

**FINAL
NAVAL AIR STATION ALAMEDA RESTORATION ADVISORY BOARD
MEETING SUMMARY**

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Building 1, Suite 140, Community Conference Center
Alameda Point
Alameda, California

June 7, 2007

The following participants attended the meeting:

Co-Chairs:

George Humphreys	Restoration Advisory Board (RAB) Community Co-chair
Thomas Macchiarella	Base Realignment and Closure (BRAC) Program Management Office (PMO) West, BRAC Environmental Coordinator (BEC), Navy Co-chair

Attendees:

Steven Bachofer	St. Mary's College/Community member
Jim Barse	Community member
Andrew Baughman	BRAC PMO West Remedial Project Manager (RPM)
Doug Biggs	Alameda Point Collaborative (APC) Representative
Kevin Bricknell	Tetra Tech EM Inc. (TtEMI)
Neil Coe	RAB
Tommie Jean Damrel	TtEMI
Alona Davis	Sullivan International Group (Sullivan)
Doug DeLong	BRAC PMO West, Environmental Compliance Manager
Catherine Haran	BRAC PMO West RPM
Joan Konrad	RAB
James Leach	RAB
Dot Lofstrom	California Environmental Protection Agency (Cal/EPA) Department of Toxic Substances Control (DTSC)
Frank Matarrese	Alameda City Council
John McGuire	Shaw Environmental and Infrastructure, Inc. (Shaw)
John Olson	Waste Solutions Group/Community member
Peter Russell	Russell Resources/City of Alameda
Erich Simon	Regional Water Quality Control Board (Water Board)
Dale Smith	RAB/Audubon Society

Jim Sweeney	RAB
Louis Terrazas	U.S. Fish and Wildlife Service (USFWS)
Michael John Torrey	RAB/Housing Authority of the City
Xuan-Mai Tran	U.S. Environmental Protection Agency (EPA)

The meeting agenda is provided in Attachment A.

MEETING SUMMARY

I. Approval of Minutes

Mr. Humphreys called the meeting to order at 6:30 p.m.

Mr. Torrey provided the following comment:

- Page 2 of 11, Approval of Minutes, first correction bullet, "...Baypoint will be changed to Bayport..." will be revised to "...Baypoint should be changed to Bayport."
- Page 4 of 11, second paragraph, second sentence, "...around the play area" will be revised to "...around the College of Alameda playing field."

Ms. Smith provided the following comment:

- Page 5 of 11, second paragraph, thirteenth line, "...contamination is some areas," will be revised to "...contamination in some areas."

Mr. Humphreys provided the following comments:

- Page 4 of 11, first paragraph, third line, "...the school would be located," will be revised to "...the school is located."
- Page 6 of 11, fourth paragraph, lines three and six, the words "inch" and "inches" will be replaced with "feet."

The minutes were approved as amended.

II. Co-Chair Announcements

Mr. Humphreys distributed the list of documents and correspondence received during May 2007. The handout is included as Attachment B-1.

Mr. Macchiarella announced that Ms. Anna-Marie Cook of EPA was unable to attend the June meeting and that Ms. Tran, who works on Site 1, would be representing EPA. He also reminded the RAB that there will be no RAB meeting in July 2007.

Mr. Macchiarella announced that the Navy's new RPM to the Alameda Point Navy BRAC team is Catherine Haran.

III. Operable Unit (OU) 3 Installation Restoration (IR) Site 1, Summary of Responses to RAB Comments on Proposed Plan (PP)

Mr. Bricknell began a presentation on the OU-3 IR Site 1 summary of response to RAB comments on the PP. The handout of the presentation is included as Attachment B-2. A handout of the Navy's responses

to public comments was distributed and is included as Attachment B-3. The presentation included two main topics: (1) a review of the PP preferred alternatives for soil, site-wide radiologically contaminated soil and groundwater; and (2) a summary of the RAB's comments of the PP and responses to the comments.

Mr. Bricknell noted that the PP is the basis for the record of decision (ROD). The PP provided sufficient detail for making decisions to meet remedial action objectives (RAO) and will provide direction for the remedial design (RD). The ROD formally selects the remedy, includes a "responsiveness summary" on the PP, and immediately precedes the RD phase.

OU-3 Site 1 is located in the northwestern portion of Alameda Point and occupies 78 acres. Mr. Bricknell showed a map of Alameda Point with the location of Site 1 (Slide 3); he also showed a map of Site 1 features (Slide 4). Mr. Bricknell also identified the inferred disposal areas, the former burn area, and the former pistol range area on the map.

Site 1 was divided into five areas for soil: Area 1 (including Areas 1A and 1B) through Area 5. These areas were shown on the map on Slide 5. The following preferred alternatives for soil in each area were described:

- Area 1A, the disposal area, 21.9 acres – soil cover, wetlands mitigation plan, and institutional controls (IC);
- Area 1B, the burn area, 3.9 acres – excavation, off-site disposal of soil, backfilling, radiological screening and disposal, material potentially presenting an explosive hazard (MPPEH) sweep, and ICs;
- Area 2, paved areas, 27.9 acres – pavement maintenance and ICs;
- Area 3, wetlands areas, 15.5 acres – tier 2 ecological risk assessment (ERA), relocation of soil that contains contaminants at concentrations that exceed remediation goals, and ICs for 15.5 acres of seasonal wetlands;
- Area 4, former firing range berm, 0.52 acres – MPPEH sweep and radiological screening, removal, screening and off-site disposal of soil; and
- Area 5, shoreline areas, 3.6 acres – confirmation sampling, relocation of soil that contains contaminants at concentrations that exceed remediation goals, and ICs.

The preferred alternative for site-wide radiologically contaminated soils includes a time-critical removal action (TCRA) and a radiological final status survey. The TCRA will include removal and off-site disposal of all soil that exceeds RAOs in all areas (except Area 1A) and removal of the pistol range berm (Area 4). The final radiological status survey is part of remedial action and follows the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM).

Slide 7 showed a map of the volatile organic compound (VOC) plume in groundwater at IR Site 1. The preferred alternative for groundwater includes treatment of the VOC plume, long-term monitoring of metals and VOCs, and ICs. In situ chemical oxidation (ISCO) will be the primary method of treatment for the plume, followed by monitored natural attenuation (MNA) as a secondary treatment. Long-term monitoring of groundwater will ensure permanent reduction of VOCs and associated risks. ICs will restrict well installation or construction to include only those with prior Navy and regulatory agency consent, will protect remedial and monitoring equipment, and will allow future Navy and agency access.

The major issues in the RAB's comments on the PP included the following: waste removal, characterizing the landfill, groundwater contamination, the effectiveness of groundwater treatment technology, the cap design, the golf course, and site closure. Mr. Humphreys asked if the Navy invited Mr. Peter Strauss, the Technical Assistance for Public Participation (TAPP) consultant, to the

presentation. Mr. Macchiarella said the Navy had not, and added that he would provide Mr. Strauss with a courtesy copy of the Responsive Summary when it is complete.

Comment 8 on page C-15 of the RAB comments, shown on Slide 10, concluded that waste must be excavated and removed from the site and that closure will involve problems and questions unless effective action is initiated soon. The Navy provided the following response:

- The Navy and the regulatory agencies (EPA, DTSC, and the Water Board) have reviewed all documents that make up the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) administrative record and have agreed that the Navy's proposed remedy will be protective of human health and the environment.
- The preferred alternative is in accordance with the Feasibility Study (FS) process.
- The Navy will conduct the Remedial Design and Remedial Action phases as expeditiously as possible, in the context of the Federal Facilities Agreement (FFA).

Comment 2 on page C-9 (Slide 10) stated that the Navy may have eliminated from consideration certain holistic approaches by fragmenting its assessment into different areas and media. The Navy responded that all of the areas are combined to form the single IR Site 1, under which the Navy evaluated containment for both soil and groundwater; the approach is consistent with the CERCLA process. In addition, the FS and PP are designed to present sufficient information to make decisions among alternatives.

Comment 6 on page C-11 (Slide 11) stated that wastes have not been adequately characterized. The Navy provided the following responses:

- The Navy followed EPA's specific CERCLA presumptive remedy guidance and policy on military landfill and municipal landfills, including "relying on existing data to the extent possible rather than characterizing landfill contents (limited or no landfill source investigation unless there is information indicating a need to investigate hot spots)."
- Enough information and data have been collected to make an appropriate and effective remedial decision.
- The Navy went beyond the requirements by collecting samples at 307 locations.

Major comment 2 on page C-18 (Slide 11) stated that the extent of waste in the landfill and the proximity to San Francisco Bay should be evaluated before a final ROD is written. The Navy responded that the extent of waste in the waste disposal area is identified and documented in Section 6.8 of the remedial investigation (RI) report. Mr. Baughman added that the Navy will remove soil in Area 1B, the area closest to the bay. Mr. Leach said that the concern is that the Navy did not keep an inventory of wastes disposed of in the landfill and that no data are available to identify the contents. He added that the RAB has spoken to people who used to work in the area, and they say that the landfill should not remain. An inventory of wastes discarded in the landfill would be convincing. Mr. Macchiarella said that the Navy process follows EPA's presumptive remedy guidance for landfills and that this guidance does not include an inventory of the contents. He added that groundwater monitoring is an important component of understanding potential problems with a landfill.

Mr. Humphreys commented that the VOC plume shown on the map (Slide 7) does not indicate that the plume is not spread out along the boundary of the bay, as is shown in the groundwater monitoring reports. He added that the plume is continuously flowing into the bay, contaminating the environment, and the Navy is relying on dilution. Mr. Macchiarella said that the Navy is not relying on dilution and that ISCO is an aggressive treatment. Mr. Humphreys asked how ISCO will treat the plume when it is spread along

the edge of the bay and the contamination is already being diluted. Mr. Macchiarella replied that the Navy must begin the remediation process within 15 months after the ROD is signed. He added that in the past there was an attempt to slow down the process of movement of contamination toward the bay using the funnel and gate system. Mr. Leach commented that most landfills are in remote areas away from large populations and are not in areas of recreational use. He added that this landfill is not at a remote location and there are significant populations in nearby areas. He added that a cover on the landfill is not the same as restoring it. Mr. Leach noted that the community wants the site restored.

Mr. Humphreys asked if the cap was the technology specified in the guidance for landfills. Mr. Bricknell replied that a cap is one technology discussed in the guidance, but the guidance does not specify which technology to use. Mr. Humphreys said the guidelines used to specify 10^{-7} centimeters per second permeability for caps on hazardous waste landfills. Mr. Bricknell replied that the criterion for cap permeability is 10^{-6} centimeters per second for municipal solid waste landfills. If an impermeable cap was placed on top, leachate would not be a problem and the cutoff wall would be effective. Mr. Bricknell said that these issues would be discussed later in the presentation. Slide 12 showed an image of the title page to the landfill guidance document, "*Application of the CERCLA Municipal Landfill Presumptive Remedy to Military Landfills.*"

Specific comment 35 on page C-47 (Slide 13), concerning removal of hot spots in Area 1, asked if drummed waste remain and stated that only after full characterization can the Navy realistically cover the remaining waste. The Navy responded that there has been no evidence to suggest the presence or location of time-delayed pockets of material or drummed wastes, and that EPA's presumptive remedy guidance indicates that characterization is not necessary.

Comment 26 on page C-42 (Slide 14), in regard to trichloroethylene (TCE) in air, stated that the risk assessment should include the latest information such as the 2006 findings by the National Academy of Sciences (NAS). The comment also indicated that California's public health goal (PHG) should be a "to-be-considered" applicable or relevant and appropriate requirement (ARAR). The PHG for TCE in groundwater was changed from 2.3 parts per billion (ppb) to 0.8 ppb. The Navy provided the following responses:

- Groundwater vapor intrusion is a potential concern only if a complete exposure pathway exists.
 - Construction of buildings above the VOC plume is prohibited until goals are met.
 - The VOC plume will be treated using ISCO.
 - Regulatory agencies have concurred.
- Groundwater not likely to be used as a source of drinking water.
- PHGs for TCE are for drinking water and are not applicable or relevant and appropriate or to be considered criteria.

Ms. Smith asked if the RAB had commented on TCE specifically or on VOCs in general.

Mr. Humphreys said he believed it was a general comment that included other VOCs. Mr. Bricknell said that he is presenting only some of the comments from the RAB.

Comment 6, page C-11, and Specific Comment 24, page C-40 (Slide 15) stated that there is high probability that contaminated groundwater has been migrating to the bay. The comment also asked whether contaminant concentrations at inland areas were used in the ERA and suggested that almost all groundwater underlying Area 1 is contaminated with heavy metals and VOCs. The comment concluded that contaminated groundwater and leachate are making their way to the bay. The Navy provided the following responses:

- Chemical concentrations outside the VOC plume and higher chemical concentrations inside the VOC plume were addressed in the ERA.
- Groundwater attenuation analysis and the most recent basewide groundwater monitoring report for spring 2006 do not support the conclusion that contaminated groundwater and leachate are migrating to the bay.
- The attenuation analysis in the FS report (Appendix F3) specifically examines the potential discharge of contaminated groundwater to waters of the bay as the primary pathway for risk to the environment at IR Site 1. Outside the VOC plume area, the attenuation analysis suggests that there is not a significant source of contamination in the Area 1 subsurface wastes that would contribute to groundwater contamination

Mr. Humphreys commented that the VOC plume is depicted tangent to the bay and asked if contamination is entering the bay. Mr. Macchiarella replied that groundwater monitoring will help evaluate migration. Mr. Humphreys said that monitoring would detect diluted concentrations. Mr. Macchiarella said that the Navy wants to clean up the plume so that the contamination will not escape into the bay.

Comment 6 on page C-11 (Slide 16) asked if ISCO would be able to achieve cleanup goals and if there would be release of an oxidative reagent or other contaminants, such as radium and other metals, into the Bay. The Navy responded that ISCO has been used successfully to remediate other plumes similar to this plume at Alameda Point. The Navy also responded that, from experience, there has been no observed off-site migration of oxidative reagents on metals with ISCO.

Comment 8 on page 20 (Slide 16) said that the Navy should not rely on MNA for a major role in the groundwater remedy. The Navy responded that ISCO is the primary treatment and the MNA would be a secondary treatment to reduce residual concentrations of contaminants to below remediation goals. Mr. Bricknell added that the focus of the ISCO is to remove the source of the contamination. Ms. Smith said that the original source was in the landfill and asked if by eliminating the source the Navy will lower the contamination levels in the plume itself. Mr. Bricknell responded that currently no continuous source is discharging into the groundwater, but the plume itself is the source that is being addressed by the RAO. Mr. Baughman added that the Navy will actively treat the plume to remove the contamination. During the RD phase, the Navy and the agencies will consider all of the data available to decide where to place injection points. Ms. Smith asked if Gore-Sorbors will be used to identify where to place wells. Mr. Baughman said that the technology used to make the decisions would be selected during the RD phase.

Comment 9 on page C-33 (Slide 17) stated that project proponents must demonstrate that human or environmental receptors will not be exposed to greater risks during the long natural attenuation process to achieve remedial objectives within a reasonable time frame. The Navy responded that MNA will continue for 3 years and is not a stand-alone treatment; the groundwater alternative relies mostly on ISCO to reduce a significant mass of chemical concentrations.

Specific comment 7 on page C-19 (Slide 17) described the concern that the groundwater remedy may lead to a release of other contaminants and suggested a network of guard wells and sentinel wells should be developed. The Navy responded that groundwater monitoring will be conducted as part of the ISCO treatment and that the remedy includes the addition of new wells to supplement the existing well network. The number of wells and locations will be established during the RD phase.

Comment 4 on page C-31(Slide 17) described the concern that ISCO may release other contaminants, such as metals, that are currently stabilized in the landfill and suggested that oxidants be captured if there

is a release. The Navy responded that the preferred alternative includes effectiveness monitoring during ISCO and MNA. The remedy includes long-term groundwater monitoring, and wells to be sited around the perimeter of the plume.

Comment 7 on page C-14 (Slide 18) stated that the soil cover does not meet the standards for landfills that contain municipal waste. The Navy responded that the soil cover meets all ARARs, including environmental laws and regulations, and closure standards for landfills that contain municipal wastes.

Comment 16 on page C-23 (Slide 18) stated that the cap should include a bio-barrier. The Navy responded that the BRAC Cleanup Team (BCT) agreed during the remedy analysis to increase the thickness of the cap to 4 feet to account for burrowing animals. The remedy includes operations and maintenance (O&M) to help ensure effectiveness.

Comment 17 on page C-24 (Slide 19) said it was unclear whether the Navy has considered the re-use plan for a golf course in the RD. The Navy responded that it takes into account the future re-use of the site and has reviewed EPA's guidance document for reusing cleaned up Superfund sites and installing golf courses.

Comment 20 on page C-25 (Slide 19) asked about responsibility for maintaining the cap once a golf course is in place. The Navy responded that maintenance will be included with other ICs for the remedial actions and the Navy will seek to transfer this responsibility to the future land owner by contract, property transfer agreement, or other means. In any event, the Navy retains ultimate responsibility for the integrity of the remedy.

Comment 30 on page C-45 (Slide 19) stated that surface inspection of the runways, the proposed soil cap, or an engineered cap would not be possible once a golf course is built. The Navy responded that maintenance would occur only to exposed runways. EPA has issued an information document, "*Reusing Cleaned Up Superfund Sites: Golf Facilities Where Waste is Left on Site*," that provides examples of golf courses that were successfully constructed on landfills and that endorses future use of landfills as golf courses. Ms. Konrad asked about Navy plans if reuse is not a golf course. Mr. Macchiarella said there are multiple reuse scenarios that are satisfied in the current remedy and includes residential reuse restrictions. Ms. Konrad said that the city may be considering other uses. Mr. Macchiarella said that there may be certain restrictions in some areas and different restrictions in other areas. Restrictions on disturbing the cap will be in place for the landfill area. No major structures will be built over this area. No significant restrictions as Area 1A are envisioned for the remainder of the site. Mr. Coe asked if the Navy has studied possible compaction of the landfill and cap. Mr. Macchiarella replied that the ROD does not go into detail on this issue because it will be considered during the RD phase. Ms. Konrad asked about the size of Area 1A. Mr. Baughman replied 22 acres. Mr. Humphreys commented that part of the area is along the shoreline park where restrooms may be built. Mr. Macchiarella replied that restrictions probably would not be the same for this area as for the landfill. Ms. Konrad asked about covering the runway area. Mr. Baughman replied that the Navy plans to cover the entire Area 1A. Ms. Smith said there may be contamination under the runway. Mr. Baughman said that the runway is composed of several feet of concrete. Slide 20 showed the title page from the EPA document, "*Reusing Cleaned Up Superfund Sites: Golf Facilities Where Waste is Left on Site*."

Comment 6 on page C-11 (Slide 21) asked about future lowering of cleanup level goals. The Navy responded that CERCLA accounts for the possibility of changes in cleanup level goals in its 5-year review process. The Navy and regulatory agencies will review any newly promulgated standards that are potential ARARs during these reviews.

Comment 18 on page C-24 (Slide 21) suggested that proposed remedies for areas adjacent to the bay should take into consideration a sea level rise of 3 feet in the next 100 years caused by climate change. The Navy responded that the CERCLA process includes a 5-year review and the Navy will assess any information that may have come to light that may call into question the protectiveness of the remedy.

Comment 11 on page C-21 (Slide 21) stated that other chemicals may be mobilized by changing environmental conditions and that the Navy should identify a mechanism for monitoring environmental change. The Navy responded that a basewide groundwater monitoring program has been established and will be updated if necessary to account for ARARs identified in the ROD.

Mr. Macchiarella commented that Navy completed the Marsh Crust ROD more than 5 years ago and the Navy began its first 5-year review on the remedy in 2006. Ms. Smith asked what happens with the remedy after the 5 year review. Mr. Macchiarella replied that the 5-year reviews are ongoing. Ms. Smith asked if the 5-year reviews end after 30 years. Mr. Baughman said that the Navy often uses 30 years to estimate costs but that 5-year reviews do not necessarily end after 30 years. Mr. Macchiarella said that 5-year reviews may continue for a very long time at sites like landfills.

Mr. Humphreys asked if seismic stability was addressed. Mr. Macchiarella said certain ARARs require a seismically stable cover and this need will be addressed by remedial designers during the RD phase. Mr. Humphreys noted that liquefaction could occur; even though the design can account for liquefaction, it is difficult to know whether the structure will actually perform as designed and questioned the ARARs. Mr. Macchiarella said he could provide Mr. Humphreys with a copy of the ARARs tables. He added that the regulatory agencies and their lawyers will all review the ROD and ARARs.

Ms. Konrad asked if the agencies have reviewed the PP and ROD. Mr. Simon replied that the agencies have reviewed the PP and will be issuing comments on the draft ROD soon. Ms. Lofstrom said that the agencies have similar concerns as the RAB, including seismic stability and the effectiveness of the cap. She said that the agencies have met with the Navy and concur that the 4-foot soil cover is protective of human health. DTSC will be involved in the RD phase on the issue of seismic stability. DTSC wants a network of monitoring wells, which is the traditional way of evaluating landfills for the issue of contamination escaping into the Bay, and will discuss with the Navy the number of wells. In addition, DTSC has asked for a 30-day extension on commenting on the ROD. The review of the ROD is not complete, but DTSC, EPA, and the Water Board concurred on the PP. The branch chief of the DTSC signed off on the PP. Ms. Smith commented that DTSC is taking a different approach in Richmond at a site that is not a base. Ms. Lofstrom said she has worked only on landfills on bases.

Mr. Matarrese said that the Alameda Reuse and Redevelopment Agency (ARRA) comments agree with the RAB and support “scoop and haul” of the landfill. He said that there is a concern that groundwater is contaminating the bay. He added that the Navy’s responses to comments are not specific, but are generalized and qualified enough to respond to any comment. Mr. Russell added that more characterization of the landfill is necessary because drums may still be located there. He noted that none of the 307 sample locations was inside the landfill. Mr. Matarrese continued that he would report the Navy’s position to the ARRA and said that the reuse agency would take whatever steps necessary to prevent a capped landfill. It is the Navy’s responsibility to clean up the landfill. The city should not take on the liability. Mr. Macchiarella said that the ARRA submitted comments on the PP and the Navy’s responses are in the draft ROD. Mr. Matarrese responded that the responses are generalized. He added that unknown factors with regard to the landfill make the site a good candidate for removal. No samples have been collected within the landfill because of concerns about its contents. Mr. Macchiarella countered that many analyses have characterized the site and are presented in the RI. Mr. Russell noted that the concern was with characterizing the waste within the landfill. Mr. Leach commented that 80 percent of the samples were at depths of less than 2 feet.

IV. Sites 1, 2 & 32 Removal Action Update

Mr. Baughman began a presentation on the TCRA for IR Sites 1, 2, and 32. The handout of the presentation is included as Attachment B-4. The presentation included the following sections: background, RAOs, TCRA, schedule, on-going activities, and a summary. IR Site 1 is located in the northwestern corner of Alameda Point and was used for waste disposal from 1943 to 1956. IR Site 2 is in the southwestern corner of the base and was a disposal area from 1952 through 1978. IR Site 32 is east of IR Site 1 in the northwestern corner of Alameda Point. It is called the Northwest Ordnance Storage Area and includes Buildings 82 and 594.

The RAOs are to prevent ingestion, dermal contact, or inhalation of radioactive contamination above background concentrations and to assure that the dose received from potential pathways from the radium-contaminated waste to a member of the public in the accessible environment does not exceed 15 millirems per year (mrem/yr). The TCRA addresses radium-226 and MPPEH. Currently, surface radium-226 contamination at Site 1 is being removed (except Area 1A) as stated in Alternative 6-4 of the final FS report. While no evidence of subsurface contamination exists, any elevated levels that are found during the removal will also be removed. This removal action addresses data from the radiological survey completed in November 2006. Mobilization occurred in late February 2007, and the removal action began in March 2007. Excavation is scheduled to finish in July or August 2007, and demobilization will occur thereafter. Slide 7 showed a map of IR Sites 1 and 32, and Slide 8 showed a site detail map of IR Site 2. Mr. Baughman noted that many of the pink clusters on the maps are gravel and riprap because those rocks contain naturally occurring radionuclides. He also identified the location of the former radiological shack on the Site 2 map.

TCRA activities include mobilization, vegetation clearance, a topographic survey, an MPPEH survey, excavation, and site restoration and demobilization. Vegetation was cleared from work areas at Sites 1, 2, and 32 and in the area of MPPEH storage magazines. A site biologist was on call in case birds or nests were noticed. A few nesting geese were discovered at Site 1; the area was coned off and a site biologist was contacted. The topographic survey establishes horizontal and vertical controls, provides high and low point elevations, and provides limits of excavation. A geophysical survey was then performed over the known and suspect areas, such as debris pit and disposal trenches where MPPEH. The survey located potential buried sources and obstructions and is used to provide maximum protection for site workers against exposure to potential hazards during excavation. Ms. Smith asked about the depth below the surface the objects can be detected. Mr. Baughman replied that he was not sure. Mr. Russell said it depends on the size of the object. Ms. Smith asked if that means a bigger object buried farther down might be detected while a smaller piece at that same depth may not be detected. Mr. Russell said that the statement was correct.

As of May 25, 2007, 4,869 cubic yards (cy) of soil have been excavated and 4,500 cy processed through the Trommel screening plant. Slide 13 showed photographs of the excavation. A scanning pad was constructed of asphalt and equipped with berms for secondary containment to prevent wastewater runoff and runoff. The scanning pad allows staging of material for the initial MPPEH and radiological survey and segregation. After excavated soil is scanned on the asphalt pad, the soil is processed through the on-site Trommel-type screening plant. Slides 14 and 15 showed photographs of soil screening. Slide 16 showed a diagram of the Trommel screen plant. Mr. Torrey asked if the soil is being disposed of at Alameda Point. Mr. Baughman said the soil would be disposed of off site. Mr. Torrey asked if the rock is contaminated. Mr. Baughman said that all large pieces of rock are hand-screened individually and a swipe sample is sent to a laboratory. In this case, wood is assumed to be radiologically contaminated. Mr. Torrey asked about the type of contamination that is being investigated. Mr. Baughman said this investigation involves only radiological contamination.

The berm was removed in 6-inch lifts using armored earthmoving machinery after initial screening of the lift for MPPEH and radioactive anomalies, and those anomalies removed. Excavated soil was transported and laid out in a 6-inch layer on the asphalt pad to conduct a second MPPEH and radiological survey. Slides 17 and 18 showed photographs of the former firing range berm. Excavated soil and debris from the former firing range berm was processed through a Trommel screening plant, where the soil was segregated by size. The soil that passed through the screen is stored in stockpiles for chemical and radiological characterization for off-site disposal, and a third radiological survey. Slide 19 showed a photograph of excavation and Slide 20 showed a photograph of the firing range berm after excavation.

Historical accounts indicated large volumes of MPPEH were scattered in the debris pits area. Abundant MPPEH were exposed at the ground surface after storm and high tide events. Slide 21 showed MPPEH located within the debris pit excavation before it was screened on the asphalt pad. Approximately 22,575 MPPEH debris items have been recovered as of May 25, 2007. All items are 20-millimeter (mm) rounds. In addition, 811 are classified as 3X, meaning it is uncertain if the item is live and must be treated as live. The remaining items are classified as 5X, meaning that they are not explosive. Mr. Torrey asked if the Navy found traces of gun powder. Mr. Baughman said most of the MPPEH were practice rounds and were not highly explosive. Slides 23 and 24 showed photographs of 20-mm rounds.

Radiological material and potentially radiologically contaminated material are being removed. To date, 3.2 cy of soil has been excavated from the immediately adjacent 1- to 2-foot radius surrounding radioactive anomalies that have been collected. Twelve radioactive point sources are being stored in a 55-gallon drum. To date, 27 cubic yards of potential radioactively contaminated soil have been removed from "general area" locations that were greater than the investigation level of 3-Sigma above background and are pending analysis, but after radiochemistry the drums are expected to be classified as non-radiologically impacted. Slide 26 showed a table of the current point source inventory. Mr. Baughman noted that the radium was historically shipped in small glass vials and said that broken vials have been found. Mr. Torrey asked if the empty glass vials are contaminated. Mr. Baughman said that they are contaminated, but no radium was left in the vials only residual activity. Slides 27 and 29 showed photographs of recovered point sources.

Slide 29 showed photographs of radiological clearance of personnel and equipment after they exited the exclusion zone. Mr. Baughman described some of the personal protective equipment (PPE) required and the activities performed to ensure personnel safety. Mr. Humphreys asked if a respirator is required for dust. Mr. Baughman replied that the dust in the air is monitored but respirators are not required and that work is stopped during wind greater than 25 mph. Mr. Torrey asked if long-sleeve shirts are required. Mr. Baughman said they are not, and added that the radiological clearance when personnel leave the exclusion zone makes certain personnel have not been contaminated.

The boundaries of the disposal trench are based on the location for the trench sited in the 1983 initial assessment study (IAS). Radioactive material was allegedly disposed of in an unlined trench 50 feet long, 8 feet deep, and approximately 11 feet wide, north of the rifle range and 50 feet north of the aboveground water outlet. The disposal trench will be investigated and excavated in early June 2007 and work is currently under way at the debris pit. The majority of MPPEH recovered from the site is from the debris pit. Slide 31 showed a map of the disposal trench and debris pit at Site 1. The disposal trench will be investigated and excavated in 6-inch lifts. Before excavation begins, the surface will be surveyed for radiological materials and metals. Approximately 96 cy of loose materials are anticipated to be excavated from the disposal trench if the excavation is limited to 4 feet in depth; however, 196 cy of material would be anticipated if the excavation is carried down to 8 feet in depth.

The total volume of soils to be excavated is expected to be between 5,000 to 5,500 cy. Waste classified as hazardous will be transported off site to Kettleman Hills. Nonhazardous waste will be transported to a Class II landfill. Low-level radioactive waste (LLRW) and mixed waste will be managed by the Radioactive Affairs Support Office (RASO) and the U.S. Army Corp of Engineers, which is the Department of Defense Executive Agency for LLRW disposal. MPPEH will be de-militarized and recycled.

Site restoration includes restoring the footprint of the temporary stockpile area to pre-construction conditions and using the released concrete along the former firing berm. Demobilization includes removing temporary facilities from the site and restoring the support zone areas; in addition, construction equipment will be decontaminated. The final action memorandum was completed on January 31, 2007. The final TCRA Work Plan was completed March 2, 2007. Mobilization began in late February 2007, and demobilization will begin by the end of July 2007.

Mr. Biggs asked if revegetation would be part of restoration. Mr. Baughman said that revegetation is included in some areas. Mr. Biggs asked where the Navy would obtain the vegetation. Mr. Baughman said he did not know. Ms. Smith asked if the Navy would use native vegetation. Mr. Baughman said he was not sure. Ms. Smith said there is concern if fast-growing vegetation is used and that restoration of Site 2 would be impossible if invasive species were used. Ms. Lofstrom said it seems unlikely that invasive species would be used. Ms. Smith said ice plant is used extensively to quickly revegetate areas and it is universally considered invasive. Mr. Baughman said that it is unlikely that invasive species would be used, but those details have not yet been determined. Ms. Smith said that she was provided a plant list, but some of the native plants listed are not native to this area. Ms. Lofstrom noted that USFWS would have a role in revegetation of the site.

Mr. Olson commented that his calculation for the removal of material to Kettleman Hills would require 300 trailer loads and 120,000 truck miles. He noted that the company he represents could complete the work with 12,000 truck miles and one railroad train. The reduction in greenhouse gas and fuel use would be substantial.

Mr. Coe asked about the status of the rock piling to seal off contamination to the bay that was planned near the beach area between Sites 1 and 2. Mr. Macchiarella said that area would be evaluated in an upcoming site inspection document. Mr. Coe said that leaching could contaminate the beach at this area. Mr. Macchiarella said that he may be referring to the Site 1 VOC plume, and a remedy is being selected to clean it up.

Mr. Torrey complimented the Navy on its use of good photographs in the presentation. Mr. Bachofer asked how the waste that will be sent to Kettleman Hills is classified. Mr. Baughman replied that most likely lead would be the main type of contamination. Mr. Terrazas asked about the threshold wind-speed limit at which site work is shut down. Mr. Baughman said he was not certain but could obtain the information.

V. BCT Activities

Ms. Lofstrom reported that the BCT did not meet in May 2007 but held informal discussions. She noted much discussion between the agencies and the Navy occurs behind the scenes. When a project is at the draft phase, the agencies present their concerns to the Navy, and these differences are resolved in meetings before the RAB sees the finished document presented in the RAB meetings. One of the issues discussed in May was the Site 2 FS. The agencies submitted many comments on the draft and when the draft final was received there were extensive revisions and several issues are still being debated. The cover is one of the issues. The Site 28 ROD was also discussed. The agencies agree with the Site 28 ROD for the most part. The Navy focused on the potential of copper migrating to the bay, while the

agencies were concerned with copper and arsenic migrating to the bay. This ROD is proceeding smoothly. For the OU-1 ROD, the agencies agreed with the remedy that the Navy has selected, but there is some debate about how the remedy is presented. Ms. Lofstrom noted that once a document is produced the agencies and Navy are in concurrence.

VI. Community and RAB Comment Period

Mr. Biggs said that the Alameda Point Collaborative has developed an organic plant nursery and there is a unique opportunity to revegetate this area using native plants that are grown on site. He encouraged the Navy to use site-grown plants. Mr. Torrey asked about the origin of the soil for the nursery. Mr. Biggs said the soil comes from Sonoma. Ms. Smith asked if the land is on Marsh Crust and if plants are being grown in pots. Mr. Biggs said the land is over the Marsh Crust and pots and raised beds are used. Ms. Smith asked if the native plants have come from Alameda Point. Mr. Biggs said they have not because the Navy owns the land. Ms. Smith noted the island would be a good place to harvest seeds.

Mr. Humphreys said that in May Ms. Smith brought up a question about duct work at Building 5. Mr. Humphreys then read a passage from the book, "*The Radioactive Boy Scout.*" He pointed out that it is possible that the ducts were contaminated with radioactive paint in the two rooms in Building 5 where paint was being handled and said these ducts should be surveyed. Mr. Baughman said that Ms. Haran is now leading the project. The Navy will follow up on the historical radiological assessment (HRA) by surveying buildings and areas with a history of radioactive materials use. The potentially impacted ducts in Building 5 will be surveyed. Mr. Humphreys said that he had thought that Ms. Smith's previous comment was not addressed. Mr. Macchiarella said that evaluating the handful of areas identified in the HRA is the next step after the HRA.

Mr. Matarrese referred to the comment by Mr. Olson about the number of trailers needed to haul material off the island. He asked if the Navy would follow up on how waste is being handled in the most cost-effective, efficient, and environmentally friendly way. Mr. Macchiarella said that the Navy has a list of contractors it uses for these environmental projects. Mr. Matarrese asked if the Navy could ask its contractors to do the work in a more cost-effective, efficient, and environmentally friendly way. Mr. Macchiarella noted that this work is already ongoing. Mr. Matarrese said that there will be more work in the future and asked if these issues will be considered. Mr. Macchiarella said it is possible. Mr. Humphreys noted that there may be some issues with security on the railroad because of the type of waste being transported. Mr. Matarrese said that he did not intend to find a solution to this waste hauling issue at this meeting, but would like to know if these issues will be explored. Mr. Macchiarella said that many alternatives are evaluated in the FS, some with more transportation needs than others. Mr. Matarrese said that institutions may be reluctant to consider new ways of doing things and he is asking the Navy to consider new ways of hauling waste. Mr. Macchiarella said the Navy would consider his suggestion. Ms. Smith said that the FS does not evaluate how the alternatives affect the environment. The FS does not consider waste reduction or greenhouse gases. Mr. Macchiarella replied that the statement is true and the evaluations are not part of the CERCLA process. He added that he is personally interested in researching the amount of energy in some remedies and the associated environmental cost. In some cases, the amount of material being hauled in and out of the site is considered with regard to "implementability" and "short-term effectiveness" of alternatives.

The meeting adjourned at 8:20 p.m.

ATTACHMENT A

**NAVAL AIR STATION ALAMEDA
RESTORATION ADVISORY BOARD MEETING AGENDA
June 7, 2007**

(One Page)

RESTORATION ADVISORY BOARD

NAVAL AIR STATION, ALAMEDA

AGENDA

JUNE 7, 2007, 6:30 PM

ALAMEDA POINT – BUILDING 1 – SUITE 140

COMMUNITY CONFERENCE ROOM

(FROM PARKING LOT ON W MIDWAY AVE, ENTER THROUGH MIDDLE WING)

<u>TIME</u>	<u>SUBJECT</u>	<u>PRESENTER</u>
6:30 - 6:45	Approval of Minutes	Mr. George Humphreys
6:45 - 7:00	Co-Chair Announcements	Co-Chairs
7:00 – 7:30	Summary of Response to RAB comments on Site 1 Proposed Plan	Mr. Kevin Bricknell
7:30 – 8:00	Sites 1, 2 & 32 Removal Action Update	Mr. Andrew Baughman
8:00 – 8:10	BCT Activities	Ms. Dot Lofstrom
8:10 – 8:30	Community & RAB Comment Period	Community & RAB
8:30	RAB Meeting Adjournment	

ATTACHMENT B

NAVAL AIR STATION ALAMEDA RESTORATION ADVISORY BOARD MEETING HANDOUT MATERIALS

- B-1 List of Reports and Correspondence Received during May 2007, distributed by George Humphreys, RAB Community Co-Chair (1 page)
- B-2 Presentation on the OU-3 IR Site 1 Summary of Responses to RAB Comments on the PP, presented by Kevin Bricknell, Tetra Tech EMI (12 pages)
- B-3 Response to Community Comments on the Final PP for IR Site 1, distributed by Andrew Baughman, BRAC PMO West (53 pages)
- B-4 Presentation on IR Sites 1, 2, and 32 TCRA Update, presented by Andrew Baughman, BRAC PMO West (18 pages)

ATTACHMENT B-1

LIST OF REPORTS AND CORRESPONDENCE RECEIVED MAY 2007

(One Page)

Restoration Advisory Board
Reports and Correspondence
Received during May 2007

Documents

1. April 26, 2007, "Draft Final Workplan, Data Gap Sampling Investigation Installation Restoration Site 14, Alameda Point, Alameda, California", prepared by Innovative Technical Solutions, for BRAC Program Management Office West.
2. May 1, 2007, "Quarterly Technical Memorandum for CAA 4C and Final ISCO Work Plan Addendum, Alameda Point, Alameda, California", prepared by Shaw Environmental, Inc., for BRAC Program Management Office West.
3. May 4, 2007, "Final Work Plan for Supplemental Remedial Investigation Sampling at Operable Unit 2C, Alameda Point, Alameda, California," prepared by Bechtel Environmental, Inc., for BRAC Program Management Office West.
4. May 4, 2007, "Signature Page, Volume I of V, Final Remedial Investigation /Feasibility Study Report, IR Site 35, Areas of Concern in Transfer Parcel EDC-5, Alameda Point, Alameda, California", prepared by Bechtel Environmental, Inc. for BRAC Program Management Office West.
5. May 9, 2007, "Final Project Plans, Petroleum Corrective Action Areas 3A, 3B, 3C, 5B West, C and 13 East, Alameda Point, Alameda, California", prepared by Shaw Environmental, Inc., for BRAC Program Management Office West.
6. May 11, 2007, "Final, Pre-Design Work Plan for Operable Unit 5/IR-02", prepared by Tetra Tech EC, Inc., for BRAC Program Management Office West.
7. May 29, 2007, "Draft Project Work Plan Installation Restoration Sites 5 and 10, (Buildings 5 and 400) Storm Drain and Sewer Line, Time-Critical Removal Action, Former Naval Air Station, Alameda, Alameda Point, Alameda, California", prepared by Tetra Tech EC, Inc. for BRAC Program Management Office West.

Correspondence

1. April 27, 2007 (received May 4, 2007), "Review of the Draft Revision 1, Remedial Investigation Report IR Site 20 (Oakland Inner Harbor) and IR Site 24 (Pier Area), Alameda Point, California, February 2007", from Xuan-Mai Tran, U. S. Environmental Protection Agency, Region IX, to Mr. Thomas Macchiarella, BRAC Program Management Office West.
2. May 1, 2007, "Quarterly Technical Memorandum for CAA 4C and Final ISCO Work Plan Addendum, Alameda Point, Alameda, California", from Mr. Thomas L. Macchiarella, BRAC Program Management Office West to Mr. Erich Simon, Regional Water Quality Control Board.
3. May 8, 2007, "Review of the Draft Site Inspection Report for Western Bayside and Breakwater Beach, Alameda Point, Alameda, California, March 2007", from Xuan-Mai Tran, U. S. EPA, Region IX, to Mr. Thomas Macchiarella, BRAC Program Management Office West.

ATTACHMENT B-2

OU-3 IR SITE 1 SUMMARY OF RESPONSES TO RAB COMMENTS ON THE PP

(12 Pages)



WELCOME

**BRAC
PMO**

**Operable Unit 3
Installation Restoration Site 1
1943-1956 Disposal Area
Summary of Responses to Restoration Advisory Board
Comments on Proposed Plan
Alameda Point, Alameda**

Kevin Bricknell, P.E., Q.E.P.
Tetra Tech EM Inc.

June 7, 2007



OVERVIEW

**BRAC
PMO**

- 1. Review of Proposed Plan Preferred Alternatives (Basis of Record of Decision)**
 - Soil
 - Site-wide radiologically-impacted soil
 - Groundwater
- 2. Summary of RAB's Comments and Responses**



Basis of Record of Decision (ROD)

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

- **Proposed Plan**
 - Sufficient detail for making decisions to meet remedial action objectives
 - Basis for Record of Decision
 - Provides direction for remedial design
- **Record of Decision**
 - Includes “Responsiveness Summary” on proposed plan
 - Formally selects remedy
 - Immediately precedes the Remedial Design



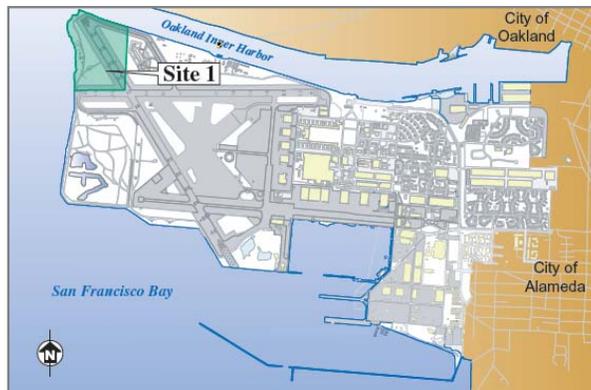
2



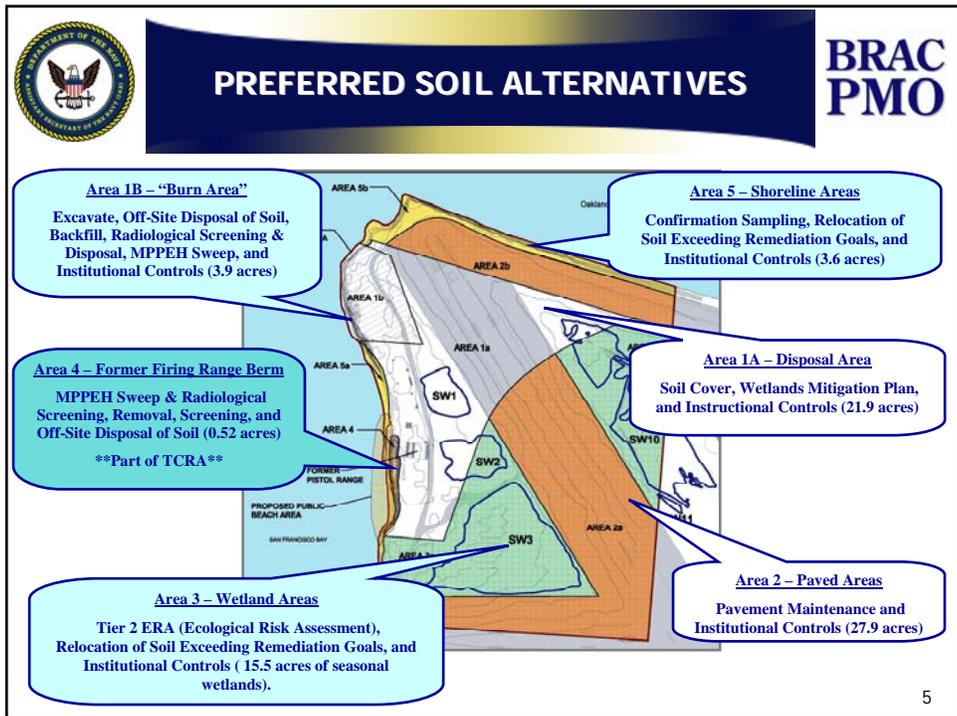
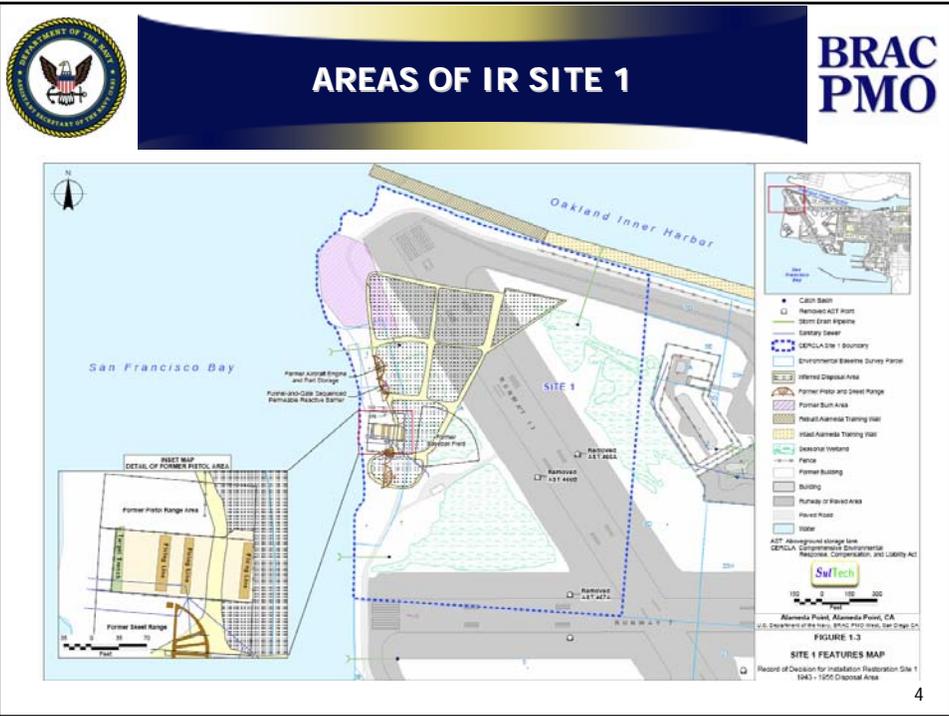
SITE LOCATION

BRAC
PMO

- **Located in northwestern portion of Alameda Point**
- **Site 1 occupies 78 acres**



3





PREFERRED SITE-WIDE RADIOLOGICALLY-IMPACTED SOIL ALTERNATIVE

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PMO

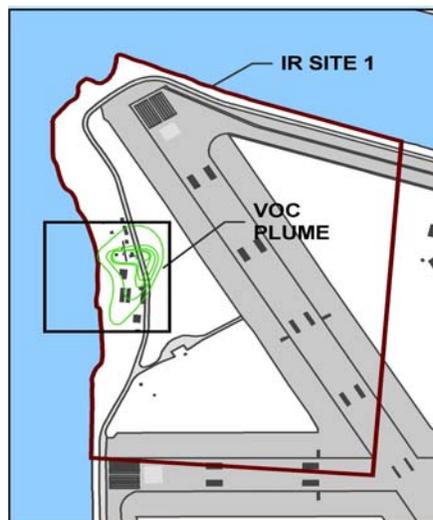
- **TCRA (Time-Critical Removal Action)**
 - Removal and off-site disposal of all impacted soil exceeding remedial action objectives (except Area 1a)
 - Removal of pistol range berm, Area 4
- **Radiological Final Status Survey**
 - Part of Remedial Action
 - Follow Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)

6



PREFERRED GROUNDWATER ALTERNATIVE

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7



PREFERRED GROUNDWATER ALTERNATIVE

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PMO

- **Treat volatile organic compound (VOC) groundwater plume**
 - In situ chemical oxidation (ISCO)
 - Monitored natural attenuation (MNA)
- **Long-term monitoring of metals and VOCs**
 - Ensure permanent reduction of VOCs and associated risks
- **Institutional Controls**
 - Restrict well installation or construction without Navy and regulatory agency consent.
 - Protects Equipment
 - Allow future Navy and Agency Access

8



RAB Summary of Major Issues

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PMO

- **Remove waste**
- **Characterize landfill**
- **Groundwater contamination**
- **Groundwater treatment technology effectiveness**
- **Cap design**
- **Golf course**
- **Closure**

9



Remove Waste

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Comment 8, pg C-15

- Conclusion that these wastes must be excavated and removed from the site
- Closure will be plagued with problems and questions, unless effective action is initiated soon

Response

- Navy and the regulatory agencies (EPA, DTSC, and the Water Board) have reviewed all documents that make up the CERCLA Administrative Record and have agreed that the Navy's proposed remedy will be protective of human health and the environment
- Preferred alternative in accordance with the feasibility study process
- Navy will conduct the remedial design and action phases as expeditiously as possible, in the context of the Federal Facilities Agreement (FFA)

Comment 2, pg C-9

- By fragmenting its assessment into different areas and media, the Navy may have eliminated from consideration certain holistic approaches

Response

- Combined all areas of IR Site 1
 - Evaluated containment for both soil and groundwater
 - Approach is consistent with the CERCLA process
- Feasibility study (FS) and PP are designed to present sufficient information to make a decision between alternatives

10



Characterize Landfill

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Comment 6 (Items 6-10), pg C-11

- Wastes in Site 1 have not been adequately characterized

Response

- Followed EPA's specific CERCLA military landfill and municipal landfill presumptive remedy guidance and policy
 - "Relying on existing data to the extent possible rather than characterizing landfill contents (limited or no landfill source investigation unless there is information indicating a need to investigate hot spots)"
- Enough information and data have been collected to make an appropriate and effective remedial decision
- 307 sample locations, the Navy went beyond the requirements

Major Comment 2, pg C-18

- Extent of waste in the landfill and proximity to San Francisco Bay should be evaluated prior to a final ROD

Response

- Extent of waste in the waste disposal area identified and documented in the RI report (Section 6.8)

11



Characterize Landfill

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Federal Facilities Restoration and Reuse | US EPA

Page 1 of 15



<http://www.epa.gov/fedfac/documents/1296mem.htm>
Last updated on Friday, March 23rd, 2007.
Federal Facilities Restoration and Reuse

You are here: [EPA Home](#), [Federal Facilities Restoration and Reuse](#), [FERRO Library](#), Application of the CERCLA Municipal Landfill Presumptive Remedy to Military Landfills

Application of the CERCLA Municipal Landfill Presumptive Remedy to Military Landfills

United States Environmental Protection Agency

Office of Solid Waste and Emergency Response

Directive No. 9355.0-67FS
EPA/540/F-96/020
PB96-963314

December 1996

Application of the CERCLA Municipal Landfill Presumptive Remedy to Military Landfills

12



Characterize Landfill

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Specific Comment 35, pg C-47

Response

- **Removal of hot spots within Area 1**
 - Do drummed wastes still exist
 - Only after full characterization can the Navy realistically cover the remaining waste
- **Locating hot spots**
 - No evidence during the last 50 years to suggest the presence or location of time-delayed pockets of material or drummed wastes
 - EPA's presumptive remedy guidance indicates that characterization is not necessary

13



Characterize Landfill

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TCE in Air **Comment 26, pg C-42**

Response

- Risk assessment should include the latest information, including the 2006 finding by the National Academy of Sciences (NAS)
 - Additionally, California has a Public Health Goal (PHG) that should become a “To-Be-Considered” Applicable or Relevant and Appropriate Requirement (ARAR). For TCE in groundwater, the PHG was changed from 2.3 ppb to 0.8 ppb
- Groundwater vapor intrusion is a potential concern only if a complete exposure pathway exists
 - Construction of buildings above the VOC plume is prohibited until goals are met
 - Actively treating the VOC plume using ISCO
 - Regulatory agencies have concurred
 - Groundwater not likely to be used as a source of drinking water
 - Public Health Goals for trichloroethylene (TCE) are for drinking water and are not applicable, or relevant and appropriate or to be considered criteria

14



Groundwater Contamination

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PMO

Chemicals Escaping to Bay (8) **Comment 6 (Items 8), pg C-11**

Response

- High probability that contaminated groundwater has been escaping into the Bay; inland from the shoreline; were higher contaminant concentrations at this point [inland] from shoreline used in the ecological risk assessment
- Specific Comment 24, pg C-40**
- Suggests that almost all groundwater underlying Area 1 is contaminated with heavy metals and VOCs
 - Conclude that contaminated groundwater and leachate are making their way to the Bay
- Chemical concentrations outside the VOC plume, and higher chemical concentrations inside the VOC plume were addressed in the ecological risk assessment
- Response
- Groundwater attenuation analysis and the most recent basewide groundwater monitoring report for spring 2006 do not support the conclusion that contaminated groundwater and leachate are migrating to the Bay
 - Attenuation analysis in the FS report (Appendix F3) specifically examines the potential discharge of contaminated groundwater to waters of the Bay as the primary pathway for risk to the environment at IR Site 1. Outside the VOC plume area, the attenuation analysis suggests that there is not a significant source of contamination in the Area 1 subsurface wastes contributing to groundwater contamination

15



Groundwater Treatment Effectiveness

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Comment 6 (Items 4), pg C-11

- Will ISCO be able to achieve cleanup goals?

Response

- Navy has successfully used ISCO to remediate other plumes at Alameda Point containing chemicals similar to those found in the plume at IR Site 1

Comment 6 (Items 5), pg C-11

- Any release of oxidative reagent or other contaminants, such as radium and other metals, into the Bay?

Response

- From past experience, no observed off-site migration of oxidative reagents or metals with ISCO at Alameda
 - Radiological isotopes same geochemical characteristics as other metals
 - Radium migration, same processes as other metals
 - The remedy includes a contingency plan in the event that metals or other chemicals are detected

Comment 8, pg C-20

Monitored Natural Attenuation

- Not rely on Monitored Natural Attenuation (MNA) for a major role in the groundwater remedy

Response

- ISCO is the primary treatment, and MNA would be used as a secondary treatment to reduce residual concentrations of some chemicals to below the groundwater remediation goals

16



Groundwater Treatment Effectiveness

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PMO

Comment 9, pg C-33

Groundwater

- Achieve remedial objectives within a reasonable time frame. Project proponents must demonstrate that human or environmental receptors will not be exposed to greater risks during the long natural attenuation process

Response

- MNA is not the primary, or standalone remedy
- Proposed groundwater alternative will rely most heavily on active ISCO to reduce a significant mass of chemical concentrations
- MNA is anticipated to continue for 3 years after ISCO treatment

Specific Comment 7, pg C-19

Releases During Groundwater Treatment

- Concern that the remedy may lead to the release of other contaminants, including radium and metals
- A network of “Guard wells” and “Sentinel Wells” should be developed

Response

- Groundwater monitoring will be conducted as part of the ISCO treatment
- Remedy includes addition of new wells to supplement existing network. Exact location and number available for review during remedial design phase

Comment 4, pg C-31

ISCO Releasing Stabilized Metals

- Concern that ISCO may cause the release of other contaminants now stabilized in the landfill (metals)
- Capture the oxidants if there is a release of other contaminants

Response

- Preferred remedial alternative includes effectiveness monitoring during the ISCO and MNA
- Remedy includes long-term groundwater monitoring
- Monitoring wells will be placed around perimeter of plume

17



Cap Design

**BRAC
PMO**

Comment 7, pg C-14

Response

Meeting Closure Standards for Landfills

- Soil cover does not meet closure standards for landfills containing municipal wastes
- Soil cover meets applicable, or relevant and appropriate regulations (ARARs), including environmental laws and regulations, and closure standards for landfills containing municipal wastes

Comment 16, pg C-23

Response

Bio-barrier

- Cap should include a bio-barrier
- During remedy analysis, Base Closure Team agreed to increase the thickness to 4 feet to account for burrowing animals
- The remedy includes an Operations & Maintenance (O&M) to help ensure effectiveness of the remedy

18



Golf Course

**BRAC
PMO**

Comment 17, pg C-24

Response

Golf Course

- Unclear whether the Navy has considered the re-use plan for golf course in its remedial design
- The Navy does take into account future re-use of the site, and has reviewed EPA's guidance document for reusing cleaned up Superfund sites and installing golf facilities

Comment 20, pg C-25

Response

Cap Maintenance

- Who will be responsible for maintaining the cap once a golf course is put in place
- Maintenance of soil cover will be included with other institutional controls objectives for the remedial actions
- Navy will seek to transfer this responsibility to the future land-owner by contract, property transfer agreement, or other means. In any event, the Navy retains the ultimate responsibility for the remedy integrity

Comment 30, pg C-45

Response

Golf Course

- Surface inspection of the runways, or for that matter the proposed soil cap or engineered cap, would not be possible once a golf course is built
- Maintenance of the runways would only occur to exposed runways
- EPA has issued an information document entitled "Reusing Cleaned Up Superfund Sites: Golf Facilities Where Waste is Left on Site" that provides examples of installed golf courses successfully being constructed on landfills and that endorses future use of landfills as golf courses

19



Golf Course

BRAC PMO



Reusing Cleaned Up Superfund Sites:

Golf Facilities Where Waste is Left on Site



Closure

BRAC PMO

Comment 6 (Items 6-10), pg C-11

Response

Future Changes

- (7) • Future lowering of cleanup levels goals

- CERCLA accounts for this possibility in the 5-year review process. Navy and regulatory agencies will review any newly promulgated standards that are potential ARARs during these reviews

Comment 18, pg C-24

Response

Climate Change

- Climate change is expected to cause sea levels to rise by approximately 3 feet over the next 100 years
- Proposed remedies that are adjacent to the Bay should take this into consideration

- CERCLA remedial process includes 5-year review
- The five-year review process includes assessing if any other information has come to light that could call into question the protectiveness of the remedy

Comment 11, pg C-21

Response

Monitoring Environmental Change

- Other chemicals can be mobilized by changing environmental conditions
- Investigate and determine a mechanism for monitoring environmental change

- Established a basewide groundwater monitoring program, and will be updated if necessary to account for the ARARs determination in the ROD



**BRAC
PMO**

Questions ?

ATTACHMENT B-3

RESPONSE TO COMMUNITY COMMENTS ON THE FINAL PP FOR IR SITE 1

(53 Pages)

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RESPONSES TO PUBLIC COMMENTS ON THE FINAL PROPOSED PLAN FOR IR SITE 1, 1943-1956 DISPOSAL AREA, ALAMEDA POINT, ALAMEDA, CALIFORNIA

This document presents the U.S. Department of the Navy's (Navy) responses to public comments on the "Proposed Plan [PP] for Installation Restoration [IR] Site 1, 1943-1956 Disposal Area, Alameda Naval Air Station, Alameda Point, Alameda, California," dated September 2006. Comments were received from the Alameda Reuse and Redevelopment Authority (ARRA) on November 9, 2006, and the Alameda Point Restoration Advisory Board (RAB) on November 10, 2006. The comments from the RAB included an attachment with comments from Peter Strauss of PM Strauss & Associates, who reviewed the PP through a Technical Assistance for Public Participation (TAPP) grant on behalf of the RAB. The Navy's responses to comments received from ARRA, the RAB, and Mr. Strauss are provided below.

RESPONSES TO COMMENTS FROM ARRA

1. **Comment:** Two of the PP's proposed institutional controls are overly broad and should not be included in the ROD. The PP proposes to establish institutional controls that would prohibit certain activities in areas where contamination has not been found. Specifically:

- *"Prohibit demolition activities (including paved surfaces), unless transferees gain regulatory and Navy approval and comply with a risk management plan [even outside the boundary of the landfill].*
- *"Restrict excavation and/or disturbance of soil in areas within the boundary of IR Site 1, but outside the boundary of Area 1A [the landfill], unless transferees gain regulatory and Navy approval and comply with a risk management plan. (PP, p. 7)*

The Navy's PP proposes removal of all soil contamination in areas outside the landfill:

- Area 1 soil contamination is documented by historical aerial photographs of the landfill (Area 1A) and by sampling in the burn area (Area 1B). Wastes in the burn area are proposed for excavation, but the Navy proposes to leave the landfilled wastes in place.
- In Area 2 (the runways, taxiways, and other paved areas) no soil contamination has been observed.
- In Area 3 (the unpaved areas outside of the former disposal areas) surface soil contamination by PAHs (polynuclear aromatic hydrocarbons), PCBs (polychlorinated biphenyls), metals, and radium is present in hot spots. No soil contamination was found in any of the eight deeper soil samples from this area. The PP proposes removal of all Area 3 soil hot spots.

RESPONSES TO COMMENTS FROM ARRA (CONTINUED)

- Area 4 (the pistol range berm) is proposed for complete excavation. This remediation eliminates the PAHs, PCBs, and MEC (munitions and explosives of concern) contamination that has been observed in this area's soil.
- In Area 5 (the shoreline) surface soil is contaminated with VOCs (volatile organic compounds), SVOCs (semivolatile organic compounds), PCBs, metals, and radium in hot spots. None of the three deeper soil samples was contaminated. The PP proposes excavation of all Area 5 soil hot spots.
- Radium contamination occurs in shallow soil across much of IR Site 1. The PP proposes excavation of all radium hot spots beyond the landfill boundary.

The Navy collected eight soil samples from Area 3 from below 2 feet bgs (below ground surface) and three soil samples from Area 5. Although the Navy analyzed these samples for a wide suite of analytes, none of the soil samples from deeper than two feet bgs in IR Site 1 (other than in Area 1) exceed any USEPA PRGs (Preliminary Remediation Goals). Therefore, the remedial investigation does not provide a basis for any remediation, including institutional controls restricting or prohibiting disturbance of soil or pavement.

The remedial investigation provides no rationale for concluding subsurface soil in IR Site 1 is any different from subsurface soil elsewhere in the runways area. Significantly, neither the Navy nor any environmental regulatory agency has identified the need for similar institutional controls on any other portions of the runways area. If the Navy believes subsurface soil contamination might be present in IR Site 1 (outside of the landfill), from which public health should be protected, the Navy should investigate the issue, rather than simply impose institution controls. Potentially overly protective institutional controls should not substitute for thorough investigation. Remedial Alternatives S2-3 (a preferred alternative), S2-4, S3-4 (a preferred alternative), S5-4 (a preferred alternative), S5-5, and S5-6 are all impacted by this issue. These alternatives generally require institutional controls restricting contact with subsurface soils, even after the Navy remediates the surface soil, which contains all known soil contamination. Imposing the burden of institution controls on land that does not require remediation is not a cost-effective remedy, nor is it consistent with spirit or letter of the CERCLA process.

Response: The Navy believes that the use of institutional controls (IC) is an appropriate component of the remedial actions selected, and it is consistent with the Comprehensive Environmental Response,

RESPONSES TO COMMENTS FROM ARRA (CONTINUED)

Compensation, and Liability Act (CERCLA) to impose ICs to protect the effectiveness of the selected remedy. Soil Area 4 is being excavated under a time-critical removal action (TCRA). All contamination will be removed from Area 4, so no remedial action, including ICs, is selected for Area 4 in the Record of Decision (ROD).

Although the Navy believes that proposed soil excavation and removal in areas outside Area 1a should remove all hazardous substances posing unacceptable risk for the planned recreational reuse and ecological receptors, there is some remaining uncertainty regarding the potential presence of residual concentrations of chemicals in soil presenting unacceptable risk receptors under to other future scenarios (for example, the residential scenario). At Area 2, ICs will ensure the integrity of the existing cap (the runway), which provides an extremely effective means of protecting against any residual contamination because there is no exposure pathway. The runway has been estimated to be at least 4 feet thick and consists of reinforced concrete (Bechtel Environmental, Inc. [BEI] 2006, Appendix D). To further investigate soil beneath the runway, the Navy would need to destroy the concrete cover, which could create additional risk through excavation activities, hauling and trucking activities, and creation of exposure pathways for construction workers. As it currently exists, the runway provides a highly effective barrier that protects potential receptors from any potential contamination that may exist below the concrete cover.

Additionally, at Area 5, ICs will also be implemented to prevent disturbance of soil in the shoreline areas, which include Area 5a, Area 5b, and the shoreline in Area 1b within 25 feet of San Francisco Bay. The ICs are necessary to protect the effectiveness of the remedy, including any shoreline slope stability, surface runoff and runoff, and erosion control measures implemented as part of the remedy.

2. Comment: The Navy should remove all wastes from the IR Site 1 landfill, with off-site disposal. At its November 1, 2006 meeting, the ARRA Board acted to adopt two positions:

- **Alternative S 1-5 (complete removal of wastes in the landfill) is the preferred remediation for soil in Area 1, and**
- **Alternative S1-4a (soil cover on the landfill) is unacceptable remediation for soil in Area 1.**

Among the considerations favoring Alternative S 1-5 are:

- 1) The Navy has never characterized wastes buried in the Area 1 landfill by sampling or other observation. This landfill was the**

RESPONSES TO COMMENTS FROM ARRA (CONTINUED)

primary waste disposal location for the Naval Air Station Alameda from 1943 until 1956.

- 2) The landfill is very close to San Francisco Bay and the Oakland Inner Harbor. Earthquakes, tsunamis, storm surges, and long-term shoreline erosion could lead to hazardous wastes reaching these water bodies. If the wastes were disposed offsite, aquatic habitats in the area would be protected from these hazards.
- 3) The *PP* proposes to remediate contaminated groundwater flowing from the landfill toward San Francisco Bay using in situ chemical treatment. However, buried wastes will continue to recontaminate the groundwater, unless the source of the groundwater contamination the landfill-is removed. The Navy likely will need to continue groundwater remediation for the foreseeable future because the source of contamination is still present. Excavating the landfill with offsite disposal allows permanent groundwater cleanup.
- 4) Future land use of the landfill footprint will be complicated and more costly because buried hazardous wastes are present. The planned future use of the landfill is a golf course. Design, maintenance, and operation of the golf course will be more difficult due to the wastes, for example, topographic contouring, irrigation, landscape planting, the acceptability and placement of water hazards, accommodation of wells for landfill monitoring, etc. If the landfill were excavated and disposed offsite, routine design, maintenance, and operation of the golf course could occur.
- 5) The public's enjoyment of this area will be lessened by the presence of a hazardous waste landfill. Some potential users of this planned segment of the Bay Trail may avoid the area for fear of the wastes. Regardless of whether such fears are justified, the public's recreational use of park areas should not be compromised by buried wastes, unless necessary.

- Response:**
- 1) The Navy acknowledges that it has never fully characterized wastes buried in the Area 1 waste disposal area during the remedial investigation (RI) phases. The Navy has delineated the extent of the waste disposal area, including the former burn area, in accordance with U.S. Environmental Protection Agency (EPA) guidance (EPA 1993) based on historical information such as past military operations records from 1943 to 1956, aerial photographs, and results for 307 soil samples collected for chemical analysis from the waste disposal area (BEI 2006, p. 2-34).

RESPONSES TO COMMENTS FROM ARRA (CONTINUED)

Area 1 was not fully characterized because it is a waste disposal area, and EPA presumptive remedy guidance does not require full characterization (EPA 1993 and 1996). In 1993, EPA established guidance and policy directing source containment as the presumptive remedy for municipal landfill sites regulated under CERCLA (EPA 1993). EPA's policy is that response actions that require characterization of disposed wastes, such as on-site treatment, are impracticable for landfills such as the Area 1 landfill because of the size and heterogeneity of the disposed wastes (EPA 1993).¹ In 1996, EPA established guidance and policy directing that the municipal landfill presumptive remedy also applies to all appropriate military landfills (EPA 1996). It should also be noted that throughout the investigation years, by collecting samples at 307 locations, the Navy went well beyond the requirements necessary for characterizing a waste disposal area.

- 2) The cover will be designed to meet landfill applicable and relevant or appropriate requirements (ARAR) regarding seismic stability in the remedial design (RD). The regulatory agencies will be able to comment and ensure that the Navy follows these and all required ARARs. Seismic design and shoreline erosion will be addressed during the RD and will meet all ARARs regarding seismic stability of landfills.
- 3) The preferred groundwater alternative includes *in-situ* chemical oxidation (ISCO) and monitored natural attenuation (MNA). These technologies are anticipated to clean up groundwater within 5 years. There is no anticipated continuing source of groundwater contamination. All materials containing groundwater contaminants have been in place for over 50 years, and the potential for any further chemical releases is considered low.
- 4) The golf course would be located on top of the 4-foot-thick soil cover, and the soil cover would be maintained. Although the design, maintenance, and operation of the golf course is beyond the scope of the CERCLA process, the soil cover is well-suited for recreational reuse as a golf course as described below.

¹ EPA indicates that the remediation of sites with similar characteristics may be accelerated by using a "presumptive remedy." A presumptive remedy is based on EPA's experience, which demonstrates that when sites have similar characteristics, those characteristics result in the selection of similar remedies in the RODs. EPA's approach to presumptive remedies is provided by EPA's Superfund Accelerated Cleanup Model, (SACM). See <http://www.epa.gov/superfund/resources/presump/> for additional information concerning presumptive remedies. (EPA 1993, p. 29). EPA's presumptive remedies allow for containment of waste where treatment is impracticable, such as at sites with large quantities of heterogeneous wastes. For example, the presumptive remedy for source containment at landfill sites includes the following components: a protective cover, source area groundwater control to contain a plume, leachate collection and treatment, landfill gas collection and treatment, and/or ICs to supplement engineering controls. An EPA report entitled "Presumptive Remedy for CERCLA Municipal Landfill Sites" (EPA 540-F-93-035) presents source containment components for municipal landfill sites (EPA 2003).

RESPONSES TO COMMENTS FROM ARRA (CONTINUED)

- 5) The reviewer incorrectly alludes to the former waste disposal area, Area 1, as a hazardous waste landfill. The waste disposal area meets the definition of a former municipal landfill because it contains a combination of principally municipal and, to a lesser extent, hazardous wastes (EPA 1993).

EPA's past experience with Superfund sites, including hazardous waste landfills, suggests that the public's enjoyment of this area will not be lessened because it contains on-site buried waste. EPA indicates that sites where wastes are contained on site are often well-suited for recreational uses such as golf courses (EPA 2003, p. 1). EPA has prepared a guidance document for reusing cleaned up Superfund sites and installing golf facilities (EPA 2003). Construction of golf courses on landfills that are Superfund sites is a common practice throughout the United States (EPA 2003).

At Area 1, the former waste disposal area, the 4-foot-thick soil cover will meet and exceed the EPA guidance for golf courses. Many golf courses have been built on closed landfills, and the 4-foot-thick soil cover is an effective remedy that does not limit the intended use as a golf course.

In addition to the soil cover being protective of human health and the environment and consistent with the remedy for hazardous waste landfills, a soil cover is also consistent with past burial of waste disposal areas along the Bay Trail at locations such as Crissy Field in San Francisco within viewing distance of the Golden Gate Bridge. The Bay Trail has been successful at Crissy Field in San Francisco, a well-known and heavily traveled area by pedestrians. In addition, the Navy will be reviewing the protectiveness of the soil cover during the planned 5-year reviews (FYR).

EPA's past experience with the successful implementation of golf courses on top of hazardous waste landfills, the current use of Crissy Field in San Francisco, and the planned ongoing FYRs of the remedy demonstrate the success of golf courses on former landfills.

In summary, Soil Alternative S1-4a (soil cover on the waste disposal area) meets CERCLA threshold criteria for response remedies, is protective of human health and the environment, and complies with all ARARs. In following the CERCLA process, a soil cover best achieves the CERCLA balancing criteria because the soil cover over the waste disposal area meets EPA's policy and guidance for application of the CERCLA municipal landfill presumptive remedy of containment to military landfills. State and federal regulatory agencies have been

RESPONSES TO COMMENTS FROM ARRA (CONTINUED)

involved throughout the CERCLA process, and the regulators agree with the soil cover (Soil Alternative S1-4a) as the preferred alternative.

3. **Comment:** **As stated in ARRA's comments on earlier IR Site 1 documents, an engineered cap (Alternative S 1-4b) is a better remedial alternative than a soil cover, An engineered cap is the standard method of topping a hazardous waste landfill.**

Response: The PP shows that both a soil cover, Soil Alternative S1-4a, and an engineered alternative cap (engineered cap), Soil Alternative S1-4b, are equivalent for protection of human health and the environment and compliance with environmental laws and regulations. When comparing the alternatives using the National Oil and Hazardous Substances Contingency Plan (NCP) balancing criteria, both offer equivalent long-term effectiveness and implementability, and the soil cover offers better short-term effectiveness and cost. Based on this evaluation, the soil cover is the preferred alternative. The regulatory agencies have agreed with this analysis.

4. **Comment:** **It is highly uncertain that a soil cover will be effective into the future, especially if container failure releases drummed wastes into the groundwater. If groundwater migration from the landfill worsens for this or any other reason, the environmental regulatory agencies likely would require the Navy to upgrade the soil cover to an engineered cap. An engineered cap will be much more effective than a soil cover in preventing precipitation from percolating into the landfill. Excluding percolation of precipitation into the landfill is one important method of minimizing leachate formation and subsequent migration.**

Response: Historical and technical information indicates that new releases to groundwater are highly unlikely and that groundwater migration will not worsen at this landfill, where disposal activities ended over 50 years ago. According to the initial assessment study, historical information indicates that drums were crushed during disposal (Ecology & Environment, Inc. 1983). This fact, coupled with the fact that wastes were buried beneath the current groundwater table, makes it unlikely that drums remain intact within the disposal area. Because the waste is positioned primarily in the saturated zone, the Navy believes that over the years, significant decomposition has already occurred. The relatively low groundwater contamination reported at IR Site 1 (except for the volatile organic compound [VOC] plume, which the Navy is proposing to actively remediate) leads to the conclusion that the leaching process has already taken place, the remaining waste is in a very stable condition, and the

RESPONSES TO COMMENTS FROM ARRA (CONTINUED)

remaining waste is unlikely to further contaminate groundwater or San Francisco Bay.

5. **Comment:** **Retrofitting an engineered cap will severely disrupt golf course operations. The public will lose its use of the golf course, and the golf course will lose revenues. The proposed soil cover alternative (S1-4a) is only twenty-five percent less expensive than the engineered cap alternative (S 1-4b). This marginal cost is outweighed by the marginal benefit of uninterrupted golf course operations.**

Response: The Navy has evaluated the alternatives based on a final recreational land use, which could include a golf course, and has included ICs within the alternative to ensure that the integrity of the soil cover is not compromised. Both the Navy and the regulatory agencies (EPA, Department of Toxic Substances Control [DTSC], and the San Francisco Bay Regional Water Quality Control Board [Water Board]) concur with the proposed remedy of a 4-foot-thick soil cover. The Navy and the regulatory agencies do not anticipate that the remedy will fail and that retrofitting will be required

RESPONSES TO COMMENTS FROM THE RAB

GENERAL COMMENTS

1. **Comment:** Mr. Strauss has done an outstanding job of reviewing the myriad documents and background materials, considering the limited time available. We are deeply appreciative to the Navy for financing this TAPP grant review. Without this help, it would have been virtually impossible for us to devote the time and effort which would have been necessary to review this proposal plan.

Response: The Navy appreciates the technical review of the PP by the RAB and by the RAB's TAPP grantee, Peter Strauss. The TAPP grant review provides an independent professional examination of the PP. The Navy is pleased to address the TAPP grantee review comments and expects that the clarifications will assist in community concurrence and acceptance of the preferred alternatives presented in the PP.

2. **Comment:** Mr. Strauss's insightful analysis has brought to light a number of data gaps and uncertainties, particularly with regard to soil in Area 1a and contaminated groundwater. By fragmenting its assessment into different areas and media, the Navy may have ~~eliminated from~~ consideration certain holistic approaches such as a low-permeability cap, combined with a hydraulic barrier around the waste cell area and groundwater treatment. Further, the Navy's reluctance to commit to specific design criteria at this point in the process makes it difficult to evaluate or accept its preferred alternatives. Therefore, we have reluctantly concluded that Alternative S-1-5, "Complete Removal" is the only acceptable solution for soil in Area 1a (the waste-cell area).

Response: The Navy combined all areas of IR Site 1 and evaluated remedial alternatives that would address contamination that poses risk to human health and the environment as required by CERCLA and the NCP. During the process, the Navy evaluated containment for both soil and groundwater. Containment, which can include a low-permeability cap combined with a hydraulic barrier around the waste disposal area, was examined as a potential technology for both soil and groundwater and was eliminated in the feasibility study ([FS] BEI 2006, Section 4.3). The Navy's approach for preparing the FS report and PP is consistent with the CERCLA process. The FS Report and PP are designed to present sufficient information to make a decision between alternatives. In the CERCLA process, specific design criteria are developed during the RD.

RESPONSES TO COMMENTS FROM THE RAB (CONTINUED)

3. **Comment:** Under Alternative S-1-5, it appears that the wastes removed would have to be scanned for radioactivity so that radium, and possibly other radioisotopes, could be separated out prior to the separate off-site disposal of radioactive and chemical hazardous wastes. This could circumvent the problem of disposing of "mixed wastes". During excavation it may be possible to identify and sort out inert, uncontaminated materials.

Response: This comment is noted. With Soil Alternative S1-5, as indicated in the FS report, radiologically impacted waste would be identified and separated from non-radiologically impacted waste and then disposed of separately (BEI 2006, p. 5-8).

4. **Comment:** "Complete removal" would include excavation and removal of hazardous wastes in cells or other areas underneath the runway(s). The concrete rubble created by demolition of that portion of the runway(s) over the wastes probably would have a significant salvage value.

Response: This comment is noted. The financial returns from recycling of demolished concrete (runways) were assumed based on "remove and recycle concrete paving" in the cost estimates for Area 1 presented in the FS report (BEI 2006, Appendix D, Table D-10).

5. **Comment:** The contaminated groundwater would have to be pumped out of the excavation pits and extensively treated prior to disposal. Appropriate protective measures would have to be taken to protect workers against any hazardous gases and vapors, such as vinyl chloride. Finally, the excavated area would have to be backfilled with clean soil.

Response: The reviewer is correct. The Navy fully intends that protective measures for worker health and safety will be implemented as part of the remedial action. Pumping and treating contaminated groundwater; implementing appropriate protective measures for workers, including protecting workers against hazardous gases and vapors; and backfilling removed materials with clean soil are included in Appendix D of the FS report for the various alternatives. These alternatives include protection of workers with appropriate health and safety planning and measures (BEI 2006, Appendix D).

RESPONSES TO COMMENTS FROM THE RAB (CONTINUED)

6. **Comment:** The many uncertainties associated with the Navy's preferred solution will continue to haunt Site 1 remediation until the waste cell hazardous materials are excavated and removed offsite. These unresolved problems include:
- (1) Whether a soil cap and shoreline seismic stability barrier can be designed adequate to meet a design basis seismic event.
 - (2) The difficulty of detecting cap failure and repairing it after the cap is covered up by the golf course.
 - (3) Transference to the City and/or park district of unacceptable costs for future cleanup and repair of the cap and perimeter bank failure due to inadequate seismic design criteria. This would include the cost of environmental damage insurance.
 - (4) Whether the preferred in-situ chemical oxidation (ISCO) will be able to achieve cleanup goals for all groundwater contaminants.
 - (5) Whether the oxidative reagent (Fenton's reagent) or seawater will release other contaminants, such as radium and other metals, into the Bay.
 - (6) The lack of a definitive survey to identify special status species. This could substantially affect cleanup goals.
 - (7) Possible future lowering of cleanup level goals for certain chemicals such as TCE, DCE, and vinyl chloride.
 - (8) There is a high probability that contaminated groundwater has been escaping into the Bay for many years ("Draft Alameda Basewide Annual Groundwater Monitoring Report, Spring 2006", Oct. 2006). The true mixing point at which these contaminants are mixing with Bay waters is apparently some distance inland from the shoreline. It is questionable whether the higher contaminant concentrations at this point were used in the ecological risk assessment.
 - (9) Possible future damage to and release of Area Ia wastes due to global warming, rising sea levels and seismically generated tsunamis.
 - (10) The wastes in Site 1 have not been adequately characterized as to types, quantities, or location.

RESPONSES TO COMMENTS FROM THE RAB (CONTINUED)

Response: The Navy appreciates the RAB listing of perceived unresolved problems and the opportunity to present explanations. The Navy's responses are provided below for each item.

- Items 1 and 9. The seismic design of the soil cover will be addressed during the RD. The cap will be designed to meet seismic design criteria.
- Item 3. Under CERCLA, the Navy retains responsibility for ensuring the integrity of the remedy. Through CERCLA, the remedy will be reviewed every 5 years. The FYR generally consists of two components: an analysis of whether the remedy is still protecting human health and the environment and a list of additional maintenance activities that need to be performed to ensure continued protectiveness, including the identity of parties responsible for these activities. The results of these reviews can be used to modify operating plans for the site. The Navy and regulatory agencies will review any newly promulgated standards that are potential ARARs during the FYR process and respond to them as required by CERCLA and the NCP.
- Item 2. The 4-foot-thick soil cover will be designed to meet the remedial action objective (RAO) of preventing exposure to underlying wastes, and the presence of a golf course will not diminish this function. The additional presence of the golf course will enhance the ability of the soil cover to minimize potential exposure to wastes that remain in underlying soil. Because the soil cover does not include a low-permeability layer, it avoids the most prevalent mechanisms for cap failure. EPA guidance indicates that cap failure occurs mostly from liner failures due to consolidation of waste and resulting settlement (EPA 2003). Settlement will be estimated during the RD to account for potential future use, such as a golf course, and will be monitored (BEI 2006, Section 7.2).
- Item 4. ISCO will be combined with MNA to achieve the cleanup goals for organic chemicals in groundwater. The Navy has successfully used ISCO to remediate other plumes at Alameda Point containing chemicals similar to those found in the plume at IR Site 1.
- Item 5. Monitoring for the release of oxidative reagents and other chemicals into the Bay is included as part of the relevant groundwater alternatives. From past experience at Alameda Point, the Navy has not observed off-site migration of oxidative reagents or metals when ISCO was used to remediate groundwater contaminated with VOCs at Site 16. Radiological isotopes encountered in the disposal area have the same geochemical characteristics as other metals. Their migration in groundwater would be subject to the same processes as other metals.

RESPONSES TO COMMENTS FROM THE RAB (CONTINUED)

Consequently, the Navy does not anticipate that ISCO will initiate migration of other contaminants into San Francisco Bay. However, the remedial action work plan will develop a contingency plan in the event that metals or other contaminants are detected in perimeter monitoring wells at concentrations above action levels.

- Item 6. The Navy has conducted several surveys for special-status species at Alameda Point. The findings are summarized in a biological assessment prepared for consultation with the U.S. Fish and Wildlife Service (Navy and Tetra Tech, Inc. 1997). No special-status species have been encountered at IR Site 1.
- Item 7. Cleanup goals were developed through technical consultation with the regulatory agencies and were deemed appropriate for this site. The Navy and regulatory agencies will review any newly promulgated standards that are potential ARARs during the FYR process and respond to them as required by CERCLA and the NCP.
- Item 8. Chemical concentrations outside the VOC plume and higher chemical concentrations within the VOC plume were addressed in the ecological risk assessment (Tetra Tech EM Inc. 1999).
- Item 9. If changes to the remedy are necessitated by any of the extreme circumstances suggested, CERCLA requires the FYR process to evaluate protectiveness every 5 years. Future changes would be evaluated at that time. The CERCLA remedial process is coupled to the FYR process for the duration of the ICs. In addition, the CERCLA process is designed to make necessary adjustments to account for these types of uncertainties.
- Item 10. The wastes types, quantities, and locations at IR Site 1 were adequately and appropriately characterized during the RI based on historical data (Tetra Tech EM Inc. 1999). To adequately and appropriately characterize the waste, the Navy has followed EPA's specific CERCLA military landfill (EPA 1996) and municipal landfill (EPA 1993) presumptive remedy guidance and policy. EPA's guidance indicates that characterization of a landfill's contents through sampling and observation is not necessary or appropriate for selecting a response action (EPA 1993). EPA has recognized that response actions that require characterization of disposed waste, such as on-site treatment, are impracticable for landfills such as the Area 1 landfill because of the size and heterogeneity of the disposed wastes (EPA 1993). The Navy believes that enough information and data have been collected to make an appropriate and effective remedial decision for this site that is protective of human health and the environment.

RESPONSES TO COMMENTS FROM THE RAB (CONTINUED)

7. **Comment:** In retrospect, the disposal of hazardous wastes and materials into Sites 1 and 2, immediately adjacent to San Francisco Bay, was extremely ill-advised. Certainly, such practices would never be seriously considered today. The alternatives proposed by the Navy for closure of Site 1 do not even meet closure standards for landfills containing municipal wastes.

Response: The Navy concurs that the regulations governing disposal of wastes have changed since 1956. As explained above in Response to ARRA Comment 3, Alternative S1-4a, a soil cover meets environmental laws and regulations, ARARs. ARARs, including closure standards for landfills containing municipal wastes, were evaluated during development of the alternatives presented in the FS report, and the site will be closed in accordance with the applicable *California Code of Regulations* (Cal Code Regs.). The Navy has identified the following landfill closure requirements as ARARs for IR Site 1:

- Cal. Code Regs. Title (tit.) 27, Section (§) 20921(a)(1)-(3) (landfill gas control)
- Cal. Code Regs. tit. 27, §§ 20365(c) and (d) and §§ 21090(c)(4) and 21150 (erosion control)
- Cal Code Regs. tit. 27, §§ 20080(b) and 21090(a) (engineered alternatives to final cover)
- Cal. Code Regs. tit. 27, § 21090(a)(3) (vegetative layer)
- Cal. Code Regs. tit. 27, § 21090(b)(1) (final grading)

Furthermore, groundwater monitoring will occur after ISCO and MNA to monitor the effectiveness of the natural attenuation of residual concentrations remaining in the groundwater after treatment.

The Navy has identified the following groundwater monitoring requirements as ARARs for Site 1:

- Cal. Code Regs. tit. 22 § 66264.100(d) to establish and maintain a corrective action program
- Cal. Code Regs. tit. 22, § 66264.93 to determine chemicals of concern (COC)
- Cal. Code Regs. tit. 22, § 66264.95(a) and (b) to determine point of compliance

RESPONSES TO COMMENTS FROM THE RAB (CONTINUED)

- Cal. Code Regs. tit. 22, §§ 66264.97(b)(1)(A), 66264.97 (b)(1)(D)(1) and (b)(1)(D)(2), 66264.97(b)(2), 66264.97(b)(4) – (7), 66264.97(e)(6), 66264.97(e)(12)(A) and (B), 66264.97(e)(13), and 66264.97(e)(15) for general corrective action monitoring requirements
- Cal. Code Regs. tit. 22, §§ 66264.98(e)(1)-(e)(5), 66264.98(i), 66264.98(j), 66264.98(k)(1)-(k)(3), 66264.98(k)(4)(A), 66264.98(k)(4)(D), 66264.98(k)(5), 66264.98(k)(7)(C) and (D), 66264.98(n)(1), and 66264.98(n)(2)(B) and (n)(2)(C) for detection monitoring requirements
- Cal. Code Regs. tit. 22, §§ 66264.99(b), 66264.99(e)(1)-(e)(6), and 66264.99(f)(3) and (g) for evaluation monitoring requirements
- Cal. Code Regs. tit. 22, §§ 66264.97(b)(1)(A), (b)(1)(B) and (C), 66264.97(b)(4)-(7), 66264.97(e)(6), 66264.97(e)(12)(A) and (B), 66264.97(e)(13), and 66264.97(e)(15) for general monitoring requirements
- Cal. Code Regs. tit. 22, §§ 66264.90(c)(1) and (c)(2) to determine when detection and evaluation monitoring are no longer required
- Cal. Code Regs. tit. 27, § 20430(g)(2), which requires eight evenly spaced sampling events to demonstrate compliance with groundwater remediation goals

8. **Comment:** **Now is the time to confront the inevitable conclusion that these wastes must be excavated and removed from the site. We are acutely aware that there are high costs associated with this approach, but further delaying hard decisions will, in the long run, make the costs even higher. This site closure will to be plagued with problems and questions, unless effective action is initiated soon.**

Response: The Navy appreciates the RAB's input. The Navy and the regulatory agencies (EPA, DTSC, and the Water Board) have reviewed all documents that make up the CERCLA Administrative Record and have agreed that the Navy's proposed remedy will be protective of human health and the environment and will meet all identified ARARs for IR Site 1. The FS report identifies the preferred alternative in accordance with the FS process (BEI 2006) and EPA's policy and presumptive remedy guidance for CERCLA municipal and military landfills. The Navy intends to conduct the RD and remedial action phases as expeditiously as possible.

RESPONSES TO COMMENTS FROM THE RAB (FROM PETER STRAUSS, TAPP CONSULTANT)

The Navy appreciates the technical review of the PP by the RAB and the RAB's TAPP grantee, Peter Strauss. The Navy is pleased to address the review comments and expects that this responsiveness summary, which extracts information from the FS report, RI report, and other supporting documents, will provide the additional explanation for community understanding and acceptance of the preferred remedies.

The RAB comments included an attached letter from Mr. Strauss. Mr. Strauss's comments are presented as general, major, and specific comments attached to his transmittal letter dated November 10, 2006. The Navy's responses are provided below after each comment.

GENERAL COMMENTS IN COVER LETTER

1. **Comment:** It is clear that a lot of work has gone into the Proposed Plan. However, based on my analysis, I do not believe it will assure protection to the public, the future landowners and the environment. I do believe that there are elements of the Proposed Plan that are important to begin. Therefore, my overarching recommendation is that this Plan become an interim Plan until certain information is developed.

Response: The PP includes remedial alternatives that comprehensively address groundwater and soil contamination. The remedial alternatives are designed to satisfy the nine NCP criteria, which are designed to protect human health and the environment and to integrate with future land use. The Navy intends that the remedy selected in the ROD will be the final remedy. The remedy includes monitoring requirements, and the remedy will be reviewed every 5 years as required by CERCLA in order to ensure that it remains protective.

2. **Comment:** From years of environmental experience with cleanup, significant uncertainty about attaining deadlines and Remedial Action Objectives (RAOs) require adopting a flexible, adaptive approach for cleanup. There are always going to be some unknowns in a cleanup, but these should be limited to the extent possible. The Proposed Plan will lead to the Record of Decision, which is the key legal framework for cleanup of the site. The ROD is essentially the strategic Plan for achieving the RAOs. That being stated, the Navy is placing too much emphasis on resolving issues in the remedial design phase, where public stakeholders have little or no say.

Response: The PP and ROD provide direction and identify requirements that must be complied with during the RD. The RD will not modify and will conform to the selected remedy, on which the public was given the proper

RESPONSES TO COMMENTS FROM PETER STRAUSS (CONTINUED)

opportunity to comment. The Navy has responded to all specific comments below regarding perceived insufficient details in the PP. These responses demonstrate that the PP does contain sufficient detail for making decisions on the general strategies adopted to meet the RAOs.

3. **Comment:** Elements of the Plan that should begin without further investigation or delay include removal of the pistol range berm and removal of radioactively contaminated wastes in areas 3, 5, 1b, and the site of the radium disposal trench. However, if groundwater is encountered at Area 1b, it is my recommendation that work should be halted until one of the important data gaps is resolved; that is, an evaluation of dioxins and furans in groundwater in the former burn area. If results are positive, this should be followed by a determination of an appropriate treatment system for removing this contaminant from the dewatering activities. When this is completed, then full excavation of the burn area should proceed.

Response: The expedited removal activities of radiological material at the pistol range berm and in Areas 3, 5, and 1b, including the radium disposal trench, are currently being addressed under the TCRA. During the removal of radiologically-impacted wastes from Area 1b, if new contaminants are encountered that are not addressed in the PP and ROD, data will be reviewed, and in compliance with the NCP, a determination will be made whether an explanation of significant differences (ESD) or ROD amendment is appropriate. During dewatering, potential dioxins and furans encountered will be disposed of properly. It should also be noted that dioxins and furans are virtually insoluble in water and that their presence would likely result from soil particles being present in groundwater samples. The disposal of any contaminated waste (soil or water) that result from dewatering will be conducted in accordance with ARARs.

MAJOR COMMENTS IN COVER LETTER

1. **Comment:** Other potential groundwater constituents, as identified in data gaps in the Feasibility Study should be evaluated prior to a final ROD.

Response: The Navy believes it is unnecessary to collect groundwater samples prior to the RD. However, if during groundwater monitoring, new contaminants are encountered that are not addressed in the PP and ROD, data will be reviewed, and in compliance with the NCP, a determination will be made whether an ESD or ROD amendment is appropriate. Please

RESPONSES TO COMMENTS FROM PETER STRAUSS (CONTINUED)

see the response to Specific Comment 1 in Specific Comments in Attachment regarding data gaps

2. **Comment:** **Geophysical surveys to determine the extent of waste in the landfill and proximity to San Francisco Bay should be evaluated prior to a final ROD.**

Response: The extent of waste in the waste disposal area has already been identified and is documented in the RI report (Tetra Tech EM Inc. 1999). The 4-foot-thick soil cover will be designed to cover the entire extent of waste in Area 1a.

3. **Comment:** **The entire issue of seismic stability should be revisited prior to a final ROD. Resolution of this involves the remedy selection and is not appropriate to be left to the design phase.**

Response: The seismic stability of the remedy will be addressed as part of the RD. The proposed remedy will be designed to comply with identified ARARs. For seismic stability, the applicable ARARs are the following: Resource Conservation and Recovery Act (RCRA) seismic requirements, Cal. Code Regs. tit. 22, § 66264.310 (a)(5).

4. **Comment:** **A wetland mitigation ratio of 2:1 should be the minimum ratio allowed.**

Response: An appropriate wetlands mitigation ratio will be developed. During the development of the FS, a conservative ratio of 1:1 was assumed in the development of the cost estimates (BEI 2006, Appendix D, Table D-4). The wetlands mitigation ratio for Area 1 will be determined during the RD phase of the project. During the RD, an evaluation of the functionality and extent of wetlands in Areas 1 and 3 will be conducted for mitigation planning purposes. The final mitigation ratio and amount of mitigation will also be determined at that time based on the location and type of wetlands (preferably in-kind with no net destruction of habitat value) (BEI 2006).

5. **Comment:** **The scope of Site 1 should include sediments that are immediately adjacent to the landfill, for these potentially contain contaminants from past migration from the landfill. Offshore sediments are currently being addressed by the regional sediment work group and were not addressed in the Site 1 FS Report.**

RESPONSES TO COMMENTS FROM PETER STRAUSS (CONTINUED)

Response: Based on the results of extensive sampling of sediments from locations surrounding Alameda Point, the Navy and the regulatory agencies have identified IR Sites 17, 20, 24, and 29 as offshore sediment sites, which will be addressed separately from IR Site 1. IR Site 29 includes offshore contamination associated with the skeet range at IR Site 1. A ROD has been issued that determines that no action is necessary for offshore sediments (Navy 2005). The beach sampling data collected around IR Site 1 in 2005 are included in this remedial decision. Currently, a site investigation for western Bayside indicates that no further action is necessary (Arcadis BBL 2007).

6. **Comment:** **The groundwater plume to be treated needs a complete characterization before a final remedy is selected. Recent experience with the proposed remedy has indicated that the magnitude and location of contaminants are critical for successful implementation.**

Response: The Navy and the regulatory agencies have agreed that the plume has been adequately characterized to allow the selection of ISCO as the most suitable treatment technology for addressing the VOC plume area, as described in the FS report (BEI 2006). Further sampling of the groundwater plume will be conducted during the RD to determine operating parameters for the groundwater remediation system. The Navy has adopted this same approach basewide and has successfully treated VOC plumes at IR Sites 16 and 9.

7. **Comment:** **There is concern that the remedy may lead to the release of other contaminants, including radium and metals. The Plan should include a capture and monitoring system to be used when the groundwater is undergoing treatment so that excess oxidants and potentially released contaminants are not released beyond the treatment area. A network of "Guard wells" (i.e., extraction wells at the downstream boundary of the treatment zone) and "Sentinel Wells" (monitoring wells to ensure that the guard wells are capturing released contaminants) should be developed and included in the Plan.**

Response: Groundwater monitoring will be conducted as part of the ISCO treatment technology included in the preferred remedial alternative (Alternative GW3). The monitoring wells placed around the perimeter of the VOC plume serve the same purpose and function as guard and sentinel wells. The ISCO treatment includes quarterly groundwater monitoring for treatment effectiveness and MNA sampling. The groundwater samples will provide information for areas upgradient, within, and downgradient of the treatment zone in the northern and southern portions of the plume.

RESPONSES TO COMMENTS FROM PETER STRAUSS (CONTINUED)

Additionally, wells cross-gradient of the treatment zone and outside the plume were included to determine if the plume is displaced during the treatment process. The effectiveness sampling program would include collection of samples from the five observation wells installed as part of the pilot-scale test and full-scale applications for analysis for metals, VOCs, semivolatile organic compounds (SVOC), and hydrogen peroxide. The MNA sampling program would include collection of samples from existing wells and new first water-bearing zone (FWBZ) wells for analysis for metals as well as for VOCs, SVOCs, and natural attenuation parameters. Under a pilot-scale test, samples will be collected from six observation wells and seven injectors for analysis to provide a baseline for COCs and metals that could be released from the aquifer matrix to groundwater by the ISCO process. Further details of the monitoring program will be determined during the RD. See the response to General Comment 7 in the Response to Comments from the RAB for a complete list of the groundwater monitoring ARARs for Site 1.

8. **Comment:** **I think that the Navy should not rely on Monitored Natural Attenuation (MNA) for a major role in the groundwater remedy, especially since there are DNAPLs in the groundwater plume. Although the FS indicates that there is breakdown of TCE into Dichloroethene (DCE) and vinyl chloride, the attenuation process often stalls at this point, with a buildup of vinyl chloride, which is probably more toxic than TCE. Realizing that the proposed remedy removes some of the source through ISCO, I believe that the Navy must have an objective that at least 75 percent of the reduction takes place through biological or chemical destruction, not through dispersal and diffusion.**

Response: The proposed groundwater alternative will rely most heavily on active ISCO to reduce a significant mass of contaminant concentrations, which is assumed to approach 80 percent concentration reduction in the FS report (BEI 2006, p. 6-13). MNA would be used as a secondary treatment to reduce residual concentrations of some contaminants to below the groundwater remediation goals stated in the PP. At Alameda Point, ISCO has been successful at treating the types of VOCs encountered at Site 1.

9. **Comment:** **I recommend that along with ISCO, enhanced in-situ biological remediation be retained, especially if monitoring downstream indicates that there are still high levels of vinyl chloride.**

Response: ISCO has been successful at other sites at Alameda Point, and it is also expected to be more effective than *in-situ* bioremediation (ISB) at

RESPONSES TO COMMENTS FROM PETER STRAUSS (CONTINUED)

reducing the toxicity, mobility, and volume of VOCs. ISCO is expected to chemically oxidize a wider range of chemicals than ISB. The ISCO system will not be terminated if high levels of vinyl chloride persist in groundwater. The Navy, with concurrence from the regulatory agencies, has selected ISCO along with MNA as the preferred alternative (Alternative GW3).

10. **Comment:** **There has not been a sufficient survey to identify special-status species. Habitat exists for a number of special status and rare and endangered species. There are rare and endangered and species of special status at Alameda Point, including but not limited to the Least Tern, the Alameda Song Sparrow, and possibly wetland and marsh species such as the Salt marsh harvest mouse and the Salt marsh wandering shrew, the Great Blue Heron, and the Clapper Rail. These species are often risk drivers at wetland and marsh sites.**

Response: The Navy has conducted several studies for special-status species at Alameda Point. Based on these studies and surveys, the Navy prepared a biological assessment that was used to support a consultation with the U.S. Fish and Wildlife Service in accordance with the Endangered Species Act. No special-status species or their habitats have been identified at IR Site 1 (Navy and Tetra Tech, Inc. 1997). A large portion of IR Site 1 is covered by paved runway surfaces, and the remaining area is primarily covered by nonnative annual grassland. No special-status species have been encountered at IR Site 1. Additionally, it is unlikely that they will occur at the site because of historical use and disturbances. Seasonal wetlands are a habitat of concern at IR Site 1, and they would be addressed through a Tier 2 ecological risk assessment (ERA) or wetlands mitigation plan (WMP).

11. **Comment:** **Little attention is paid in the documents about how radionuclides and other chemicals can be mobilized by changing environmental conditions. If waste is left in place, in what is an unlined pit, it is incumbent upon the Navy to further investigate factors that would mobilize contaminants and determine a mechanism for monitoring environmental change.**

Response: The Navy has established a basewide groundwater monitoring program; the selected remedial action will also implement a robust monitoring program to monitor for changing environmental conditions. During sampling events, if environmental conditions are observed to be changing and radionuclides have been mobilized, data will be reviewed, and in

RESPONSES TO COMMENTS FROM PETER STRAUSS (CONTINUED)

compliance with the NCP, a determination will be made whether an ESD or ROD amendment is appropriate.

12. **Comment:** Under the Navy's recommended alternative for soil in Area 1a, radium would be left in place. I recommend that the Navy establish a low threshold level for wastes that are left.

Response: The Navy has developed response actions with input from and the concurrence of the Radiological Affairs Support Office (RASO), EPA, DTSC, and the Water Board with the purpose of satisfying ARARs and commonly accepted goals. The regulatory agencies and the Navy have determined that the response actions (TCRA Action Memorandum [Navy 2007]) and remedial actions selected in the ROD) are sufficient to meet ARARs and commonly accepted goals.

13. **Comment:** I recommend that the Navy adopt a cleanup level for human health risk that is equivalent to a one-in-one million excess cancer risks.

Response: Cleanup levels for human health are specified in the PP and are repeated in Table 8-1 of the ROD. The soil levels were calculated based on an incremental cancer risk of 10^{-6} , or "one in one million" in the FS report for IR Site 1 (BEI 2006). The development of the soil cleanup levels, referred to as "screening levels" in the FS report, are presented in detail in Appendix C of the FS report.

Groundwater "screening levels" were also calculated in the FS report and are described in Appendix C. The calculated levels were for the exposure pathway and chemicals of most concern, VOCs and SVOCs, and were based on a 10^{-6} incremental cancer risk. However, the Appendix C conclusion notes that these screening levels were not used as remedial goals in the FS because "other criteria evaluated in Section 3 of the revised FS Report were more conservative." This statement refers to the use of numerical water quality criteria promulgated in the California Toxics Rule. The footnotes to Table 8-1 of the ROD, "Remediation Goals for Human Receptors," provide additional detail on these criteria.

14. **Comment:** The risk assessment should include the latest information, including the 2006 finding by the National Academy of Sciences (NAS) that EPA's 2001 draft health risk assessment for TCE was valid.

Response: The risk assessment has not been updated to reflect the latest information from the National Academy of Sciences (NAS). Remedies selected in the

RESPONSES TO COMMENTS FROM PETER STRAUSS (CONTINUED)

CERCLA process are based on ARARS and to be considered (TBC) policies, regulations, guidance, or ordinances (Title 42 of the *United States Code* [USC] § 9621(d), Title 40 of the *Code of Federal Regulations* [CFR] 300.400). The NAS information does not qualify as a criterion TBC. As the reviewer notes, the allowable groundwater contamination standards and health risks for trichloroethylene (TCE) in air may change in the future based on reviews by NAS and others. The migration of contaminants from groundwater into buildings (groundwater vapor intrusion) is a relatively new consideration at sites where groundwater has been impacted by volatile chemicals. Groundwater vapor intrusion is a potential concern if a complete exposure pathway exists. Factors to consider include identification of chemicals in groundwater of sufficient volatility and toxicity, and the presence of inhabited buildings (or the potential for future buildings) near subsurface contamination (in general, within 100 feet). At Site 1, as indicated in Section 12.2.1.2 of the ROD, under restricted activities, construction of buildings above the VOC plume is prohibited without prior approval from the Navy and DTSC. A complete pathway will not exist under the preferred remedy. In addition, the Navy plans on actively treating the VOC plume using ISCO followed by MNA. TCE concentrations are anticipated to decrease significantly. The protectiveness of the remedy, including the prohibition of buildings above the plume, will be re-evaluated during the FYR. The regulatory agencies have concurred with the selected active remediation remedy of ISCO and MNA for the groundwater plume. Federal and state regulatory agencies have agreed with the Navy that the information used in the risk assessment is acceptable.

15. Comment: **It is my opinion that if waste is going to remain in place, an engineered cap that limits water infiltration is necessary.**

Response: Please see the response to ARRA General Comment 3.

16. Comment: **The cap design should include a bio-barrier to prevent burrowing animals.**

Response: The minimum thickness (4 feet) of the soil cover is sufficient to prevent any burrowing animals from penetrating the cover. The details of the 4-foot-thick soil cover will be addressed during the RD. The Navy will design the soil cover to comply with all ARARs. The Navy will establish an inspection program for the soil cover that includes an annual report to be submitted to the regulatory agencies documenting the results of the post-construction inspection program and any follow-on maintenance activities. In addition, FYRs will be performed.

RESPONSES TO COMMENTS FROM PETER STRAUSS (CONTINUED)

17. **Comment:** It is unclear whether the Navy has considered the re-use plan for golf course in its remedial design. The golf course would impose additional structural parameters in the case of a seismic event, and would require a great deal of irrigation water that would infiltrate the cap. Both of these elements need to be looked at in the cap /cover design.

Response: This comment is noted. During the RD, the Navy will consider EPA's guidance document for reusing cleaned up Superfund sites and installing golf facilities (EPA 2003). The Navy will design the 4-foot-thick soil cover to meet EPA's guidance for cover soil design and consider, to the extent applicable in preparing this cover soil design, drainage and cover soil stability for seismic events. Under CERCLA, the Navy's obligation is to protect the cover. Further consideration beyond the design of the soil cover as an effective remedy, such as golf course design issues that do not affect the effectiveness (location of fairways, roughs, and greens), would be the responsibility of the golf course reuse organization.

18. **Comment:** It is worth considering that climate change is expected to cause sea levels to rise by approximately 3 feet over the next 100 years. All proposed remedies that are adjacent to the Bay should take this into consideration.

Response: The CERCLA remedial process includes an FYR process for the duration of the ICs. The FYR process includes assessing if any other information has come to light that could call into question the protectiveness of the remedy (EPA 2001). If climate change becomes a relevant factor for the protectiveness of the remedy, the CERCLA process would require its consideration.

19. **Comment:** I agree that State Water Resource Control Board Resolution (SWRCB) 68-16 (i.e., the non-degradation policy) and SWRCB Resolution 92-49 apply to groundwater at this site.

Response: This comment is noted. The State agrees that the proposed action would comply with State Water Resources Control Board (SWRCB) Resolution (Res.) 92-49 and Res. 68-16, and compliance with Cal. Code Regs. tit. 22 provisions should result in compliance with Cal. Code Regs. tit. 23 provisions. The State does not agree with the Navy determination that SWRCB Res. 92-49 and Res. 68-16 and certain provisions under Cal. Code Regs. tit. 23, div. 3, ch. 15, are not ARARs for this response action. SWRCB has interpreted the term "discharges" in the California Water Code to include the movement of waste from soils to groundwater and from contaminated to uncontaminated water (SWRCB 1994). The State

RESPONSES TO COMMENTS FROM PETER STRAUSS (CONTINUED)

does not intend to dispute the ROD but reserves its rights if implementation of the Cal. Code Regs. tit. 22 provisions is not as stringent as State implementation of Cal. Code Regs. tit. 23 provisions. Because the Cal. Code Regs. tit. 22 regulation is part of the State's authorized hazardous waste control program, it is also the State's position that Cal. Code Regs. tit. 22, § 66264.94 is a State ARAR and not a federal ARAR (United States v. State of Colorado, 990 F.2d 1565, 1993).

Because the Navy and the State of California have not agreed on whether SWRCB Res. 92-49 and Res. 68-16 and Cal. Code Regs. tit. 23, § 2550.4 are ARARs for this response action, the ROD documents each party's positions on the resolutions but does not attempt to resolve the issues.

20. Comment: **It is crucial that the Plan state who will be responsible for maintaining the stability and performance of the cap once a golf course is put in place.**

Response: The maintenance of the 4-foot-thick soil cover will be included with other IC objectives for the remedial actions at the site. The Navy will be responsible for implementing, maintaining, inspecting, reporting, and enforcing the IC objectives described in the ROD in accordance with the future RD reports. Although the Navy may later transfer these procedural responsibilities to another party by contract, property transfer agreement, or other means, the Navy shall retain ultimate responsibility for remedy integrity. If any of the IC objectives fail, the Navy shall ensure that appropriate actions are taken to re-establish the protectiveness of the remedy and may initiate legal action to either compel action by a third party(ies) and/or recover the Navy's costs for mitigating any discovered IC violation(s).

21. Comment: **This is the most confusing Proposed Plan that I have read, and I think it would be helpful for all concerned that a better explanation of the Site 1 proposed remedy be rewritten.**

Response: The Navy acknowledges that describing remedial actions for multiple media (soil and groundwater) at as many as five individual sites in a necessarily brief document can lead to confusion. The Navy has used the ROD to provide a more detailed and organized discussion of the proposed remedy while at the same time meeting CERCLA and NCP requirements.

RESPONSES TO COMMENTS FROM PETER STRAUSS (CONTINUED)

SPECIFIC COMMENTS IN ATTACHMENT

Data Gaps

1. **Comment:** The resolution of many data gaps is not addressed in the proposed plan; instead, they are planned for the remedial design stage. In 2004, the Environmental Protection Agency (EPA) Remedial Project Manager (RPM) expressed frustration with the lack of data used in the Remedial Investigation/Feasibility Study (RI/FS). He expressed concern that the lack of information could compromise the ability of stakeholders to select a final alternative. If an alternative was selected that relied on extensive data collection during remedial design to verify assumptions, he cautioned that time-consuming Record of Decision (ROD) amendments could potentially be required. It is my opinion that each of the data gaps should be resolved before a final plan is completed. These include:
 1. Delineation of Trichloroethene (TCE) in groundwater at the north end of Site 1, adjacent to the inner harbor. The lateral extent of TCE in this area has not been defined. The FS reported that this will be investigated as part of the remedial design phase; however, it may be investigated sooner. At this time, we don't know if this analysis was completed and whether there will be additional groundwater remediation required.
 2. Analysis for 1,4-dioxane in groundwater using lower detection limit. 1,4-dioxane is a solvent stabilizer that was added to Trichloroethane (TCA) and other solvents. The groundwater analysis used a high detection limit so that this contaminant was not fully characterized. Information about the presence of 1,4-dioxane in groundwater in the plume area will be available during the remedial design phase of the project. Yet, it is not clear whether the In-Situ Chemical Oxidation (ISCO) process fully works on this chemical.
 3. Analysis of groundwater in the burn area for dioxins/furans. At the latest, groundwater samples will be collected during the remedial design phase from the monitoring wells in the burn area and analyzed for dioxins and furans. The presence of dioxins and furans will be an important consideration on how this area is remediated.
 4. Analysis for explosive constituents in groundwater. Analysis of groundwater samples for constituents indicative of ordnance in first water-bearing zone (FWBZ) groundwater will be conducted during the remedial design phase of the project. Again, a

RESPONSES TO COMMENTS FROM PETER STRAUSS (CONTINUED)

treatment system for constituents indicative of explosives may require different treatment than ISCO.

5. Radiological survey of the riprap slope areas. Information about the presence of radium-impacted waste in the shoreline areas will be available during the remedial design phase of the project. This is a major concern for human and ecological health and may affect the scope of the remedy, and lead to further investigation whether radium has made its way into the Bay.
6. Assessment of residual impacts in the waste disposal area. Installation of four interior and/or perimeter wells has been included in all the active groundwater remedial alternatives. Groundwater data from these wells will be available during the remedial design phase of the project and will be used to evaluate groundwater quality in the waste disposal area and assess whether drummed liquids were disposed of at Site 1. One of the concerns is that there are drummed wastes in the landfill, which may require spot excavation. Covering it with a cap before this is known is premature.
7. Ecological risk assessment (ERA) for unpaved areas of Site 1 outside the disposal area. An ERA of the unpaved interior areas of Site 1 will be performed as part of the remedial alternatives for soil in Area 3. The ERA will be conducted during the remedial design stage of the project and the results of the ERA will be used to determine the extent of the hot spot removals in Area 3.
8. Wetlands evaluation. An evaluation of the functionality and extent of wetlands in Areas 1 and 3 will be conducted during the remedial design stage for mitigation planning purposes. The final mitigation ratio and amount of mitigation will also be determined at that time based on the location and type of wetlands. Again, this determination should be part of the proposed plan and vetted before the public.
9. Geophysical surveys. Geophysical surveys would be conducted to assess the limits of buried waste and the proximity of waste to the San Francisco Bay under preferred alternatives S1-4 and S5-4. This clearly is a characterization activity, and proposals or areas affected require this information prior to remedy selection. Additionally, depending on the results of the buried waste delineation activities, the recommended geotechnical remedy (3,000-foot-long soil cement gravity wall and stone columns) may not be the most feasible and cost-effective geotechnical remedy for Site 1.

RESPONSES TO COMMENTS FROM PETER STRAUSS (CONTINUED)

Response: In 2006, the regulatory agencies, including the EPA Remedial Project Manager (RPM), approved the Site 1 PP, indicating that the frustrations expressed by the EPA RPM in 2004 have been resolved to a level that allowed remedy selection. All of the regulatory agencies have accepted the Navy's approach to resolve issues during the RD. The Navy believes that enough information and data have been gathered to make an appropriate remedial decision, and both the Navy and regulatory agencies concur with the proposed remedy.

The responses below address the individual issues identified in this comment.

1. The Navy has not completed any additional delineation of the TCE plume at this time. The Navy still intends to refine the plume extent during the RD.
2. EPA has recently published an engineering issues paper on ISCO (Huling and Pivetz 2006). This paper assesses the amenability of treatment using different contaminants and contaminant classes, including 1,4-dioxane. The assessment indicates that the amenability of treatment of 1,4-dioxane using ISCO with Fenton's reagent is excellent. There is little risk in deferring additional characterization of 1,4-dioxane in groundwater at IR Site 1.
3. This comment is noted. If dioxins and furans are detected in groundwater during removal of the burn area, the Navy will evaluate the data in coordination with the Base Realignment and Closure (BRAC) Cleanup Team (BCT) to determine the need for additional action, if any, to resolve the issue. Please see the response to comments from the RAB, General Comment 3 in Cover Letter.
4. The EPA engineering issues paper on ISCO also evaluates explosives (Huling and Pivetz 2006). The paper concludes that the amenability of explosives (as a class of contaminants) to oxidation transformations is good to excellent using ISCO.
5. The radiological characterization survey was completed in November 2006 and included the shoreline and riprap areas of IR Site 1. All data gathered during this survey have been included in the TCRA for IR Sites 1, 2, and 32 that is currently underway.
6. Anecdotal evidence based on interviews with personnel that worked at the naval air station shows that drums disposed of at IR Site 1 were commonly crushed by equipment during disposal. In addition, as stated previously, disposal operations at IR Site 1 ceased approximately 50 years ago. Much of the material disposed of at IR

RESPONSES TO COMMENTS FROM PETER STRAUSS (CONTINUED)

Site 1 is buried beneath the groundwater table. It is improbable that a drum buried in the disposal area would still remain intact after 50 years. Consequently, the Navy believes that the groundwater monitoring well network will provide adequate warning should the postulated scenario occur.

7. The reviewer is correct; the Navy intends to use the results of the ERA to determine the extent of the area to be excavated based on potential risk to ecological receptors.
8. The Navy disagrees and believe that it is not necessary to include the actual mitigation ratio in the PP. A detailed wetlands mitigation plan will be developed during the RD and remedial action work plan phases.
9. As the reviewer notes, for Soil Alternative S1-4a, the spatial limits of buried waste and the proximity of waste to San Francisco Bay will be assessed using geophysical surveys and test borings. Surveys and borings will focus on identifying limits and not on characterizing the chemical composition of the waste, which is consistent with EPA's specific CERCLA military landfill (EPA 1996) and municipal landfill (EPA 1993) presumptive remedy guidance. The Navy intends to conduct confirmation and not characterization sampling for Soil Alternative S5-4. Confirmation sampling would confirm that chemical concentrations meet sediment screening criteria for wetlands cover soil to protect human health and the environment. Because Areas 5a and 5b are outside the former waste disposal area, confirmation sampling results are expected to lead to the conclusion that no significant human health or ecological effects are posed by Areas 5a and 5b that would require further action. Also, please note that the PP does not specify seismic design criteria because these criteria will be addressed and detailed during the RD phase. It is incorrect to identify these structures as part of the preferred alternative. Instead, the Navy has committed to ensuring that the selected remedies are designed to meet ARARs, which include current seismic and geotechnical ARARs.

Scope

2. **Comment:** The proposed plan covers Site 1 but not the contamination that potentially has emanated from Site 1 into the Bay and the inner harbor. The FS and responses to comments on the FS all point out that the waste has been sitting in groundwater for some time, and much of it has probably been sorbed or has washed into the bay. During the mid-1990s, sediment samples were taken and at that time,

RESPONSES TO COMMENTS FROM PETER STRAUSS (CONTINUED)

the Navy determined that results were expected for ambient concentrations in the San Francisco Bay and unlikely to pose an increased health or ecological risk relative to the rest of the bay. Offshore sediments are currently being addressed by the regional sediment work group and are therefore not addressed in the Site 1 FS Report. Due to advances in the science of ecological risk and estimates of “ambient levels”, this statement is no longer valid. The low tidal areas adjacent to Site 1 should be included in the scope of this plan, or an amendment to the plan.

Response: The Navy and the regulatory agencies identified a number of offshore IR sites around Alameda Point based on the analytical results associated with extensive sampling of offshore sediments. The sites include IR Site 17, Seaplane Lagoon; Site 20, Oakland Inner Harbor; Site 24, Pier Area; and Site 29, Skeet Range. In 2005, samples were collected in the former burn area and proposed future public area to supplement previous data collected at Site 1 (Battelle 2005a). The Navy and the regulatory agencies signed a No Action ROD for IR Site 29, which is located offshore of IR Site 1, on September 21, 2005 (Battelle 2005b). This ROD was supported by the historical data referenced by the reviewer and was supplemented by data collected over several recent years. The evaluation conducted using these data concludes that historical activities at the Skeet Range did not have a significant effect on ecological receptors in San Francisco Bay. Therefore, the No Action ROD was warranted. The Navy has determined that the existing data and evidence are sufficient to invalidate the contention that “advances in the science of ecological risk and estimates of ‘ambient levels’...” would negate the previous evaluations or require additional consideration of tidal areas adjacent to IR Site 1.

Groundwater

3. **Comment:** **In-situ Chemical Oxidation (ISCO) works if the oxidizing agent comes into contact with the contaminant. Whether or not ISCO will work at the particular site depends on the soil/geology of that location, the source area characteristics and how well the VOC plume is characterized. Yet, the characterization of the VOC plume is incomplete, as shown on Figure 4 of the Proposed Plan. A recent experience with ISCO in Rhode Island has proven ineffective, probably because the magnitude of contamination was not yet fully understood.**

Response: The plume is adequately characterized regarding its composition. However, further definition of the extent of contamination is needed. The

RESPONSES TO COMMENTS FROM PETER STRAUSS (CONTINUED)

extent of contamination will not affect the success of ISCO. Based on the Navy's experience at other sites at Alameda Point, ISCO will successfully treat VOCs in the plume at IR Site 1. Please also see the responses to Comments 6 and 8 above in RAB Major Comments in Cover Letter.

4. **Comment:** The common oxidants are hydrogen peroxide-based Fenton's Reagent, and potassium manganate (KMnO_4), better known as permanganate. Fenton's Reagent is produced on site by adding an iron catalyst to a hydrogen peroxide solution, and works best with a pH adjustment. The Regional Water Quality Control Board (RWQCB) RPM expressed concern that ISCO may cause the release of other contaminants now stabilized in the landfill (metals). The most common oxidant delivery method involves the injection of oxidants, and the targeted delivery of oxidants to the contaminant zones may require both injection and extraction wells. The Proposed plan must make clear that it will capture the oxidants if there is a release of other contaminants. This will also require frequent sampling downstream after initial injection.

Response: The preferred remedial alternative (GW3) includes effectiveness monitoring during the treatment process, MNA, and long-term monitoring of groundwater. The specific details of the monitoring plan will be developed during the RD. Also, please see the response to Comment 7 in RAB Major Comments in Cover Letter.

5. **Comment:** In a related point, the selection of the oxidizing agent should preclude activation or release of other contaminants (such as Radium-226) that may be trapped in the saturated and vadose zones. The Proposed Plan should indicate if this is a potential problem, and what would be done to mitigate it. Since the Radiological investigation only characterized surface anomalies, it is not certain whether parts of the area that are scheduled for ISCO would have radionuclides below the two foot depth.

Response: Please see the response to Specific Comment 4 above. The RD will identify necessary criteria for the groundwater monitoring program and will comply with the groundwater monitoring ARARs identified above in the response to General Comment 7 in the Response to Comments from the RAB and in Section 13.2.3.7 of the ROD. The active treatment remedy (ISCO) includes effectiveness groundwater monitoring throughout the treatment period. Effectiveness monitoring will target chemicals that exceed remediation goals and other chemicals, as appropriate, that may result from the ISCO treatment process.

RESPONSES TO COMMENTS FROM PETER STRAUSS (CONTINUED)

6. **Comment:** The plan should include a capture and monitoring system to be used when the groundwater is undergoing treatment so that excess oxidants and potentially released contaminants are not released beyond the treatment area. A network of “Guard wells” (i.e., extraction wells at the downstream boundary of the treatment zone) and “Sentinel Wells” (monitoring wells to ensure that the guard wells are capturing released contaminants) should be developed and included in the plan.

Response: Please see the response to Major Comment 7 in RAB Major Comments in Cover Letter above.

7. **Comment:** I was struck by the somewhat lenient groundwater cleanup goals. The remediation goal for vinyl chloride, a known carcinogen, is three orders of magnitude greater than the drinking water standard; TCE is an order of magnitude higher than the drinking water standard. Although it is acknowledged by the regulators that the groundwater is a not potential drinking water source, these high contaminant levels are of concern as they make their way to the bay. It is important to note that a dispute exists between the RWQCB and the Navy over whether it must comply with California’s non-degradation policy (SWRB 68-16 and 92-49), which has as one of its objectives limiting polluted waters from contaminating less polluted waters. Additionally, as the groundwater is shallow and flows just under the “sandy beach”, vapors from the underlying shallow groundwater may be released. In particular, vinyl chloride vapors should be assessed using the most recent scientific information.

Response: The beneficial use of groundwater is not for municipal or drinking water use. Thus, the remediation goals reflect the absence of human exposures from drinking or otherwise using groundwater beneath IR Site 1. The human receptor remedial goals are protective of the most conservative expected future land-use exposure pathway: ingestion of VOCs and SVOCs by people who fish recreationally. As explained in the FS report, volatilization of vinyl chloride from groundwater to the ambient air was assessed and a risk-based screening level developed. However, more conservative remedial goals for vinyl chloride, as well as other VOCs and SVOCs, have been selected from the numerical criteria promulgated in the “California Toxics Rule” (40 CFR § 131.38) and implemented in the new enclosed bays and estuaries plan as a part of the water quality control plan for the San Francisco Bay ([Basin Plan] SWRCB 2000). These plans represent the most current promulgated criteria that specifically protect the water quality on and around Site 1.

RESPONSES TO COMMENTS FROM PETER STRAUSS (CONTINUED)

8. **Comment:** I think it is important that the Navy does not rely on Monitored Natural Attenuation (MNA) for a major role in the groundwater remedy. Public stakeholders at many sites view “natural attenuation” with skepticism and some view it as a do nothing approach. Although the FS indicates that there is breakdown of TCE into Dichloroethene (DCE) and vinyl chloride, the attenuation process often stalls at this point, with a buildup of vinyl chloride, which is probably more toxic than TCE. Realizing that the proposed remedy removes some of the source through ISCO, I believe that the Navy must have an objective that at least 75 percent of the reduction takes place through biological or chemical destruction, not through dispersal and diffusion. This may be achievable, as the FS points out that ISCO at the Naval Weapons Station Seal Beach reduced VOCs by 80%.

Response: Please see the response to Major Comment 8 above in RAB Major Comments in Cover Letter.

9. **Comment:** The high level of DCE in groundwater (3,900 ppb) and vinyl chloride (9,400 ppb) west of the former engine parts storage and cleaning area is probably the result of natural breakdown of TCE. It supports the conclusion that some attenuation is occurring; however, vinyl chloride is more persistent, more mobile, and more toxic than its parent products (e.g., TCE). This “line of evidence” to demonstrate that natural attenuation is occurring is not sufficient by itself to persuade agencies that that MNA will continue to work as a remedy. EPA puts the burden of proof on the party that proposes natural attenuation as a cleanup remedy, and requires “multiple “lines of evidence”. While natural attenuation in general has both advantages and disadvantages, the proponent must present convincing site-specific technical evidence that natural attenuation will effectively protect human health and the environment and, furthermore, that it will achieve remedial objectives within a reasonable time frame. Project proponents must demonstrate that human or environmental receptors will not be exposed to greater risks during the long natural attenuation process.

Response: This comment is noted. The proposed groundwater alternative will rely most heavily on active ISCO to reduce a significant mass of contaminant concentrations, which has been assumed to approach 80 percent concentration reduction in the FS report (BEI 2006, p. 6-13). MNA would be used as a secondary treatment to reduce residual concentrations of some contaminants to below the groundwater remediation goals stated in the PP. MNA is anticipated to continue for 3 years after ISCO treatment.

RESPONSES TO COMMENTS FROM PETER STRAUSS (CONTINUED)

After MNA, long-term groundwater monitoring would be used to confirm that risks to human health and the environment are not posed by the COCs DCE, vinyl chloride, and TCE (BEI 2006, p. 6-13). In developing the MNA approach in the FS, the Navy reviewed EPA's technical protocol for evaluating natural attenuation of chlorinated solvents in groundwater (EPA 1998) and EPA's directive on use of MNA at Superfund sites (EPA 1999).

10. **Comment:** **There is continued concern that ISCO is not effective at treating a large mass of volatile organic compounds (VOCs), such as is found in dense non-aqueous phase liquids (DNAPLs). Rebound, or the rise in contaminant levels after it was seemingly reduced, may be high if an appreciable DNAPL mass remains in the source zone and soil/groundwater. However, based on the literature, Fenton's Reagent is somewhat effective if it comes into contact with the DNAPL.**

Response: Please see the response to Major Comment 8 above in RAB Major Comments in Cover Letter.

11. **Comment:** **TCE, a common contaminant found in groundwater, is sold under about fifty different trade names. Some of these products contain additives used as stabilizers, which make up two to eight percent of the total weight. These stabilizers are numerous and they have not been considered when developing strategies for natural attenuation. For example, the most common stabilizer, 1,4-dioxane in TCA, does not readily attenuate, and is only going to be looked at in the remedial design phase. The matter of stabilizers, particularly 1,4-dioxane, should be analyzed as soon as possible, as it may lead to a different remedial strategy for groundwater.**

Response: Based on Thomas K.G. Mohr's white paper entitled "Solvent Stabilizers, White Paper," stabilizers were not commonly used during the time waste was disposed of at IR Site 1 (Mohr 2001). Therefore, it is highly unlikely that stabilizers, including 1,4-dioxane, are unknowingly persisting at IR Site 1. Additionally, characterization of the extent of 1,4-dioxane will be addressed along with the other groundwater data gaps during the RD.

12. **Comment:** **I recommend that along with ISCO, enhanced in-situ biological remediation be retained, especially if monitoring downstream indicates that there are still high levels of vinyl chloride.**

Response: Please see the response to Major Comment 9 above in RAB Major Comments in Cover Letter.

RESPONSES TO COMMENTS FROM PETER STRAUSS (CONTINUED)

Response: Please see the response to Major Comment 10 above in RAB Major Comments in Cover Letter.

- 15. Comment:** Given that we know that there are rare and endangered and species of special status at Alameda Point, including but not limited to the Least Tern, the Alameda Song Sparrow, and possibly wetland and marsh species such as the Salt marsh harvest mouse and the Salt marsh wandering shrew, as well as species of special status, including the Great Blue Heron, and the Clapper Rail, these species should be considered in risk calculations. Below I have included a Table for cleanup goals for those species at Moffett Field, under a salt marsh scenario.

		Lead (mg/kg)	Zinc (mg/kg)	DDT (µg/kg)	PCB (µg/kg)
Alameda Song Sparrow	TRVhigh	93.8	518	251	881
	TRVlow	0.24	51.8	1.17	72.7
Clapper Rail	TRVhigh	202	886	356	1,574
	TRVlow	0.51	88.6	1.66	130
Great Blue	TRVhigh	209	803	109	2,856
	TRVlow	0.53	80.3	0.51	236
Salt Marsh Wandering Shrew	TRVhigh	1,416	314	513	210
	TRVlow	0.01	6.5	25.6	59

Note: Numbers in **bold** are risk drivers

µg/kg Micrograms per kilogram
 mg/kg Milligrams per kilogram TRV

Response: Please see the response to Major Comment 10 above in RAB Major Comments in Cover Letter.

- 16. Comment:** It is important to note that polychlorinated biphenyls (PCBs), lead and cadmium were found in soils that are part of the seasonal wetlands. The seasonal wetlands provide rest, shelter, and forage for Canada geese and other migratory water fowl, as well as for raptors. Some of the marsh species may occupy those sites during part of the year. Identification of those species is a necessary step before soil cleanup goals should be adopted for soils within the seasonal wetlands. Special status species and some marsh species should be included in any revised ERA.

Response: This comment is noted. For the special-status species survey, please see the response to RAB General Comment 6, item 6, above in Responses to

RESPONSES TO COMMENTS FROM PETER STRAUSS (CONTINUED)

Comments from the RAB. To confirm that the seasonal wetlands have not been significantly degraded, preferred Soil Alternative S3-4 will include a Tier 2 ERA. Soil Alternative S3-4 also will include removal of soil with chemical concentrations exceeding remediation goals and ICs to establish soil management requirements.

17. **Comment:** VOCs and benzene are groundwater contaminants that underlie SW1 (i.e., seasonal wetland 1). It is important that any overlap of the wetlands and these plumes are fully characterized for eco-risk, including sediment and vapor transport.

Response: A large part of seasonal wetland 1 overlaps the VOC plume, which will undergo active remediation to remediate groundwater chemicals (including VOCs and benzene) and greatly reduce any risk.

18. **Comment:** Some of the wetlands will be affected or destroyed by the remedies, requiring the Navy to mitigate the wetlands. Most often this is done on at least a 2:1 ratio because creating a new wetland is difficult and often fails. The Navy has failed to commit to a mitigation ratio, and I recommend that it do so in the proposed plan.

Response: Please see the response to Major Comment 4 above in RAB Major Comments in Cover Letter.

Radiological Characterization and Cleanup

19. **Comment:** Albeit that radiological characterization is difficult and only detected near-surface anomalies, it is important to point out that little attention is paid in the documents about to how radionuclides (radium, strontium₉₀, and perhaps medical wastes that were disposed of from Oak Knoll Naval Hospital) can be mobilized by changing environmental conditions, as is pointed out in the concern about using an acidic oxidizer like Fenton's Reagent. Because this landfill is an unlined pit, it is incumbent upon the Navy to further investigate factors that would mobilize contaminants and determine a mechanism for monitoring environmental change and ensuring that radionuclides will not be transported in the future.

Response: See the response to Major Comment 11 above in RAB Major Comments in Cover Letter. Although the Navy does not anticipate mobilization of radionuclides, the Navy has committed to continue long-term monitoring

RESPONSES TO COMMENTS FROM PETER STRAUSS (CONTINUED)

for these materials as part of the groundwater remedy to determine if they are transported from the site by groundwater.

20. **Comment:** As is noted in the Final Radiological Characterization Report “[O]ther naval installations, including Oak Knoll Naval Hospital, Naval Supply Center Oakland, and Treasure Island, also used the site for waste disposal.” It is not clear whether any of these facilities also may have disposed of low level radioactive waste at Site 1, but a full record of what other wastes have been disposed of at Alameda Point should be fully investigated. There has been extensive information generated about disposal activities of radioactive waste at three other Bay Area Naval facilities (Hunter’s Point, Treasure Island and Mare Island). For example, records were declassified in 2001 for the Naval Radiological Defense Laboratory, which was located at Hunter’s Point Naval Shipyard. It is not clear from the background information in the RI/FS whether this information was reviewed to determine other sources of radioactive materials at Site 1.

Response: Numerous studies cataloging the extent of elevated levels of radium have been conducted. In 2005, a comprehensive surface radiological survey of IR Site 1 was conducted whereby 100 percent of IR Site 1 was covered. The radiological survey results showed that most of the surface radiological anomalies reside within the former waste disposal area (Area 1), which will be addressed by the preferred remedial alternatives (Tetra Tech, FW Inc. 2005).

The Navy has prepared a historical radiological assessment report that has been reviewed by the BCT (Weston Solutions, Inc. [Weston] 2006). Extensive research into the use of radiological materials at Alameda Point was conducted involving extensive record reviews along with personal interviews of individuals that may have knowledge of their use at Alameda Point. The historical radiological assessment report should provide the best possible history of the use and disposal of radiological materials at IR Site 1.

21. **Comment:** All radium-impacted waste in Areas 1b, 3 and 5 exceeding 4,000 counts per minute (cpm) above background would be removed, as described for Alternative S6-4. Area 1b and wastes that are near a suspected former radiological disposal trench contain all radium-impacted waste exceeding 200,000 cpm that would be removed. The remainder of radium in Area 1a would be left in place. There appears that there is no threshold value given for radium contaminated wastes that are going to be left in Area 1a. I recommend that the Navy establish a threshold level for wastes which will remain on site.

RESPONSES TO COMMENTS FROM PETER STRAUSS (CONTINUED)

Response: Please see the response to Major Comment 12 above in RAB Major Comments in Cover Letter. All contaminated materials left in place would be under the protection of the 4-foot-thick soil cover, which has been determined to be sufficiently protective of human health by removing the exposure pathway. An evaluation of potential external exposure from the remaining radiological anomalies is provided in Appendix A of the FS report (BEI 2006). ICs would be implemented in conjunction with an Area 1a cover remedy to ensure that the integrity of the soil cover is maintained and effectiveness is protected.

22. Comment: **The Navy needs to establish a protocol for removal of radioactive substances and confirmation sampling. Specifically, when radioactive substances are encountered, it will be important to know how much waste and surrounding soil will be removed. For example, if a radioactive dial is encountered, how much soil around and beneath the dial will be removed? Also, please identify what type of confirmation/verification sampling will be conducted to ensure that soil left in place is clean. It is recommended that as the Navy begins excavation of any radioactive material, it confirm that the area is clean using the high-purity germanium detector (HPGe), along with confirmation samples that are sent to the laboratory for gamma spectroscopy.**

Response: When an area of elevated gamma readings is identified, the elevated area will be removed along with the surrounding soil to a depth of 1 foot in all directions. Once soil is removed, the area will be rescanned with a sodium iodide (NaI) 2-inch by 2-inch detector and a soil sample will be collected for gamma spectroscopy analysis using a High-purity Germanium (HPGe) detector.

23. Comment: **The field survey of radiological waste was done with using a sodium-iodide (NaI) detector, and confirmed with an HPGe detector. Both detect gamma rays. HPGe detectors are “favored when definitive spectroscopic measurements are needed.” (Technology Overview: Real Time Measurement of Radionuclides in Soil: Technology and Case Studies, Interstate Technology and Regulatory Council, February, 2006). Citing recent experience at the Fernald uranium processing facility in Ohio, the Department of Energy (DOE) recommended using the HPGe detector for Radium-226, which is a weak gamma emitter (i.e., alpha and beta are not picked up by either detector). An example of the different sensitivity (i.e., detection limits) of the two detectors is shown in the Table below.**

RESPONSES TO COMMENTS FROM PETER STRAUSS (CONTINUED)

COC	Fernald Action Limit (pCi/g)	Minimum Detectable Concentration (pCi/g)	
		HPGe	Nal
Uranium	55	1.9	78
Ra-226	1.5	0.075	1.1

Note:
pCi/g Pico Curies per gram

Response: During the 2004 characterization and the follow-on data gaps survey, a HPGe detector was used to provide *in-situ* gamma spectroscopy measurements to help determine the types of radionuclides present at the locations where elevated counts were noted. A sample was collected and sent to a laboratory, where a HPGe detector was used to determine actual soil concentrations. A similar process will be used during the removal of soils with elevated radionuclide concentrations. A sample will be required to obtain radionuclide-specific soil concentrations. Once removals are completed, a surface scan using an Nal 2-inch by 2-inch probe will be taken and samples will be collected from the location where remediation has occurred. These samples will be forwarded to a laboratory for analysis to confirm the actual soil concentrations using a gamma spectroscopy system with an HPGe detector.

Burn Area

24. Comment: For Area 1b, excavation activities are assumed to extend into groundwater, requiring a dewatering and sediment filtration system. Extracted groundwater is assumed to require treatment for removal of dissolved heavy metals and VOCs. A temporary treatment system would be brought on-site and operated with an ion exchange for metals removal and granular activated carbon (GAC) for VOC removal. The system is assumed to operate at 100 gallons per minute during excavation, and to discharge to the San Francisco Bay. Dewatering would require planning, treatment system oversight, and a sampling program for the duration of the dewatering program. Note that dioxins/furans are still being investigated; yet it is not clear whether GAC would be appropriate to remove these contaminants from the waste stream. This element of the remedy should be discussed in the proposed plan. More importantly, it suggests that almost all groundwater underlying Area 1 is contaminated with heavy metals and VOCs. Again, I can only conclude that contaminated groundwater and leachate are making their way to the Bay.

RESPONSES TO COMMENTS FROM PETER STRAUSS (CONTINUED)

Response: Please see the response to Comments from the RAB, General Comment 6, items 5 and 8, and the response to Comments from the RAB, Specific Comments in Attachment, Comment 1, item 3, above. The Navy's approach (provided in the PP) addresses dewatering and sediment filtration activities associated with the proposed remedy. These activities are mentioned to address all possible (however unlikely) events that may occur. If dewatering and sediment filtration activities occur, the Navy will properly dispose of any sediment or groundwater. It should be noted that the details of the dewatering plan will be contingent on the investigation results for dioxins and furans.

The groundwater monitoring results summarized in the FS report (BEI 2006), the groundwater attenuation analysis summarized in the FS report (BEI 2006, Vol. 2, Appendix F), and the most recent basewide groundwater monitoring report for Spring 2006 (Innovative Technical Solutions, Inc. [ITSI] 2006) do not support the conclusion that contaminated groundwater and leachate are migrating to the Bay. The FS examined five rounds of basewide groundwater monitoring data (Winter 2003, Fall/Winter 2004, Summer 2004, Spring 2005, and Fall/Winter 2005). These groundwater monitoring data "did not indicate other contaminant groundwater plumes in the FWBZ outside of the VOC plume area with the exception of a possible TCE plume at well M002-A or in the SWBZ" (BEI 2006, p. 2-39). Specifically, for M002-A, the FS report later indicates, "Because the concentrations of the VOCs in well M002-A are below screening criteria and appear to be decreasing, this area was not evaluated for active remediation," and "The detections of VOCs at this well are declining or remain stable as indicated by the results of the basewide groundwater monitoring program" (BEI 2006, Vol. 2, Appendix G, DTSC-GSU, response to comments, p. 8).

The attenuation analysis in the FS report specifically examines the potential discharge of contaminated groundwater to waters of the Bay as the primary pathway for risk to the environment at IR Site 1. Outside the VOC plume area, the attenuation analysis suggests that there is not a significant source of contamination in the Area 1 subsurface wastes contributing to groundwater contamination outside the VOC plume area and that any California Toxic Rule exceedances are isolated both spatially and temporally. The FS report concludes that "based on the groundwater quality evaluation, groundwater in the FWBZ outside the VOC plume area and groundwater in the SWBZ area do not appear to warrant active remediation" (BEI 2006, Vol. 2, Appendix F).

RESPONSES TO COMMENTS FROM PETER STRAUSS (CONTINUED)

The most recent groundwater monitoring report from Spring 2006 does not indicate any changes in concentrations that would suggest movement of a plume (ITSI 2006). These temporal data from the past 4 years of basewide groundwater monitoring reports and the attenuation analysis do not support a conclusion of contaminated groundwater and leachate migration toward the Bay.

Human Risk

25. Comment: The National Contingency Plan [Section 300.430 (e)(2)(A)(2)] states that “For known or suspected carcinogens, acceptable exposure levels are generally concentration levels that represent an excess upper bound lifetime cancer risk to an individual of between 10^{-4} and 10^{-6} using information on the relationship between dose and response. The 10^{-6} risk level shall be used as the point of departure for determining remediation goals for alternatives when ARARs are not available or are not sufficiently protective because of the presence of multiple contaminants at a site or multiple pathways of exposure;”. I recommend that the Navy adopt the “point of departure” as its remedial goal.

Response: Please see the response to Specific Comment 13 in Major Comments to Cover Letter. Remedial goals for Site 1 were either based on the 10^{-6} incremental cancer risk level or more conservative numeric criteria (California Toxics Rule).

26. Comment: The risk assessment should include the latest information, including the 2006 finding by the National Academy of Sciences (NAS) that EPA’s 2001 draft health risk assessment for TCE and the Science Advisory Board’s review of the draft TCE Health Risk Assessment (<http://www.epa.gov/sab/pdf/ehc03002.pdf>). As such, I expect that allowable groundwater contamination standards and health risks for TCE in the air will change and be stricter in the future. TCE was only the first of many substances to be reviewed. I expect that the allowable standards for its daughter products (DCE and vinyl chloride) will also be reviewed and possibly changed. Although the effectiveness of remedies is evaluated in a Five Year Review, which includes changes in standards, it is important that the proposed remedy for groundwater take this new information into consideration. Most importantly, the question remains as to whether the proposed remedy can achieve those new standards.

In August 2001, U.S. EPA’s Office of Research and Development (ORD) released the draft Trichloroethylene Health Risk Assessment:

RESPONSES TO COMMENTS FROM PETER STRAUSS (CONTINUED)

Synthesis and Characterization (TCE Health Risk Assessment) for external peer review. The draft TCE Health Risk Assessment took into account recent scientific studies of the health risks posed by TCE. According to the draft TCE Health Risk Assessment, for those who have increased susceptibility and/or higher background exposures, TCE could pose a higher risk than previously considered. Standards for cleanup are expected to be even stricter than the preliminary remediation goal (PRG) for TCE (2.3 ppb). The Science Advisory Board, a team of outside experts convened by U.S. EPA, reviewed the draft TCE Health Risk Assessment in 2002, and concurred with the results. In 2003, Region IX promulgated a "provisional" PRG for air that was an order of 65 times stricter than had been applied prior to 2003. Both the Department of Defense and Department of Energy strongly objected and EPA backed off enforcement of the provisional PRG until NAS external review. This review was completed this year and concurred with the EPA Health Risk Assessment.

Additionally, California has a Public Health Goal (PHG) that should become a "To-Be-Considered" Applicable or Relevant and Appropriate Requirement (ARAR). For TCE in groundwater, the PHG was changed from 2.3 ppb to 0.8 ppb. This is assumed to be equivalent to an increased risk of 1 in a million excess lifetime cancers. This latter number was adopted by the Office of Environmental Health Hazard Assessment, and is in conformance with the State Implementation Plan.

Response: **Health Risks from TCE in Air.** As the reviewer notes, the allowable groundwater contamination standards and health risks for TCE in air may change in the future based on reviews by NAS and others. The migration of contaminants from groundwater into buildings (groundwater vapor intrusion) is a relatively new consideration at sites where groundwater has been impacted by volatile chemicals. Groundwater vapor intrusion is a potential concern only if a complete exposure pathway exists. Factors to consider in evaluating the pathway include identification of chemicals in groundwater of sufficient volatility and toxicity, and the presence of inhabited buildings (or the potential for future buildings) near subsurface contamination (in general, within 100 feet). At Site 1, as indicated in Section 12.2.1.2 of the ROD, under restricted activities, construction of buildings above the VOC plume is prohibited without prior approval from the Navy and DTSC. The preferred remedy will prevent a complete pathway from occurring. In addition, the Navy plans on actively treating the VOC plume using ISCO followed by MNA. TCE concentrations are anticipated to decrease significantly. The protectiveness of the remedy, including the prohibition of buildings above the plume, will be re-evaluated during the FYR. The regulatory agencies have concurred with

RESPONSES TO COMMENTS FROM PETER STRAUSS (CONTINUED)

the selected active remediation remedy of ISCO and MNA for the groundwater plume.

California Public Health Goals. Because it has been determined that groundwater in the uppermost aquifer at IR Site 1 is not currently used and is not likely to be used as a source of drinking water as indicated by the EPA (EPA 2000), the maximum contaminant levels (MCL) and maximum contaminant level goals (MCLG) are not potential ARARs (BEI 2006, p. 3-6). Similarly, the California Public Health Goals for TCE are for drinking water and are not ARARs or criteria TBC.

Cap Design and Remediation of Area 1

27. Comment: It is my opinion that if waste is going to remain in place, then an engineered cap that limits water infiltration is necessary. It is not clear why the engineered cap has been rejected; or even why a soil only cap would meet regulatory requirements. There is not sufficient evidence to rule out that groundwater will continue to act as a transport mechanism for dissolved contaminants to the Bay. At Moffett, the Runway landfill was also first proposed as a soil cap; the RAB at Moffett and regulators requested that an engineered cap be constructed. The Navy has argued in its response to EPA comments on the FS that since the landfill stopped operating before cover requirements went into effect, it does have to meet some closure requirements (e.g., Section 22 CCR 66264.310(a)(1) requires a cover designed to prevent the downward entry of water into the landfill for 100 years). Whether this statement is correct does not relieve the Navy of choosing a remedy that controls contaminant migration.

Response: Please see the response to ARRA Comment 3 above, which explains that an engineered alternative cap, Soil Alternative S1-4b in the PP, is unnecessary and that infiltration is not a RAO. Therefore, infiltration is not a design parameter. The regulatory agencies (EPA, DTSC, and the Water Board) have agreed with the proposed 4-foot-thick soil cover.

28. Comment: An alternative not considered in the engineered cap is using a bentonite layer to impede infiltration. This may be less expensive than a geomembrane, and has the benefit of a certain amount of self repair in case of a seismic event.

Response: As discussed in the response to ARRA Comment 3 above, a low-permeability layer in Area 1 to prevent water entry, including infiltration, is not necessary. For Soil Alternative S1-4a, soil cover for

RESPONSES TO COMMENTS FROM PETER STRAUSS (CONTINUED)

Area 1a, groundwater in the VOC plume area will be actively remediated by ISCO and MNA, Alternative GW3. The attenuation analysis in Appendix F of the FS report suggests that a low-permeability layer in Area 1 to prevent water entry is not necessary (BEI 2006, p. 5-7).

29. Comment: **The cap design should include a bio-barrier that prevents burrowing animals from coming into contact with the waste.**

Response: As indicated in the FS report, the 4-foot thickness is presumed to be adequate to prevent breaching of the cover by burrowing animals (BEI 2006, Vol. 1, p. 6-28, and Vol. 2, Appendix G, p. 20).

30. Comment: **An engineered cap covering part of Area 1 was not considered, but may be possible for Site 1. The runway in Area 1a may not have to be covered, so long as there is pavement inspection and maintenance program, as suggested by Remedial Alternative S2-4. Note, however, that surface inspection of the runways, or for that matter the proposed soil cap or engineered cap, would not be possible once a golf course is built.**

Response: An engineered cap covering Area 1 is considered as Soil Alternative S1-3 in the FS report (BEI 2006)

Golf courses have been successfully constructed on landfill covers, and nonvisual methods are available for monitoring the integrity of the cover at these sites. EPA has issued an information document entitled "Reusing Cleaned Up Superfund Sites: Golf Facilities Where Waste is Left on Site" that provides examples of installed golf courses successfully being constructed on landfills and that endorses future use of landfills as golf courses (EPA 2003).

The comment is noted for pavement maintenance in Area 1a. Pavement maintenance will be performed on exposed paved surfaces.

RESPONSES TO COMMENTS FROM PETER STRAUSS (CONTINUED)

31. **Comment:** The reuse plan has designated the Site 1 area for recreational reuse consisting primarily of a golf course, a beach area, and a shoreline walking path. Additionally, a historic training wall is present along portions of the northern border of Site 1. It is unclear whether the Navy has considered the Golf course in its remedial design. The golf course would impose additional structural parameters in the case of a seismic event, and would require a great deal of irrigation water that would infiltrate the cap. Both of these elements need to be looked at in the cap /cover design.
- Response:** Please see the response to Comment 17 in Major Comments in Cover Letter.
32. **Comment:** The Soil Cap alternative proposes to use dredge materials from Oakland Harbor. This may not be clean soil, and would require additional study to ensure that there are not additional contaminants being added to the cover. I recommend that if the Navy is going to use dredge spoils for a soil cap, then a rigorous sampling program should be adopted to ensure that contaminants such as lead, PCBs, MTBE and PAHs are screened prior to emplacement.
- Response:** This comment is noted. Dredge fill materials are assumed in the FS report for costing purposes only. The Navy will detail the exact type of soil in the RD. The Navy is committed to screening any fill material used in the remedy to ensure that it contains neither concentrations of chemicals above soil remediation goals nor other deleterious materials.
33. **Comment:** In August 2002, the Geotechnical Feasibility Report “recommended” that a 24-ft wide soil-cement gravity wall with stone columns placed adjacent to and in the fill to reduce the effects of liquefaction and preventing slippage into the San Francisco Bay. However, this element was not included in the proposed remedy and was left for further study in the remedial design stage. By not including this design component, and its costs, into the analysis of alternatives, the exclusion of remedies such as excavation of larger areas is a biased result.
- Response:** The Navy will meet all ARARs, including those regarding seismic stability of the landfill. The seismic ARARs included in the ROD are RCRA seismic requirements, Cal. Code Regs. tit. 22, § 66264.310 (a)(5). The details of all parameters of the remedy will be determined during the RD.

RESPONSES TO COMMENTS FROM PETER STRAUSS (CONTINUED)

34. **Comment:** In addition, the FS stated that shoreline debris relocation component for one of the alternatives was intended to provide an alternative to a soil-concrete gravity wall that was recommended in the Geotechnical and Seismic FS for Site 1 (2003). This was based on the assumption that excavating buried waste within 25 feet of the shoreline and relocating the excavated waste to the interior of Site 1 may reduce the risk of a waste release to the San Francisco Bay from earthquake-induced lateral spreading. This alternative was not adopted in the proposed plan; however, the FS states that depending on the limits of buried waste and shoreline waste relocation activities, the Navy could reduce the scope of (or eliminate the need for) a geotechnical remedy. This statement goes to the very heart of the criticism of the proposed plan: that is, by not characterizing the waste cells, the proposed remedy is uncertain both in terms of cost and effectiveness.

Response: The FS evaluations have identified disadvantages with relocating significant portions of the waste disposal area. Therefore, geotechnical considerations will need to be evaluated during the RD. Former waste disposal areas are not believed to have extended to the shoreline areas except for the burn area (Area 1b), which will be excavated under preferred Soil Alternative S1-4a. Geophysical surveys, test pitting, and soil borings will also be conducted to assess the spatial limits of buried waste and the proximity of waste to San Francisco Bay under Soil Alternative S1-4a. All remedial activity would meet ARARs. In addition, please see the response to Comment 3 above in Major Comments in Cover Letter.

35. **Comment:** Another element of the proposed plan that should be evaluated for Area 1 is removal of hot spots within Area 1, besides removal of Area 1b. Many comments on the FS were concerned that covering the waste would leave small, time-delayed pockets of material that may contaminate the groundwater and the Bay in the future. Because the Navy has not even determined whether drummed wastes still exist in the landfill or the extent of wastes in the landfill (see Data Gaps), I think it is important that hot spot removal not be precluded from the remedial options. Only after full characterization can the Navy realistically cover the remaining waste.

Response: The Navy believes that enough information has been gathered to make an appropriate remedial decision, and the Navy and the regulatory agencies concur with the proposed remedy.

RESPONSES TO COMMENTS FROM PETER STRAUSS (CONTINUED)

See the Response to Comments from ARRA, Comment 4, for a response regarding determination of whether drummed wastes still exist in the waste disposal area.

See the Response to ARRA Comments, Comment 2, Item 1, for a response regarding full characterization of the remaining waste.

For locating hot spots, the Navy has been following EPA's presumptive remedy guidance and policy for landfills, which indicates that because there has been no evidence during the last 50 years to suggest the presence or location of time-delayed pockets of material or drummed wastes, there is no basis to warrant hot-spot removal in the remedy (EPA 2003, Highlight 4). The Navy will be re-evaluating the protectiveness of the remedy every 5 years in accordance with the CERCLA process.

The Navy has followed EPA's specific CERCLA military landfill (EPA 1996) and municipal landfill (EPA 1993) presumptive remedy guidance and policy for characterizing and containing the buried waste. EPA's guidance indicates that full characterization is not necessary or appropriate for selecting a response action (EPA 1993) and that containment with a cover is the appropriate remedy for buried waste (EPA 1996). All areas remaining after excavation of Area 1b will be covered by a 4-foot-thick soil cover designed to protect receptors from future exposure. The soil cover will eliminate the exposure pathway and any risk. Please see the response to Comment 2 in Major Comments in Cover Letter.

36. **Comment:** **The FS states that the Navy may further evaluate other alternatives to the stone columns during remedial design. Recent experience has shown that considerable cost savings can be achieved with "earthquake drains" offered by Nilex, successfully installed in fill soil used for the approach to the new San Francisco-Oakland Bay Bridge and have undergone a rigorous review and acceptance process by the California Department of Transportation. The entire discussion of seismic stabilization should be revisited, prior to the adoption of the Record of Decision.**

Response: See the response to Specific Comment 33 above. The details of seismic stability will be addressed during the RD and will meet all ARARs.

37. **Comment:** **It is worth considering that most scientists agree that climate change will cause sea levels to rise over the next 100 years. Predictions of a 3 foot rise in sea levels over the next 50-100 years are generally**

RESPONSES TO COMMENTS FROM PETER STRAUSS (CONTINUED)

accepted. A sea level rise of 6 inches will change the frequency of a 100 year storm surge to a 10 year storm surge at the entrance to the Bay. All proposed remedies that are adjacent to the Bay should take these facts into consideration. It is worth noting that most of the remedies which leave waste in place are given a rating of moderate for long term effectiveness and permanence. However, in the discussion of this criterion in the FS, there is not a discussion of climate change.

Response: Please see the response to Comment 18 above in Major Comments in Cover Letter.

ARARs

38. **Comment:** I agree that State Water Resource Control Board Resolution (SWRCB) 68-16 (i.e., the non-degradation policy) and SWRCB Resolution 92-49 apply to groundwater at this site. This resolution applies to discharges: either underground or above ground discharges as is commonly understood by the general term discharge. I encourage the RWQCB to ensure compliance with these Resolutions.

Response: See the response to Specific Comments in Attachment, Groundwater, Specific Comment 7 above.

Range Cleanup

39. **Comment:** The firing range berm had a foundation of concrete mixed with 55-gallon drums of 20 mm projectiles. It is not clear whether the proposed plan and TCRA includes removal of the foundation, or whether there has been an analysis of whether any of the elements, including lead, have migrated from the concrete. If soil below the berm is also to be screened, soil contaminated with both metals and organic compounds may make this solution difficult. If soil contains volatile organic compounds (VOCs), it would be akin to aerating the soil and may require additional regulatory oversight. Measures should be taken to prevent wind-borne particulates that may be laden with lead if dry screening is a step in the process.

Response: The removal of the firing range berm is addressed in Section 6.8.3 of the TCRA work plan (Tetra Tech EC, Inc. 2007).

RESPONSES TO COMMENTS FROM PETER STRAUSS (CONTINUED)

VOCs would be monitored as part of the health and safety program during the removal action, and appropriate actions will be taken if VOCs exceed any applicable regulatory requirements.

Soil with soluble lead or other RCRA constituents exceeding the toxicity characteristic leaching procedure (TCLP) standards would be treated at the disposal facility to meet land disposal restrictions (LDR) and disposed of as RCRA hazardous waste. Soil with total lead or other California-regulated constituents exceeding the total threshold limit concentration (TTLC) or with soluble lead exceeding the soluble threshold limit concentration (STLC) standard would be disposed of as California hazardous waste. Soil with total and soluble lead below these limits would be disposed of as nonhazardous soil.

For windborne particles that may be laden with lead, the TCRA work plan provides dust control measures (Sections 6.4 and 8.2), monitoring for radium in airborne dust (Appendix A, Section 7.4), and personnel health and safety measures during excavation and off-site disposal activities (Appendix A) (Tetra Tech EC, Inc. 2007).

40. **Comment:** **The skeet range, next to the pistol range, generated lead shot and fragments of clay pigeons. These clay pigeon fragments contained PAHs. Some clay pigeon fragments are still evident on the surface within the line of fire. The zone of fire in the bay was designated as Site 29, and is not a subject of this Proposed Plan. However, ranges such as this have a great deal of scatter, and some lead shot is potentially beyond the Site 29 boundary, very near to the shoreline. At low tides, shorebirds feed in this area, and the lead shot in particular poses a threat. The Navy should take note that EPA's guidance document on Best Management Practices at Outdoor Shooting Ranges (EPA Region 2, 2001) strongly states that "Shooting into water bodies or wetlands should not occur". Most current best practice manuals, even those developed by sport shooting organizations, do not advocate shooting into water or wetlands.**

Response: Site 29 is no longer active. Therefore, best management practices are unnecessary. Site 29 has been remediated in accordance with the CERCLA process and has now been classified with a status of No Further Action (Navy 2005). Additionally, please see the response to Comment 5 in Major Comments in Cover Letter.

RESPONSES TO COMMENTS FROM PETER STRAUSS (CONTINUED)

41. **Comment:** Has depleted uranium (DU) been used in any of the shells? Does the Navy need to list a cleanup standard for DU?

Response: Depleted uranium was not used by the United States armed forces until the 1960s and 1970s. The Site 1 landfill closed in the 1956. Therefore, it is highly unlikely that depleted uranium is present in the landfill. Additionally, there are no records pertaining to Site 1 that record the use, storage, or disposal of depleted uranium (see the website at the address below).

<http://www.globalsecurity.org/military/systems/munitions/du-history.htm>

Institutional Controls

42. **Comment:** The Institutional Controls, as set forth in the Proposed Plan, have two difficulties, related to the eventual conversion of Site 1 into a golf course and public beach. Proposed land-use restrictions, although specified, fail to state how they will be enforced, and who will enforce them. For example, the City has proposed building a golf course over the landfill cap essentially adding approximately 8-feet of additional soil. Aside from destroying the cap vegetation cover, the added weight and irrigation regime may cause additional infiltration, increase leachate and reduce stability. It is crucial that the Plan state who would be responsible for maintaining the stability and performance of the cap.

Response: Please see the response to Comment 20 above in Major Comments in Cover Letter.

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ATTACHMENT B-4
IR SITES 1, 2, AND 32 TCRA UPDATE
(18 Pages)



Welcome

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IR Sites 1, 2, and 32 Time-Critical Removal Action Update



Andrew Baughman, PE
Remedial Project Manager
June 7, 2007



Overview

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- Background
- Remedial Action Objectives (RAOs)
- Time-critical Removal Action (TCRA)
- Schedule
- On-going Activities
- Summary



Background

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- Installation Restoration (IR) Sites 1
 - Northwest corner of Alameda Point
 - 1943-1956 disposal
- IR Site 2
 - Southwest corner of Alameda Point
 - Disposal area from 1952-1978
- IR Site 32 (Northwest Ordnance Storage Area)
 - Northwest corner of Alameda Point (east of IR Site 1)
 - 2 Buildings
 - Building 594
 - Building 82

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Removal Action Objectives

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- To prevent ingestion, dermal contact, or inhalation of radioactive contamination above background concentrations.
- To assure that the dose received from potential pathways from the radium-impacted waste to a member of the public in the accessible environment does not exceed 15 millirem per year (mrem/yr).

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Time-Critical Removal Action

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- Radium-226
 - Currently, surface radium-226 contamination at IR Site 1 is being removed as stated in Alternative 6-4 of the Final Feasibility Study Report for IR Site 1 (except in Area 1a). If any exceedances are found in the subsurface they will also be removed.
 - This removal action also addresses data from the Radiological Survey completed in November 2006
- MPPEH
 - Material potentially presenting an explosive hazard (MPPEH) at IR Site 1 is also being removed and disposed at an off-site facility.

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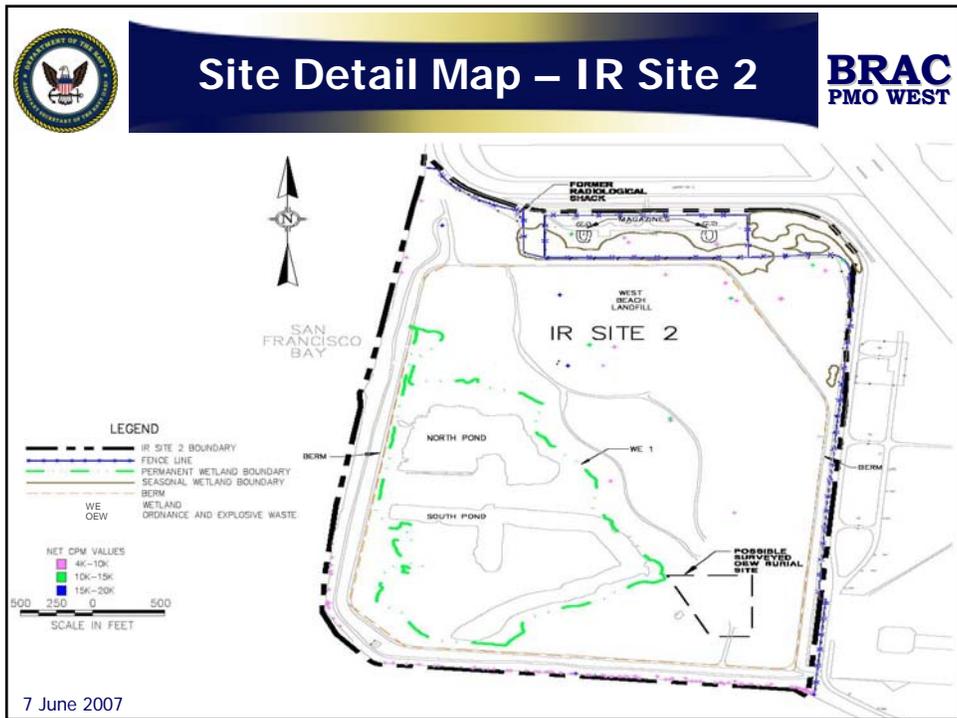
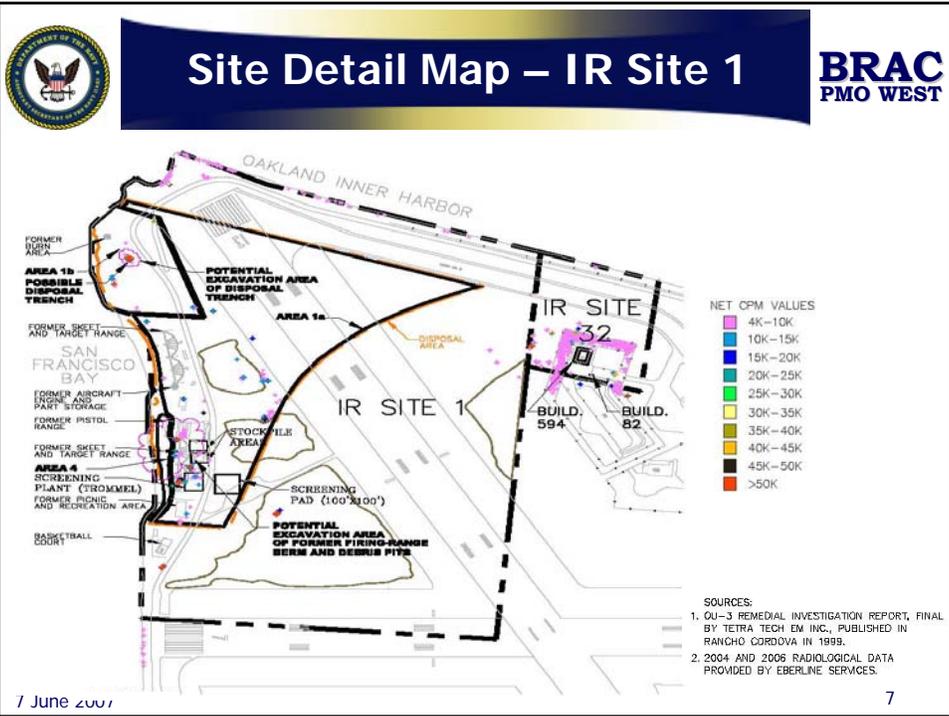
Schedule

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- Mobilization – Late February 2007
- Removal Action – March 2007
- Finish Excavation – June 2007
- Demobilize – July 2007

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Activities

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- Mobilization
- Vegetation clearance
- Topographic survey
- MPPEH survey (geophysical survey)
- Excavation activities
 - Removal of radioactive material
 - Excavation of Disposal Trench
 - Excavation of former Firing Range Berm and Debris Pits
 - Post-excavation sampling and stockpile characterization
- Site restoration and demobilization

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Vegetation Clearance

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- Vegetation cleared from work areas within IR Sites 1, 2, and 32.
- Clearance of vegetation in area of MPPEH storage magazines.



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Topographic Survey

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- Established horizontal and vertical controls
- Surveyed pre-removal topographic features
- Provide high and low point elevations
- Provide limits of excavation
- Post-Excavation
 - Confirmation Sample Locations
 - Disposal Trench Limits
 - Anamoly Locations
 - Debris Pits
 - Former Firing Range Berm

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Geophysical Survey

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- A geophysical survey was performed over the known or suspect areas (e.g., Debris Pits, Disposal Trench) where MPPEH and subsurface anomalies may exist.

- The survey located potential buried sources and obstructions (e.g., MPPEH, etc.) and is used to provide the maximum protection possible for site workers against exposure to potential sub-surface hazards during excavation activities.



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Excavation Activities

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- Removal of radiological anomalies from IR Sites 1, 2, and 32 (except Area 1a).
- Includes the removal of the former Firing Range Berm, Debris Pits, and the Disposal Trench.

As of May 25, 2007:

- 4,869 cubic yards (cy) of soil have been excavated
- 4,500 cy processed through the Trommel screening plant



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Soil Screening Activities

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- Scanning pad was constructed of asphalt & equipped with berms for secondary containment to prevent wastewater run-off & run-on.

- The scanning pad allows staging of material for initial MPPEH/radiological survey and segregation.



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Soil Screening Activities

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- Following the scanning of the excavated soil on the asphalt pad, the soil is processed through the on-site Trommel-type screening plant.



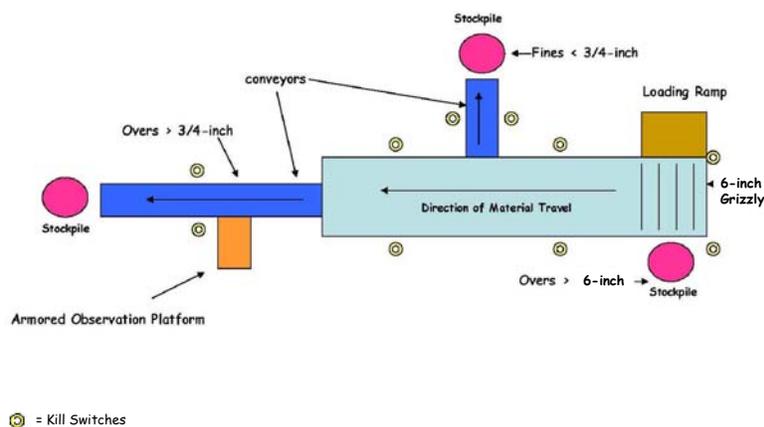
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Trommel Screen Plant

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NOT TO SCALE

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Former Firing Range Berm

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Former Firing Range Berm

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- Removal of the berm was performed in 6-inch lifts using armored earthmoving machinery after initial screening of the lift for MPPEH and radioactive anomalies. Excavated soil was transported and laid out in a 6-inch layer on the asphalt pad to conduct a second MPPEH and radiological survey.

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Former Firing Range Berm

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- Excavated soil & debris from the former Firing range Berm was processed through a Trommel screening plant where the soil was segregated by size (greater than 6-inch, ¾-inch to 6-inch, and smaller than ¾-inch) and the soil passing through the screen is stored in stockpiles for chemical and radiological characterization for off-site disposal .



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Former Firing Range Berm

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•Post-Excavation



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Debris Pit

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- MPPEH located within the Debris Pit excavation prior to being screened on the asphalt pad
- Historical accounts indicated large volumes of MPPEH scattered in Debris Pits area. Abundant MPPEH were exposed at surface after storm and high tide events

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Recovered MPPEH

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- **22,575 MPPEH debris items** have been recovered (as of May 25, 2007).
- All MPPEH debris are 20mm rounds
 - 21,764 are 5X
 - 811 classified as 3X

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Recovered MPPEH

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- 20mm M99 Practice



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Recovered MPPEH

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- 20mm M99 Practice



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Radiological Material

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- **Radiological Material and Potentially Radiologically Impacted Material Removed**
 - **3.2 cubic yards** – soil excavated to date from the immediately adjacent (1-2 foot radius) surrounding radioactive anomalies that have been collected.
 - 12 Radioactive Point Sources (stored in a 55 gallon drum at the project Bunker Radioactive Materials Area).
 - To date **eighty-five 55-gal drums (27 cubic yards)** of potential radioactively contaminated soil removed from “general area” locations that were greater than the investigation level of 3-Sigma above Background (reading taking by a Sodium Iodide Detector) and are pending analysis.

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Radiological Point Sources

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- **Current Point Source Inventory**

ID	DESCRIPTION
1	Empty Glass Vial
2	Empty Glass Vial
3	1"x1" metal or brick "chip"
4	Soil Clump
5	Instrument Gauge
6	Soil Clump
7	Instrument Gauge
8	Instrument Gauge
9	Toggle Switch
10	Debris Chip
11	Debris Chip
12	Debris Chip

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Recovered Radiological Point Sources

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Empty Glass Vial



Instrument Gauge



Debris Chip

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Recovered Radiological Point Sources

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Toggle Switch



Debris Chip



Soil Clump

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Radiological Clearance Procedures

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- Radiological clearance of personnel after exiting exclusion zone



- Radiological clearance of equipment and vehicles after exiting exclusion zone

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Disposal Trench Location

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- The boundaries of the Disposal Trench are based on the location sited for the trench sited in the 1983 Initial Assessment Study.



- Radioactive material was allegedly disposed of in an unlined trench 50 feet long, 8 feet deep, and approximately 11 feet wide north of the rifle range, approximately 50 feet north of the above ground water outlet.

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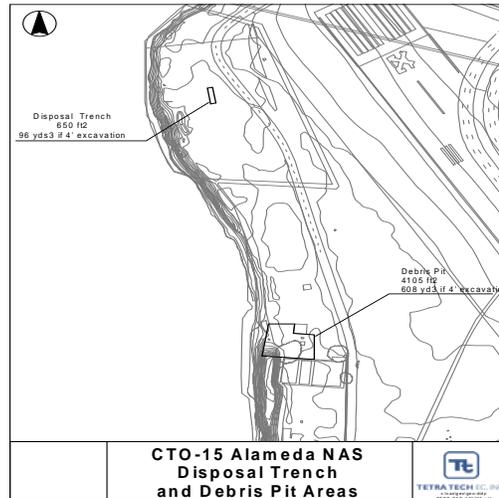
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Disposal Trench and Debris Pit

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- Disposal Trench will be investigated/excavated during early June and work is currently being performed at the Debris Pit.
- The majority of the MPPEH recovered from the site is from the Debris Pit.



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Disposal Trench Excavation

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- Investigation/Excavation of the Disposal Trench will be conducted in 6-inch lifts. Prior to excavating the soil, the surface of the excavation will be surveyed for Radiological and metal presence.
- Approximately 96 loose cubic yards (CY) are anticipated to be excavated from the Disposal Trench if the excavation is limited to 4 feet depth and 196 CY if the excavation is carried down to 8 feet depth.

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Removal Approach

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- **Transportation and Disposal:**
 - Total volume of soils to be excavated is expected to be between 5,000 to 5,500 cy.
 - Waste classified as hazardous will be transported off-site to a CERCLA facility (Kettleman Hills).
 - Non-hazardous waste transported to Class II Landfill (Altamont or Forward)
 - LLRW and mixed waste will be handled by RASO and DoD LLRW Executive Agency (U.S. Army Corps of Engineers).
 - MPPEH will be de-militarized and recycled

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Removal Approach

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- **Site Restoration:**
 - The footprint of the temporary stockpile areas will be restored to pre-construction condition.
 - The released concrete will be used along the former Firing Berm location
- **Demobilization:**
 - Upon completion of the remediation activities, temporary facilities and utilities will be removed from the site, and the support zone areas will be restored.
 - Construction equipment will be decontaminated before leaving the site.

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Summary

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- The Final Action Memorandum was completed on January 31, 2007
- Final Time-Critical Removal Action (TCRA) Work Plan was completed on March 2, 2007.
- Mobilization activities began late February 2007.
- Demobilization will be completed by July 2007.

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Questions?

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