.

MCB Camp Pendleton (the Base) is in northern San Diego County, California. The Base is bordered on the west by the Pacific Ocean and occupies approximately 125,000 acres of land. Nearly 60,000 personnel train at Camp Pendleton every year, with over 35,000 service members assigned to the Base.

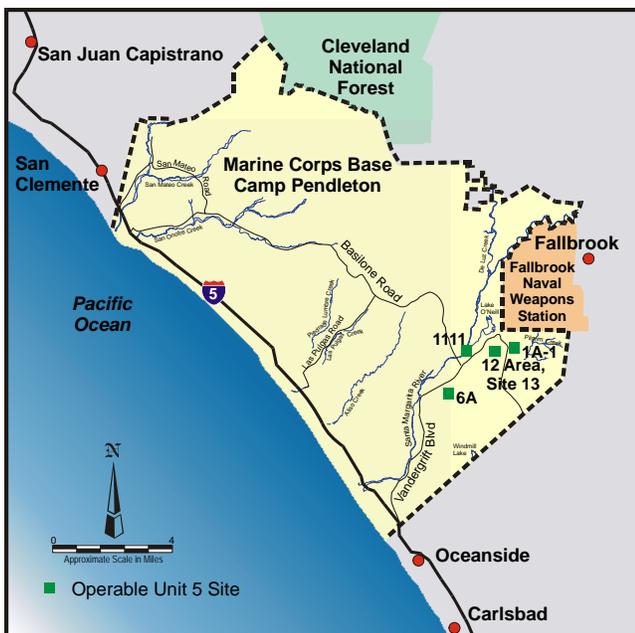


Figure 1: Base Location Map and OU 5 Sites

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INTRODUCTION

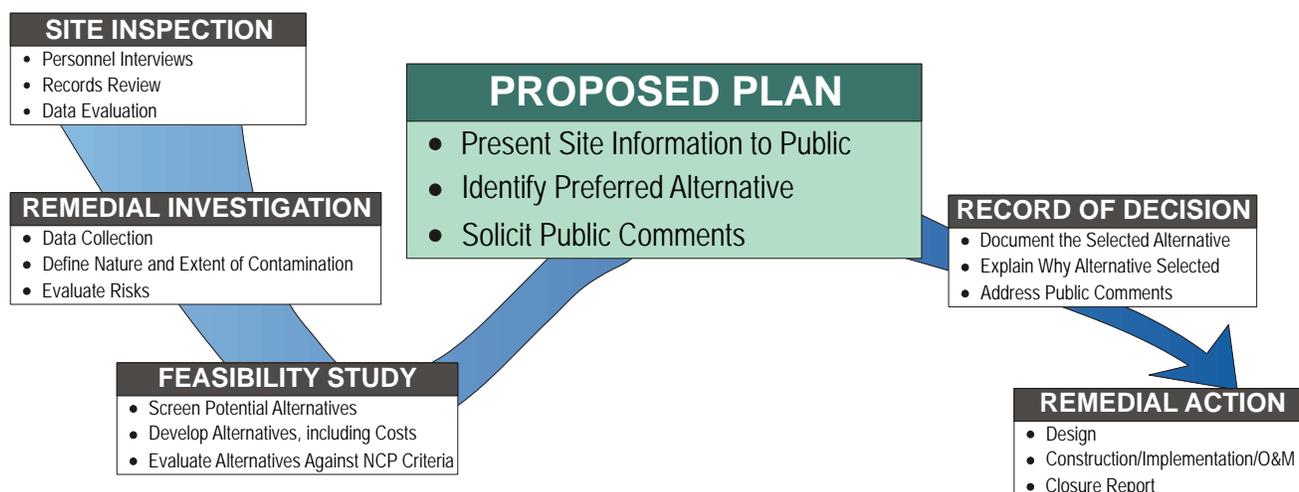


Figure 2: CERCLA Process

THE CERCLA CLEANUP PROCESS

The environmental investigations and cleanup follow the steps shown in Figure 2. These investigations are carried out in accordance with various laws and regulations, including CERCLA (*Comprehensive Environmental Response, Compensation, and Liability Act*), SARA (*Superfund Amendments and Reauthorization Act*), the NCP (*National Contingency Plan*), and Executive Order 12580 (which delegates the implementation of CERCLA to the DON). Steps 1 through 3 were completed for these OU 5 sites.

During step 2, the *Remedial Investigation*, an environmental study was conducted to identify the nature and extent of contamination at the site, and to determine the risk the site poses to human health and the environment. During step 3, the *Feasibility Study*, the results of the risk assessment were evaluated and alternative methods for site cleanup were analyzed. The reports completed during previous steps are available for review in the Administrative Record, at the Base, and at the Oceanside Public Library (see page 15).

The Proposed Plan is step 4 and is based on previous field investigation and reports that were done in the first three steps noted above, including the Remedial Investigation Report for Operable Unit 5 (July 2004) and the Feasibility Study for Operable Unit 5 (September 2005).

After step 4, the DON will review your comments and make a decision regarding the cleanup alternatives. They will then write the *Record of Decision (ROD)*, which is step 5. Any cleanup action is in step 6. Once the sites are clean, a final report is written that describes what was done and the process is over or “closed”.

“RISK ASSESSMENTS” STUDY THE POSSIBLE RISK TO HUMAN HEALTH AND WILDLIFE

The studies completed as part of step 2 at the OU 5 sites included detailed risk assessments to find out if the chemicals could potentially pose a risk to human health or wildlife. A more detailed description of the human and ecological risk assessment process is presented in the following paragraphs.

The *human health risk* assessment examines three levels of negative or adverse health risk: cancer risk, noncancer hazard, and blood-lead level.

First, cancer risk is expressed in terms of the probability that an individual or a particular group of individuals would have an increased chance of contracting cancer over a lifetime period of 70 years. A risk of 1 in a million means that an exposed person could have an increased likelihood of 1 in a million to develop cancer. An increased likelihood of cancer that is higher than 1 in a million may require remedial action.

Second, noncancer health effects are evaluated in terms of a hazard index (HI), which is the ratio of the estimated concentration to which an individual is being exposed to a threshold level concentration that would likely result in negative health effects. If the HI is above 1, then there is a possibility that there might be negative health concerns caused by the site.

Blood-lead levels are the third measure of adverse health effects. Because of unique characteristics of lead, it is not evaluated in the cancer or noncancer methods. A blood-lead level predicted to be greater than 10 micrograms of lead per deciliter of blood indicates unacceptable exposure.

INTRODUCTION

The *ecological risk* is evaluated to determine the potential for negative effects on plants and animals from exposure to site contaminants. Plants and animals are identified that represent the types found at each specific site. Coordination between the Base and regulatory agency staff ensures that any action agrees with the Base's mission and with agency requirements. For example, special-status species ("endangered species") occur near some of the OU 5 sites, and coordination with the US Fish and Wildlife Service would be appropriate to ensure protection of those species during remedial action.

For each plant or animal at a site, ecological hazard estimates, or hazard quotients, were computed. If the hazard quotient is greater than 1, then this indicates that the concentrations may pose an unacceptable risk to a particular plant or animal, and the site may need further evaluation.

Human health and ecological risk were calculated to determine the need for action at these four sites in OU 5. Test results were evaluated to estimate the potential negative effects on human health or plants and animals (ecological receptors) from exposure to chemicals on the sites. The results of the risk assessments are summarized in the sections of this plan for each of the sites.

REMEDIAL ACTION OBJECTIVES

In the Feasibility Study (step 3), potential cleanup alternatives were developed and evaluated. The first step in that process was developing *Remedial Action*

Objectives (RAOs). Site-specific objectives were established to identify and screen alternatives that protect human health and the environment. Remedial action objectives for each site are discussed under each site section.

Remediation Goals (RGs) were developed to meet the objectives for each site. The RGs are the highest concentrations of chemicals that can be left in soil or groundwater and still be protective of human health and the environment. The RGs were established for the chemicals that pose a significant risk to human health or ecological receptors.

CHOOSING A PREFERRED ALTERNATIVE

Following the risk evaluation and cleanup goals for the site, the lead agency develops and analyzes a number of alternative methods to achieve site cleanup, and then chooses a preferred alternative that is considered the best all-around cleanup choice. Each cleanup choice was made based on standards that are spelled out in the NCP. The NCP requires that each alternative be evaluated against each of nine criteria, which are divided into two threshold criteria, five balancing criteria, and two modifying criteria, as shown in Figure 3. The alternative that is selected as the preferred one must meet the two threshold criteria. The five balancing criteria judge how possible and cost-effective the permanent solutions and treatment can be. State and community acceptance are factored into a final determination of the preferred alternative. Community concerns will be addressed following the 30-day public comment period on the Proposed Plan.

----- Threshold Criteria -----



Overall Protection of Human Health and the Environment
Evaluates how the alternative reduces the risk to human health and the environment from potential exposure pathways, using treatment, engineering, or institutional controls.



Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)
Evaluates the ability of each alternative to attain the promulgated federal and state chemical-, action-, and location-specific ARARs.

----- Balancing Criteria -----



Long-Term Effectiveness and Permanence
Evaluates the magnitude of residual risk and the adequacy of controls used to manage the remaining waste over the long term.



Reduction of Toxicity, Mobility, and Volume through Treatment
Evaluates the expected performance of treatment technologies including the amount of waste treated or destroyed and the quantity of chemicals remaining after treatment.



Short-Term Effectiveness
Evaluates the effectiveness to protect human health and the environment during implementation of a remedy; includes protection of the community, workers, and the environment, and time to achieve cleanup goals.



Cost
Estimates capital on operational and maintenance costs.



Implementability
Evaluates the technical and administrative feasibility and availability of necessary goods and services; includes ease and reliability of operations, ability to obtain approvals from other agencies, and availability of equipment and specialists.

----- Modifying Criteria -----



State Acceptance
Indicates the state's preferences or concerns about the alternatives.



Community Acceptance
Indicates the community's preferences or concerns about the alternatives.

SITE 1A-1 – REFUSE BURN MATERIAL

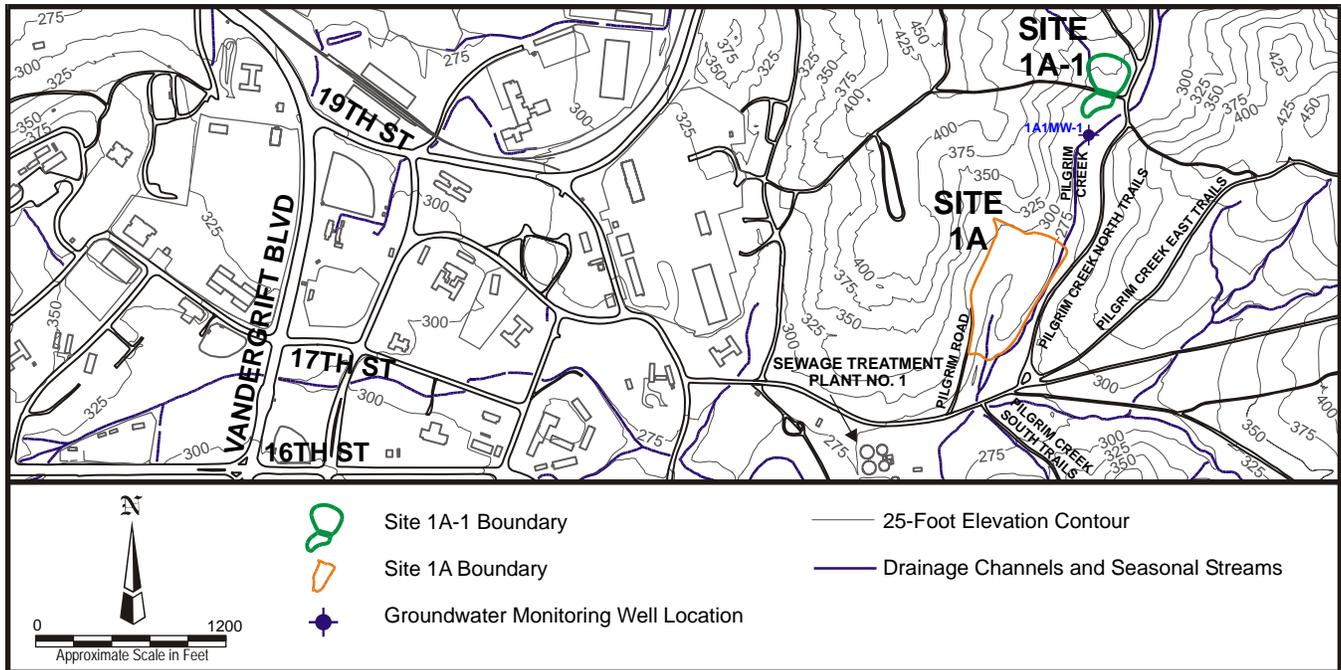


Figure 4: Location of Site 1A-1

SITE 1A-1 - REFUSE BURN MATERIAL

Site 1A-1 is in the 14 Area of the Base, approximately 750 feet north-northeast of Site 1A, which is immediately northeast of Base Sewage Treatment Plant No. 1 (Figure 4). The site is on the west side of a canyon. Site 1A-1 has buried waste and ash that originally came from Site 1A. Pilgrim Creek runs next to the site, which is subject to flooding during heavy rainfall. When Pilgrim Creek floods, it may cause erosion along the edge of the site (Figure 5). From 2003 to 2005, the DON conducted a series of studies at the site, including taking soil and groundwater samples.

Chemicals of concern found in soils include some metals (antimony, arsenic, lead, and zinc), chemicals called *dioxins/furans* that are made during combustion, and the *pesticides DDD, DDE, and DDT*. The estimated volume of contaminated soils is about 20,000 cubic yards, which cover approximately 67,000 square feet up to 10 feet deep.

The risk assessment found that chemicals in soil represent a potential risk to human health and the environment. The estimated cancer risk to human health is greater than the generally accepted human health risk of 1 in a million. Based on the ecological risk assessment for Site 1A-1, four chemicals are present in soil at concentrations that are predicted to pose a significant hazard to specific plants and animals. These chemicals are antimony, lead, zinc, and dioxins/furans.

There were no contaminants found in groundwater, so there is no risk associated with consumption of groundwater. Site 1A-1 is located within the San Luis Rey groundwater basin, which has been designated for beneficial uses for surface water and groundwater. The nearest groundwater production wells are over four miles downgradient from the site in the City of Oceanside.

REMEDIAL ACTION OBJECTIVES

After evaluating site conditions, risks, and legal requirements, remedial action objectives were identified to protect people and the environment. The remedial action objectives are:

- Minimize exposure of people and plants and animals to chemicals in soil that pose a significant risk.
- Protect the uses and water quality of the San Luis Rey River basin.

CLEANUP OPTIONS

Alternatives were considered to lessen or eliminate the risks posed by the site. The DON looked at four possible cleanup options.

- Alternative 1A1-1 No Action
- Alternative 1A1-2 Land Use Controls

SITE 1A-1 – REFUSE BURN MATERIAL

- Alternative 1A1-3 Capping (Engineered Soil Cover), Cap Monitoring/Maintenance, and Land Use Controls
- Alternative 1A1-4 Soil Excavation, Backfill, Pretreatment, and Disposal

EVALUATION OF ALTERNATIVES

Based on the potential risks to people and hazards to animal species, the DON evaluated each alternative against the nine evaluation criteria. Alternatives 1A1-1 through 1A1-4 were compared to the NCP criteria; the advantages and disadvantages of the alternatives compared to each criteria are presented below, and the results are summarized in Table 1.

The estimated cost for each alternative in this Proposed Plan has been refined since the publication of the FS. These refined cost estimates reflect the DON's best estimate to implement each alternative for Site 1A-1, and for each of the other sites described in this Proposed Plan.

Alternative 1A1-1: No Action is required to be evaluated under CERCLA and is included only as a point of comparison. Under this option, nothing is done to clean up the soil contamination, prevent land use, or limit contaminant movement. This alternative does not meet ARARs, protect the environment, or provide long-term effectiveness and permanence. There are no costs for this alternative.

Alternative 1A1-2: Land Use Controls are measures designed to prevent or limit exposure to hazardous substances left in place at a site, or to assure the effectiveness of a chosen remedy. Land Use Controls can be physical barriers such as fences or signs or legally binding requirements to prevent ground disturbance at a site. The alternative includes restrictions on future development and land use, as well as site inspection and monitoring to prevent unauthorized use as long as wastes remain at the site. Alternative 1A1-2 would protect human health through use restrictions but would not protect plants and animals. Land use controls are not considered practical due to the Base's mission of military training. The cost is approximately \$625,000.

Alternative 1A1-3: Capping (Engineered Soil Cover) involves installing a specially constructed soil cover that would limit exposure to the contamination underneath. To ensure that human health is protected, the cap must not be breached through trenching or excavation and must be designed to not be

Criteria	Alternative			
	1A1-1	1A1-2	1A1-3	1A1-4
Threshold Criteria				
Overall Protection of Human Health and the Environment	No	No	Yes	Yes
Compliance with ARARs	No	No	Yes	Yes
Balancing Criteria				
Long-Term Effectiveness and Permanence	○	○	◐ to ●	●
Reduction of Toxicity, Mobility, or Volume by Treatment	○	○	○	◐
Short-Term Effectiveness	NR	●	◐	◐
Implementability	NR	◐	◐	●
Cost (\$ million)	0	0.6	3.1	8.4

○ Low ◐ Moderate ● High NR = Not Rated

Table 1: Summary of Criteria Evaluation for Site 1A-1

damaged by flooding. Therefore, implementability is rated as moderate. This alternative would protect human health and the environment, meet ARARs, and provide moderate to high long-term effectiveness and permanence through elimination of exposure pathways. Alternative 1A1-3 would cost approximately \$3,125,000.

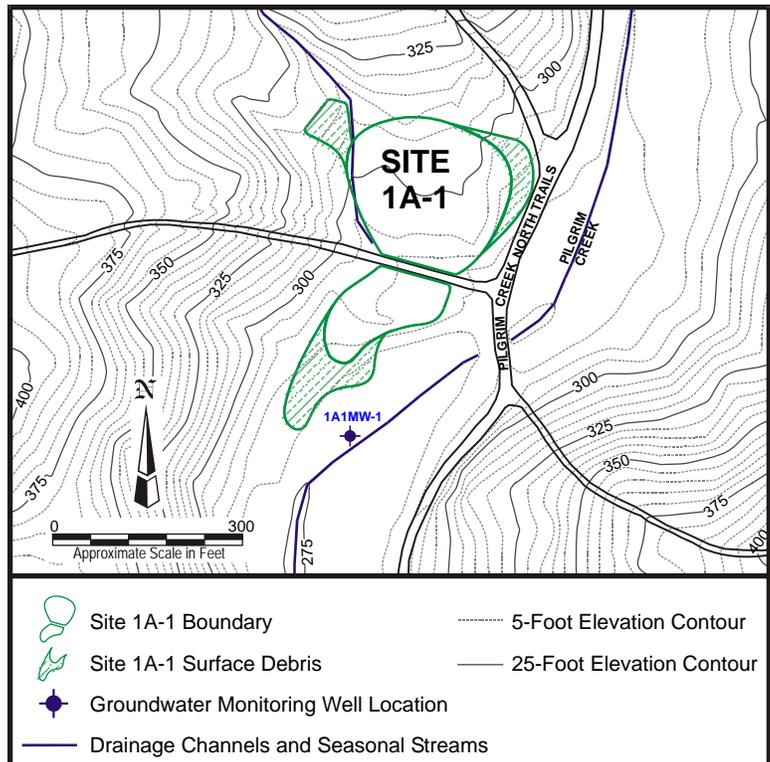


Figure 5: Site 1A-1

Alternative 1A1-4: Soil Excavation, Pretreatment of Excavated Soil, and Off-Base Disposal includes excavating contaminated soil, treating the soil with a chemical stabilizer to make it acceptable for disposal in a landfill, and transporting it to a disposal facility. The estimated volume of soil to be removed and transported is 20,000 cubic yards. Sampling and analysis of excavated areas to make sure they are clean, bringing in clean backfill, and restoring site vegetation are the final stages. Alternative 1A1-4 would protect human health and the environment, meet ARARs, and provide a high degree of long-term effectiveness and permanence. This is the only alternative where toxicity is reduced, the movement of contaminants is stopped, and the soil would be treated prior to disposal. Alternative 1A1-4 would also be the most readily implementable because excavation and disposal is routinely performed at many sites, and there are no complex design or long-term maintenance considerations to carry out this alternative. The overall costs are estimated to be \$8,383,000.

RECOMMENDED CLEANUP ALTERNATIVE

The DON recommends Alternative 1A1-4 (Soil Excavation, Pretreatment of Excavated Soil, and Off-Base Disposal) because it protects both human health and the environment, is cost effective, and can be easily implemented. An evaluation of the NCP criteria is presented below.

Threshold Criteria

Alternative 1A1-4 meets the two threshold criteria. This alternative would protect human health and ecological receptors and complies with ARARs. All contaminated soil exceeding chemical-specific RGs would be removed, treated with Portland cement (or another product) to stabilize, and transported off Base for disposal. The site would then be backfilled with clean imported soil, and the vegetation would be

restored. ARARs would be met by excavating soils exceeding chemical-specific RGs and by coordinating with the US Fish and Wildlife Service (USFWS), State Historic Preservation Officer, and appropriate Native American groups.

Balancing Criteria

Alternative 1A1-4 provides the best balance of tradeoffs with respect to the balancing criteria. This alternative would be effective over the long term and be permanent because contaminants are removed from the site and the contaminated soil is replaced with clean import soil. Although mixing with a stabilizing compound would increase the amount of soil, it would all be treated before moving it off Base and it would be less toxic and less mobile. Potential short-term risks to site workers would be mitigated by protection procedures specified in the health and safety plan. Some short-term impacts to ecological receptors and habitat could occur, but would be lessened by close coordination with the appropriate regulatory agencies (i.e., USFWS). Excavation, pretreatment, and disposal of contaminated soil at an off-Base disposal facility are readily implemented or easy to do. Since most of the impacted soil would be permanently removed from the site, no further actions are expected to be necessary. The cost for Alternative 1A1-4 is estimated at \$8,383,000.

Modifying Criteria

The USEPA and the State of California concur with the preferred alternative. The public is encouraged to participate and provide comments. Details on the public comment period and the public meeting are provided on page 15.

CONCLUSION

In summary, the DON recommends Alternative 1A1-4 because it meets the threshold criteria and represents the best balance of tradeoffs with regard to the balancing criteria.

SITE 6A – DRMO STAGING AREA

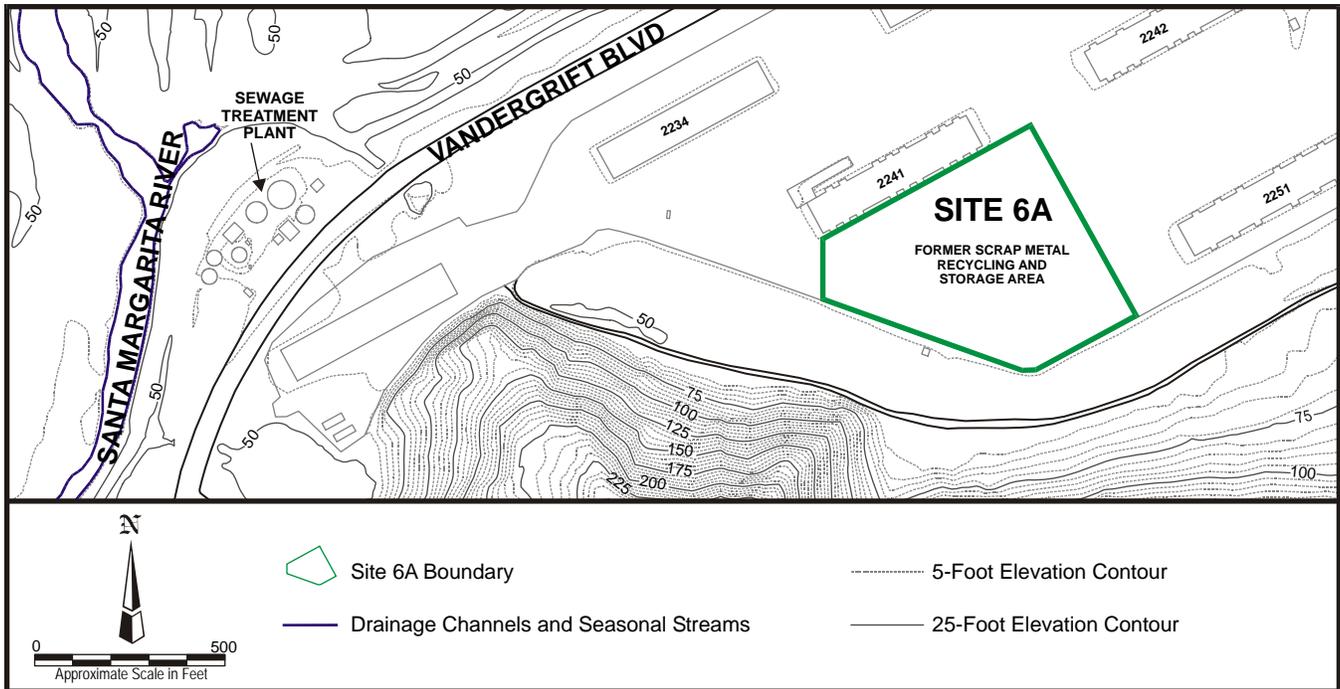


Figure 6: Location of Site 6A

SITE 6A - DRMO STAGING AREA

Site 6A is the Defense Reutilization and Marketing Office (DRMO) property staging area in 22 Area (Figure 6). The site is a paved area where scrap metal was temporarily stored for resale (Figure 7). The site had been covered with a thin layer of soil by periodic flooding, and scraps of metal were reportedly pounded into the ground between 1994 and 1995, causing an uneven ground surface. Prior to repaving the site with approximately three inches of asphalt, a loader was used to repair the uneven ground, further burying pieces of scrap metal.

During excavation of a trench, pockets of scrap metal, plastic, and roof felt were found approximately 8 inches deep, affecting an area of about 96 feet by 4 feet. The site was added to the IR program, and soil sampling was conducted to ensure that no significant contamination was present.

Only relatively minor soil contamination was found. Concentrations of metals detected in soil are generally consistent with background levels. Volatile organic compounds detected were below their respective chemical-specific RGs. Three dioxin/furans compounds were detected in a relatively deep (9 to 10 feet) sample; however, subsequent sampling using

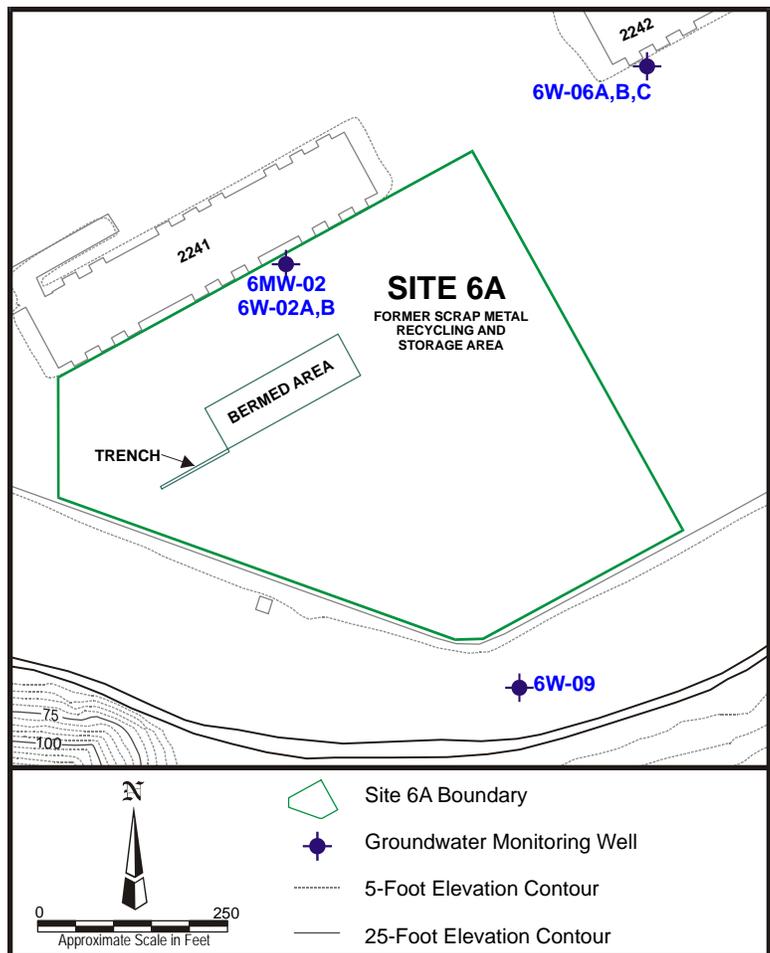


Figure 7: Site 6A

SITE 6A – DRMO STAGING AREA

a more refined method did not confirm the presence of elevated dioxins. The relatively low concentrations of dioxins/furans and the lack of visual evidence of burning suggest that dioxin/furans were not related to previous site activities.

The DON evaluated cancer risks and noncancer hazards from ingestion and contact with soil and inhalation of soil dust. The DON concluded that the cancer risk to a potential resident is greater than 1 in a million. However, most of the risk is due to arsenic, which is found naturally in soils at levels consistent with background concentrations. Because arsenic at the site does not appear to be a result of site contamination, human health risk was recalculated without the contribution from arsenic. Without the contribution from arsenic, there is no significant risk to human health based on USEPA toxicity factors.

Using the California EPA toxicity factors, there is a cancer risk slightly greater than 1 in a million due to the presence of cadmium, which results from the State of California's more conservative toxicity factor for this chemical. However, this risk calculation is considered very conservative because cadmium was detected in only one sample from the site, and was not detected in 29 other samples.

The calculated hazard index for the site is greater than 1, but most of the hazard estimate is due to the presence of metals that are within naturally occurring background concentrations (arsenic and aluminum). The hazard index is less than 1, when excluding the contribution from these metals.

Lead concentrations in soil were shown not to be a risk to human health.

Given all of these factors, and other evidence discussed in the RI, Site 6A does not pose a significant threat to human health.

For the ecological risk assessment, Site 6A is almost entirely paved and is in the midst of a mission-active area of the Base. Given the land-use designation, land-use plans, and the lack of exposure pathways for contact between site-related chemicals and ecological receptors, Site 6A does not include suitable foraging habitat for ecological resources. As there are no complete exposure pathways for ecological receptors, this area did not need to be evaluated further in the ecological risk assessment process.

Lastly, the chemicals in soil are not likely to impact groundwater beneath the site, based on fate-and-transport modeling of site conditions.

CONCLUSION

There is little evidence of contamination at Site 6A. The site is not a significant threat to human health or the environment based on the conservative assumption that a resident would be present. Based on this evidence, further action is not warranted at Site 6A, and no land use controls are required. Consequently, remedial alternatives for Site 6A were not identified or evaluated and the DON recommends No Further Action for Site 6A.

The USEPA and the State of California concur with the no further action decision. The public is encouraged to participate and provide comments. Details on the public comment period and the public meeting are provided on page 15.

SITE 1111 – BURN DEBRIS AND WASTE DISPOSAL AREA

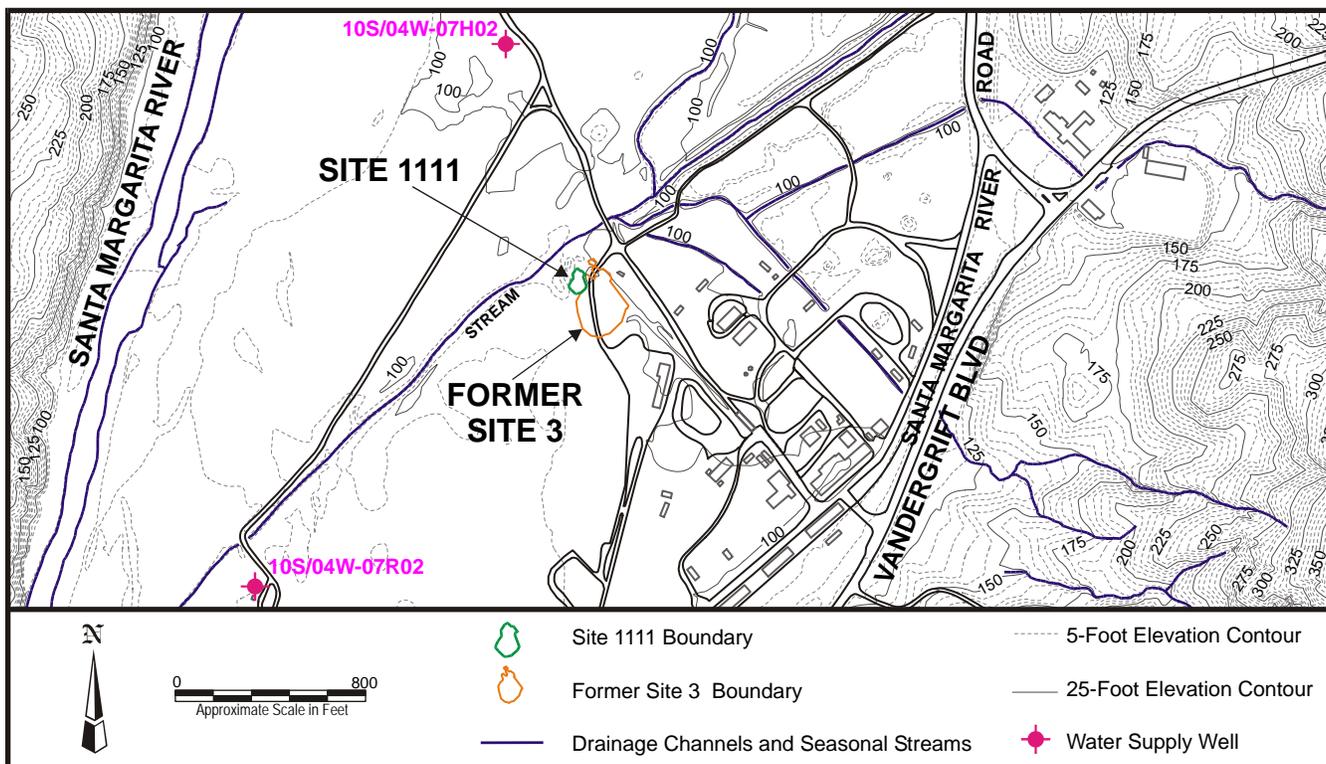


Figure 8: Location of Site 1111

SITE 1111 - BURN DEBRIS AND WASTE DISPOSAL AREA

Site 1111 is in the 26 Area of the Base next to IR Site 3 where equipment used to apply pesticides and herbicides was rinsed. During excavation at Site 3, a layer of ash and burn material was exposed. Excavation continued to a sensitive habitat boundary and down to groundwater, which is at 5 to 6 feet. The area was designated as Site 1111 (Figure 8).

Chemicals found in soils include volatile and semi-volatile organic compounds (VOCs and SVOCs), dioxins/furans, pesticides, and metals (antimony, arsenic, and mercury). The estimated volume of soils is 1,100 cubic yards, which cover approximately 5,000 square feet to a depth of about 5 feet below ground surface.

The risk assessment found that chemicals in soil represent a risk to human health and also pose a significant hazard to specific plants and animals. The estimated cancer risk to human health is greater than the generally accepted human health risk of 1 in a million.

Groundwater beneath the site has been impacted by VOCs. The site information indicates that the continued leaching of contaminants from the waste soils is causing the contamination in groundwater, since there is no documented historical use of the

site other than as a solid waste repository. Although no groundwater production well exists at the site, the risk assessment indicates that there is a potential cancer risk (greater than 1 in a million) if site groundwater were consumed by a future resident. Site 1111 is located in the main aquifer for the South water system, and water supply wells are located near the site (Figure 8). Chemicals in the groundwater include volatile organic compounds and metals.

REMEDIAL ACTION OBJECTIVES

After evaluating site conditions, risks, and legal requirements, remedial action objectives (RAOs) were identified to protect people and the environment. The remedial action objectives are:

- Minimize exposure of people and plants and animals to chemicals in soil that pose a significant risk.
- Protect the uses and water quality of the lower Santa Margarita River basin.

CLEANUP OPTIONS FOR SOIL

Site soil alternatives were addressed in a separate Engineering Evaluation/Cost Analysis (January 2006). The public was invited to review and comment on the soil removal action between 30 January to 28 February 2006. The removal action is

SITE 1111 – BURN DEBRIS AND WASTE DISPOSAL AREA

planned to occur in 2006 and the DON anticipates that this will be the final action for soil. A post-removal action risk assessment will determine if RAOs have been met.

CLEANUP OPTIONS FOR GROUNDWATER

Alternatives were considered to lessen or eliminate the risks posed by contaminants in groundwater at the site. The DON looked at four possible cleanup options.

- Alternative 1111-G1: No Action
- Alternative 1111-G2: Land Use Controls and Long-Term Groundwater Monitoring
- Alternative 1111-G3: Monitored Natural Attenuation with Alternative 1111-G2
- Alternative 1111-G4: Enhanced Attenuation Via Carbon Addition in Source Area with Alternative 1111-G3

EVALUATION OF GROUNDWATER ALTERNATIVES

Based on the potential health risks to people from drinking site groundwater if no action were taken, the DON evaluated each alternative against the nine evaluation criteria. Alternatives 1111-G1 through 1111-G4 were compared to the NCP criteria; the advantages and disadvantages of the alternatives compared to each criteria are presented below, and the results are summarized in Table 2.

Alternative 1111-G1: No Action is required to be evaluated under CERCLA and is included only as a point of comparison. Under this option, nothing is

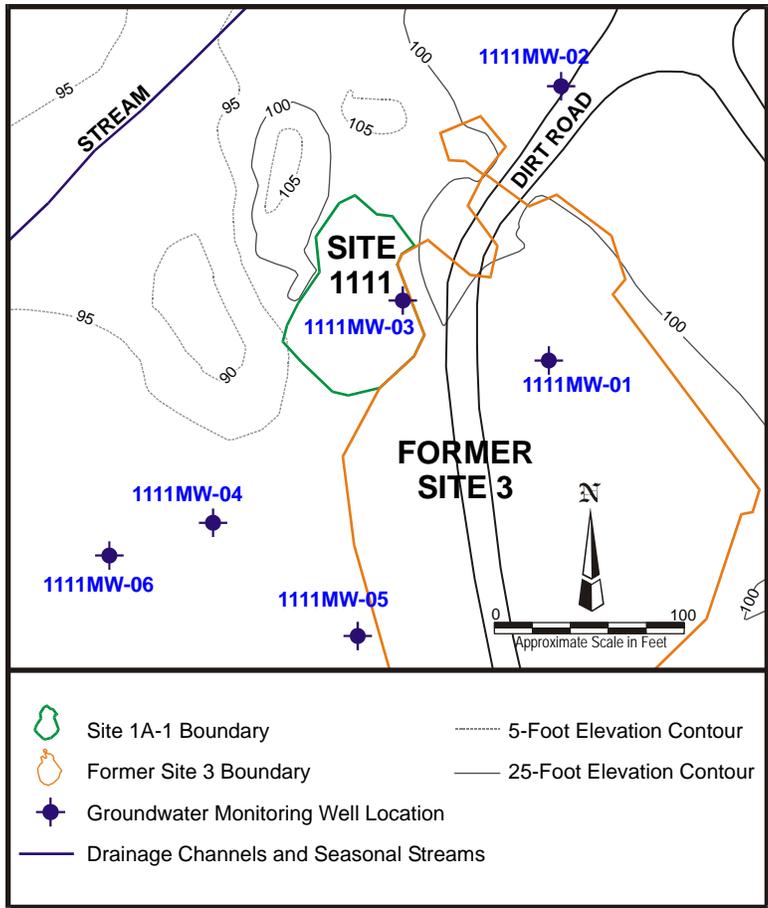


Figure 9: Site 1111

done to clean up the groundwater contamination, prevent land use, or limit contaminant movement. This alternative is not protective of human health; does not meet ARARs; provides little short- or long-term effectiveness and permanence; achieves no reduction in toxicity, mobility, or volume through active treatment; and has no associated cost.

Alternative 1111-G2: Land Use Controls and Long-Term Groundwater Monitoring reduces the risk to human health by enforcing restrictions on the use of site groundwater, and monitoring groundwater to verify that there are no contaminants moving downstream. Figure 9 shows the area of soil to be removed as well as the placement of the monitoring wells. This alternative provides adequate protection of human health and the environment and complies with ARARs. It also provides short-term effectiveness and is easy to implement, but it does not provide active treatment of the groundwater contamination. This alternative provides the monitoring necessary to track plume movement, as well as the necessary restrictions to limit exposure to the site contaminants. Groundwater contaminant levels are estimated to reach RGs (drinking water

Criteria	Alternative			
	1111-G1	1111-G2	1111-G3	1111-G4
Threshold Criteria				
Overall Protection of Human Health and the Environment	No	Yes	Yes	Yes
Compliance with ARARs	No	Yes	Yes	Yes
Balancing Criteria				
Long-Term Effectiveness and Permanence	○	◐	◑	◑ to ●
Reduction of Toxicity, Mobility, or Volume by Treatment	○	◐	◑	◑ to ●
Short-Term Effectiveness	○	◐	◑	◑ to ●
Implementability	NR	●	●	●
Cost (\$ million)	0	0.3	0.4	0.4

○ Low ◐ Moderate ● High NR = Not Rated

Table 2: Summary of Criteria Evaluation for Site 1111 Groundwater

standards) in about 3.5 to 5 years with an estimated cost of \$251,000.

Alternative 1111-G3: Monitored Natural Attenuation with Alternative 1111-G2 involves all of the steps in Alternative 1111-G2, but also includes collecting additional data on how much the contaminants are degrading in groundwater. This additional data would allow for a more direct measurement of the processes that are occurring in the groundwater that are degrading contamination. The alternative protects human health and the environment by enforcing use restrictions and monitoring groundwater to verify there is no contamination moving downstream, and it complies with ARARs. The alternative provides short-term effectiveness and is easy to implement, but it does not provide active treatment of the groundwater contamination. This alternative provides the monitoring necessary to track plume movement, as well as the necessary restrictions to limit exposure to the site contaminants. Groundwater contaminants are estimated to reach RGs (drinking water standards) in about 3.5 to 5 years, and the estimated cost is \$361,000.

Alternative 1111-G4: Enhanced Attenuation Via Carbon Addition in Source Area with Alternative 1111-G3 provides a cost-effective treatment as opposed to the passive options provided by Alternatives 1111-G2 and 1111-G3. The alternative protects human health and the environment by enforcing use restrictions and monitoring groundwater to verify there are no contaminants moving downstream, and it complies with ARARs. The alternative provides short-term effectiveness and is easy to implement. Alternative 1111-G4 provides a higher degree of long-term effectiveness and permanence by reaching RGs sooner; the highest reduction in toxicity, mobility, or volume through treatment; and a somewhat decreased remediation time. This alternative provides the monitoring necessary to track plume movement, as well as the necessary restrictions to limit exposure to the site contaminants. Groundwater contaminants are estimated to reach RGs in about 2.5 to 4 years, and the estimated cost is \$400,000.

RECOMMENDED CLEANUP ALTERNATIVE FOR GROUNDWATER

The DON recommends Alternative 1111-G2 (Land Use Controls and Long-Term Groundwater Monitoring) because it protects both human health and the environment, is cost effective, and can be easily implemented. Following the soil removal action described previously, groundwater will be sampled at the site. Based on those results, and in consultation with the regulatory agencies, additional

measures may be necessary. Therefore, DON is also recommending Alternatives 1111-G3 and 1111-G4 as contingency remedies, if necessary. An evaluation of the NCP criteria is presented below.

Threshold Criteria

Alternative 1111-G2 meets the two threshold criteria. This alternative adequately protects human health and the environment by restricting future use of the contaminated groundwater and effectively eliminating the exposure pathway. Groundwater monitoring allows groundwater quality to be checked and tracks the plume. This alternative does not have any negative environmental or health effects. ARARs can be met because RGs levels could be reached through natural attenuation. Alternative 1111-G2 also complies with federal and state hazardous waste and groundwater protection requirements.

Balancing Criteria

Alternative 1111G-2 provides the best balance of tradeoffs with respect to the balancing criteria. This alternative is effective over the long term because groundwater is monitored to verify there is no off-site migration of contaminants, and it provides restrictions on groundwater use until RGs are met, which limits the potential for human exposure and risks. Alternative 1111-G2 does not include active treatment of the contaminated groundwater; however, natural attenuation is expected to reduce contaminant levels to RGs (drinking water standards). Potential short-term risks to site workers will be mitigated by protection procedures specified in the health and safety plan. Limiting groundwater use and groundwater monitoring is easily implemented. New wells can be installed quickly, and equipment and services are readily available. Land use controls will continue until RGs (drinking water standards) are met at the site. The total cost for Alternative 1111-G2 is approximately \$251,000 to reach RGs.

Modifying Criteria

The USEPA and the State of California concur with the preferred alternative. The public is encouraged to participate and provide comments. Details on the public comment period and the public meeting are provided on page 15.

CONCLUSION

The DON recommends Alternative 1111-G2 because it meets the threshold criteria and represents the best balance of tradeoffs with regard to the balancing criteria. Alternatives 1111-G3 and 1111-G4 are also recommended as contingency remedies, if necessary.

12 AREA, SITE 13 – FORMER MESS HALL AND UST

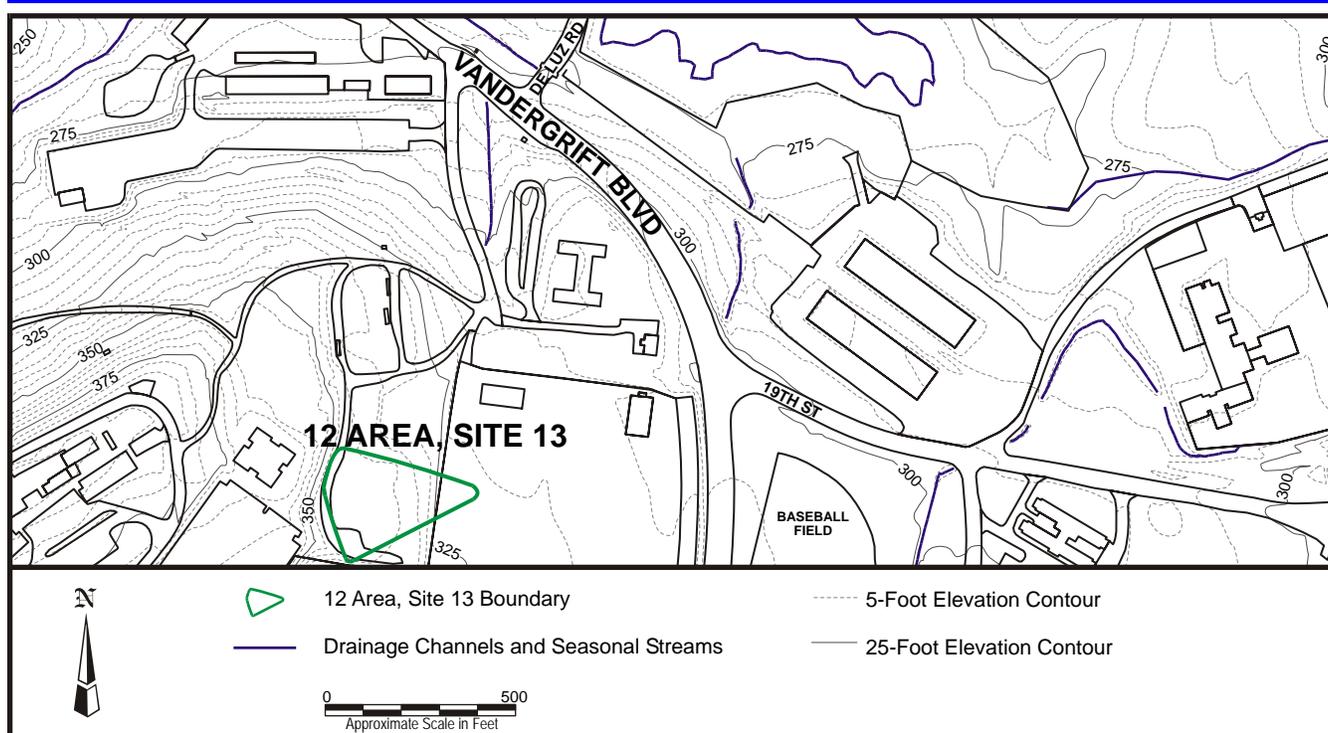


Figure 10: Location of 12 Area, Site 13

12 AREA, SITE 13 - FORMER MESS HALL AND UST

12 Area, Site 13 is in the eastern portion of the Base, approximately 500 feet west-southwest of the intersection of Vandergrift Blvd. and 19th Street (Figure 10). Buildings at the site were demolished in November 1992, and the site is currently undeveloped except for a segment of paved road. Structures included a mess hall, a Quonset hut, and an underground storage tank (UST). The tank, which was removed prior to 1994, was a 1,500-gallon concrete tank used to store diesel fuel for heating.

The DON found no evidence of soil contamination.

Chlorinated compounds were discovered in site groundwater, along with fuel-related compounds and, therefore, the site was moved to the IR program in 2000. Most of the contamination is located at the former UST location. As last measured, there is less than 1 inch of floating fuel in one site monitoring well.

Although no groundwater production well exists at the site, there is a potential cancer risk if site groundwater were consumed. Cumulative cancer risk is greater than 1 in a million and the hazard index is greater than 1. Chemicals of concern in the groundwater are volatile organic compounds, including ethylene dibromide, benzene, and TCE.

The cancer risk to a future indoor worker caused by vapor migrating from the underlying groundwater was determined to be less than 1 in a million using USEPA toxicity factors, and slightly greater than 1 in a million using California EPA toxicity factors. The primary chemical contributing to the vapor inhalation risk is benzene. Because the risk evaluation is conservative, the future risk from vapor migration to indoor air is not considered significant.

The DON evaluated the ecological risk and found that 12 Area, Site 13 is graded and/or covered with invasive weedy vegetation. The site is in a mission-active area of the Base and is not connected with other areas of habitat. Given the land-use designation, land-use plans, and the lack of exposure pathways for contact between chemicals in groundwater and plants and animals, 12 Area, Site 13 does not constitute suitable foraging habitat for ecological resources. As there are no complete exposure pathways, this area did not need to be evaluated further in the ecological risk process.

The groundwater contains chemicals above regulatory thresholds. Based on the potential health risks to humans from the possible consumption of site groundwater, remedial alternatives were considered in the FS.

12 AREA, SITE 13 – FORMER MESS HALL AND UST

REMEDIAL ACTION OBJECTIVES

After evaluating site conditions, risks, and legal requirements, remedial action objectives were identified to protect people and the environment. The remedial goals for each chemical of concern were determined from the risk assessments. The objectives are to:

- Minimize potential exposure of people to contaminated groundwater containing VOCs.
- Protect the beneficial uses and water quality objectives of the lower Santa Margarita River basin.

CLEANUP OPTIONS

Alternatives were considered to lessen or eliminate the risks posed by the site. The DON looked at three possible cleanup options.

- Alternative 12A-1: No Action
- Alternative 12A-2: Land Use Controls, Long-Term Groundwater Monitoring, and Product Removal
- Alternative 12A-3: Monitored Natural Attenuation with Alternative 12A-2

EVALUATION OF GROUNDWATER ALTERNATIVES

Based on the potential health risks to people from drinking site groundwater if no action were taken, the DON evaluated each alternative against the nine evaluation criteria. Each alternative was compared to the NCP criteria; the advantages and disadvantages of the alternatives compared to each criteria are presented below and the results are summarized in Table 3.

Alternative 12A-1: No Action is required to be evaluated under CERCLA and is included only as a point of comparison. Under this option, nothing is done to clean up the groundwater contamination, prevent land use, or limit contaminant movement. This alternative is not protective of human health; does not meet ARARs; provides little short- or long-term effectiveness and permanence; achieves no reduction in toxicity, mobility, or volume through active treatment; and has no associated cost.

Criteria	Alternative		
	12A-1	12A-2	12A-3
Threshold Criteria			
Overall Protection of Human Health and the Environment	No	Yes	Yes
Compliance with ARARs	No	Yes	Yes
Balancing Criteria			
Long-Term Effectiveness and Permanence	○	●	●
Reduction of Toxicity, Mobility, or Volume by Treatment	○	●	●
Short-Term Effectiveness	NR	◐	◐
Implementability	NR	●	●
Cost (\$ million)	0	0.5	0.8

○ Low ◐ Moderate ● High NR = Not Rated

Table 3: Summary of Criteria Evaluation for 12 Area, Site 13

Alternative 12A-2: Land Use Controls, Long-Term Groundwater Monitoring, and Product Removal reduces the risk to human health by restricting use of the site groundwater and monitoring groundwater to verify that there are no contaminants moving downstream. Figure 11 shows the approximate extent of TCE detected in shallow groundwater. Product removal includes inserting a device into a well at the site to remove oily fluids floating on groundwater. Alternative 12A-2 provides adequate protection of human health and the environment and

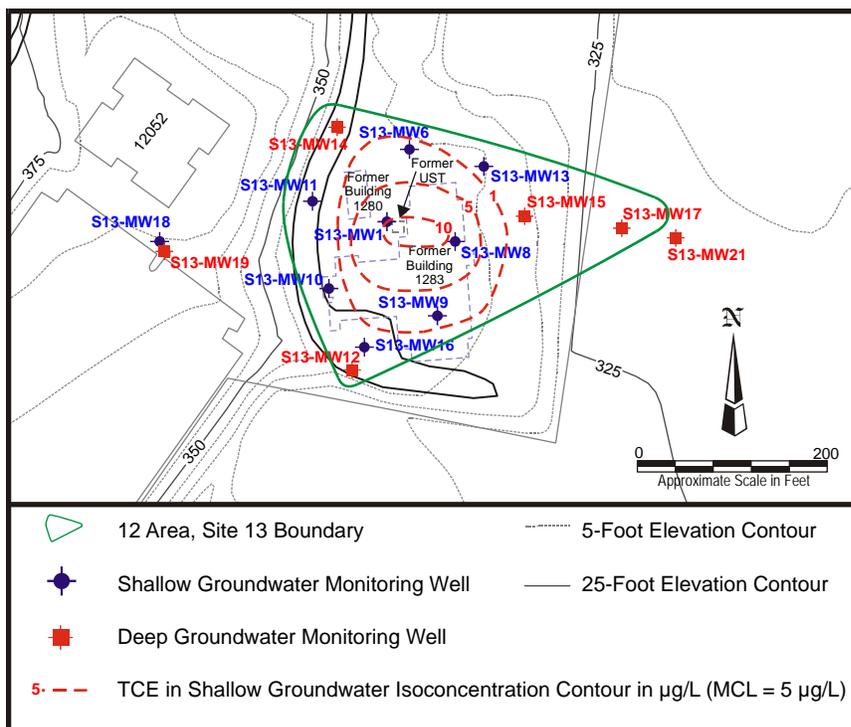


Figure 11: 12 Area, Site 13 - Approximate Extent of TCE in Shallow Groundwater

complies with ARARs. The alternative can be implemented, and is effective and permanent by reaching RGs. Alternative 12A-2 provides the monitoring necessary to track plume movement, as well as the necessary restrictions to limit exposure to the contaminants. The estimated cost is \$544,000.

Alternative 12A-3: Monitored Natural Attenuation with Alternative 12A-2 involves all of the steps in Alternative 12A-2, but also includes collecting additional data on how much the contaminants are degrading in groundwater. These additional data would allow for a more direct measurement of the chemical processes that are occurring in the groundwater that are degrading contamination. Alternative 12A-3 provides adequate protection of human health and the environment and complies with ARARs. This alternative can be easily implemented and is also effective and permanent by reaching RGs. Alternative 12A-3 provides the monitoring necessary to track plume movement, as well as the necessary restrictions to limit exposure to the contaminants. Alternative 12A-3 is the most expensive remedial alternative, with a cost of approximately \$768,000.

RECOMMENDED CLEANUP ALTERNATIVE

The DON recommends Alternative 12A-2 (Land Use Controls, Long-Term Groundwater Monitoring, and Product Removal) because it protects both human health and the environment, is cost effective, and can be easily implemented. An evaluation of the NCP criteria is presented below.

Threshold Criteria

Alternative 12A-2 meets the two threshold criteria. This alternative adequately protects human health and the environment by restricting future use of the impacted groundwater and effectively eliminating the exposure pathway. Removing the contaminants in the groundwater will reduce the time before contaminant concentrations reach RGs. Groundwater monitoring will allow the DON to gauge the groundwater quality and track the plume. This alternative does not have any negative environmental or health impacts. Because the site is in an area where groundwater is not used for drinking water, there will be no negative impact with regard to groundwater usage or water supply for

drinking water. ARARs can be met because RG levels would be reached in groundwater naturally with contaminant removal in the source area. Alternative 12A-2 also complies with federal and state hazardous waste and groundwater protection requirements.

Balancing Criteria

Alternative 12A-2 provides the best balance of tradeoffs with respect to the balancing criteria. This alternative would be effective over the long term and be permanent because contaminants are removed from the site, groundwater is monitored to verify there is no off-site migration of contaminants, and it provides restrictions of future groundwater use. The product removal would reduce the amount of contaminated groundwater requiring clean up and the toxicity of the contaminants in groundwater would be reduced as their concentrations are reduced over time. Short-term effectiveness of the recommended alternative is considered low, because an extended period of time will be needed for the removal of product to reduce the contamination entering the groundwater. Potential short-term risks to site workers would be lessened or eliminated by protection procedures specified in the health and safety plan. Limiting groundwater use and monitoring groundwater can easily be implemented. Chemical recovery is commonly used and can easily be implemented. New wells can be installed quickly; equipment and services are readily available. Land use controls will continue until drinking water standards are met at the site. The total cost for Alternative 12A-2 is approximately \$544,000.

Modifying Criteria

The USEPA and the State of California concur with the preferred alternative. The public is encouraged to participate and provide comments. Details on the public comment period and the public meeting are provided on page 15.

CONCLUSION

In summary, the DON recommends Alternative 12A-2 because it meets the threshold criteria and represents the best balance of tradeoffs with regard to the balancing criteria.

COMMUNITY PARTICIPATION

Public input is important in the decision-making process. Nearby residents and interested parties are encouraged to use the comment period to ask questions about the preferred remedial alternative for each site. The DON will summarize and respond to public comments in a Responsiveness Summary, which will become part of the official Record of Decision.

WHERE YOU CAN FIND THE CLEANUP PLAN AND OTHER DOCUMENTS

Documents relating to the IR program and this Proposed Plan can be found for public review and comment at the following locations:

Administrative Record Naval Facilities Engineering Command Southwest

1220 Pacific Highway
San Diego, CA 92132-5190
(619) 532-3676

MCB Camp Pendleton Environmental Security Office

Building 22165
MCB Camp Pendleton, CA 92055-5008
(760) 725-9744

Oceanside Public Library

330 N Coast Hwy, Oceanside, CA 92054
(760) 435-5600

A copy of the Administrative Record, which contains all of the materials the Base relies on in selecting a cleanup alternative, is also available.

COMMENT PERIOD AND PUBLIC MEETING

The public comment period for this Proposed Plan offers you an opportunity to provide input to the process for controlling contamination and risks at Camp Pendleton. The public comment period will begin on November 7, 2006 and end on December 8, 2006, and a public meeting will be held on Wednesday November 14, 2006 at 6:30 p.m. in the Stuart Mesa Community Center. All interested parties are encouraged to attend the meeting to learn more and ask questions about the alternatives developed for each site and the CERCLA process. The meeting will provide an additional opportunity for

the public to submit comments on this Proposed Plan to the DON.

RECORD OF DECISION

Following the public comment period, the USEPA, the State of California, and the DON will sign a Record of Decision. It will detail the approach chosen for each site and include the DON's responses to comments received during the public comment period.

WHO TO CONTACT FOR MORE INFORMATION

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California Regional Water Quality
Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4353
(858) 467-2728

If you have comments on this Proposed Plan or questions about the IR program, contents, or issues discussed in the Proposed Plan, please contact any of the above.

Administrative Record – All documents that have a legal bearing and were used to make decisions on cleanup actions.

ARAR (Applicable or Relevant and Appropriate Requirement) – This is a federal or state law that must be considered in choosing a remedial action. Remedial actions must be designed, constructed, and operated to comply with all ARARs.

CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act) – This federal law provides a series of programs to address the cleanup of hazardous waste disposal and spill sites. CERCLA required the cleanup, or remediation, of hazardous waste sites created by historical disposal practices. Congress gave the USEPA responsibility for overseeing compliance with this law.

DDD (Dichlorodiphenyldichloroethane) – DDD was used to kill pests, but its use has been banned. DDD enters the environment as a breakdown product of DDT. Exposure to DDD occurs mostly from eating foods containing small amounts of these compounds, particularly meat, fish and poultry.

DDE (Dichlorodiphenyldichloroethene) – DDE enters the environment as a breakdown product of DDT. Exposure to DDE occurs mostly from eating foods containing small amounts of these compounds, particularly meat, fish and poultry.

DDT (Dichlorodiphenyltrichloroethane) – DDT is a pesticide once widely used to control insects in agriculture and insects that carry diseases such as malaria. DDT is a white, crystalline solid with no odor or taste. Its use in the U.S. was banned in 1972 because of damage to wildlife, but is still used in some countries. Exposure to DDT occurs mostly from eating foods containing small amounts of these compounds, particularly meat, fish and poultry.

Dioxins/Furans – A class of chlorinated chemicals that are formed in the combustion process.

Ecological Risk – A qualitative or quantitative estimate of the potential impact on local plants and animals of exposure to chemicals detected in the environment.

FS (Feasibility Study) – A cost and engineering study that looks at all of the possible cleanup options that are available and evaluates their ability to clean up contamination at a site.

Human Health Risk – A qualitative or quantitative estimate of the potential impact on the human population of exposure to chemicals detected in the environment.

IR (Installation Restoration) – The IR program provides guidance and funding for the investigation and remediation of hazardous waste sites caused by disposal activities at military installations.

Land Use Controls – These are measures designed to prevent or limit exposure to hazardous substances left in place at a site, or to assure the effectiveness of a chosen remedy. Land Use Controls can be physical barriers such as fences or signs or legally binding requirements to prevent ground disturbance at a site.

NCP (National Contingency Plan) – The NCP establishes the regulatory requirements for decision documents, such as this Proposed Plan.

OU (Operable Unit) – A group of one or more cleanup sites. Often the sites within the operable unit have similar characteristics, such as contaminants, industrial processes, or location.

RAO (Remedial Action Objective) – Describes what the site cleanup is expected to accomplish.

RG (Remediation Goal) – The acceptable level of a chemical to protect human health and ecological receptors, which is calculated during the human and ecological risk assessments and based on the conditions at a specific site.

RI (Remedial Investigation) – An environmental study that identifies the nature and extent of contamination at a site.

ROD (Record of Decision) – A public document that explains which cleanup alternatives will be used at NPL sites. The ROD is based on information and technical analysis generated during the remedial investigation/feasibility study and consideration of public comments and community concerns.

SARA (Superfund Amendments and Reauthorization Act) – The Superfund Amendments and Reauthorization Act of 1986 reauthorized CERCLA to continue cleanup activities around the country. Several site-specific amendments, definitions clarifications, and technical requirements were added to the legislation, including additional enforcement authorities. Title III of SARA also authorized the Emergency Planning and Community Right-to-Know Act.

TCE (Trichloroethene) – TCE is a nonflammable, colorless, volatile liquid with a sweet odor and a sweet, burning taste. It is used mainly as a solvent to remove grease from metal parts, but it is also an ingredient in adhesives, paint removers, typewriter correction fluids, and spot removers.