FINAL NAVAL AIR STATION ALAMEDA RESTORATION ADVISORY BOARD MEETING SUMMARY

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

March 4, 2003

ATTENDEES

See attached list.

MEETING SUMMARY

I. Approval of Minutes

Bert Morgan, Community Co-Chair, called the meeting to order at 6:33 p.m.

Mr. Morgan asked for comments on the February 4, 2003, Restoration Advisory Board (RAB) meeting minutes. Dale Smith, Sierra Club, requested the minutes be struck and resubmitted with Sierra Club's comments on the Site 17 Remedial Investigation (RI) Report included as an attachment. Mike McClelland, Department of the Navy (Navy), Co-chair, stated the minutes will be tabled until the next RAB meeting.

II. Co-Chair Announcements

Mr. McClelland made the following announcements.

Anna-Marie Cook, U.S. Environmental Protection Agency (EPA), had a baby boy, Jaden, on Valentines Day. Ms. Cook and Jaden are both doing well.

Mr. McClelland introduced Heather Imgrund, Tetra Tech EM Inc. (Tetra Tech), to the RAB. Ms. Imgrund will replace Courtney Colvin when she leaves Tetra Tech to attend graduate school.

Elizabeth Johnson, City of Alameda (Alameda), will not be in attendance due to illness. Ardella Dailey will not be in attendance due to an unscheduled conflicting meeting.

Mr. McClelland announced the following upcoming due dates. The draft final Site 14 Feasibility Study (FS) and response to comments are due by March 15, 2003. This will be followed by a 30-day review period. The RI Report for sites 14 and 15 will be made final on March 28, 2003, and the draft Site 17 RI Report is due on March 29, 2003.

Various documents and correspondence were distributed to the RAB.

III. Site 2 Ordnance and Explosive Waste (OEW) and Geotechnical Report

Abid Loan and Lance Humphrey, Foster Wheeler, presented the following summary of the Site 2 OEW and Geotechnical Report. A handout of the presentation was provided. Mr. Loan stated

that the site historically was used for waste disposal and future remedial action will likely involve construction of a cap. However, prior to capping, the geotechnical characteristics of the site, OEW, and potential unexploded ordnance (UXO) had to be evaluated. The purpose of this study was to evaluate these types of subsurface site conditions for future remedial action and construction activities, such as a landfill cap. The specific objectives were to locate, identify, and remove OEW; characterize existing soil covers; identify seismic hazards, and perform preliminary engineering analyses. The scope of the study included 1) OEW characterization and performance of a time critical removal action (TCRA); 2) a geotechnical and seismic investigation; and 3) preparation of a geotechnical FS.

Site 2 is 110 acres in size, of which approximately 77 acres was previously used for waste disposal. The site includes a 30-acre wetland, which was a key concern for the Navy during the investigation. To avoid negatively impacting it, the wetland was delineated at the beginning of the study so contractors could avoid it while conducting investigation activities. Site 2 is planned to be transferred to US Fish and Wildlife Service (USFWS) for use as a national wildlife refuge.

OEW Characterization and the TCRA

OEW characterization and the TCRA involved two main activities: a surface sweep and removal of the OEW burial site. The surface clearance involved visual reconnaissance, vegetation removal, grid-by-grid surface sweep, and establishment of exclusion zones. Mr. Lance Humphrey stated that 8,882 20-millimeter soft steel target practice rounds and an inert land mine were found. All rounds were demilitarized by cutting them in half. George Humphreys, Co-chair, asked if the rounds had explosive tips or any depleted uranium. Mr. Lance Humphrey stated that no rounds had either uranium or explosive tips and the rounds were only used for target practice. Ms. Smith then asked if testing was conducted to determine if uranium was in fact present. Mr. Lance Humphrey answered by saying that no testing was conducted because the rounds found at Site 2 were manufactured before depleted uranium was used.

Historical records indicate that within Site 2 there is a possible OEW burial site that is approximately 2.5 acres in size. A 1.5-acre buffer zone was added to the suspected area. Soil was removed to a depth of 1-foot below ground surface (bgs) one grid at a time. Excavation paths were swept with mine detectors by technicians. All OEW was removed and demilitarized prior to disposal. All soil was processed to separate trash and debris and scanned soil was used for backfill. The majority of the buried OEW was found at about five different sites. In addition, all OEW found was inert.

Lea Loizos, ARC Ecology, asked what the significance of a one-foot bgs depth was. Mr. Lance Humphrey responded by stating Department of Defense (DOD) requirement for excavation depths at OEW sites vary depending on a site's intended reuse. The requirement for sites that are to be redeveloped as wildlife refuges such at Site 2 is 1-foot bgs. Mr. Morgan asked if any samples were ever taken below the 1-foot bgs depth. Mr. Loan stated that in the cases where OEW was encountered, samples were taken until no OEW was encountered. Ms. Smith asked where in Site 2 the excavation actually occurred. Mr. McClelland indicated that the excavation occurred in the southeast corner of Site 2.

Geotechnical and Seismic Investigation

For the geotechnical and seismic investigation, three key work elements were conducted: 1) field

investigation, 2) geotechnical soil testing involving strength parameters, soil classification, settlements, and bearing capacity, and 3) geotechnical and seismic analysis. These analyses will be taken into consideration for any future design of structures at the site (landfill cap). The field investigation consisted of on-shore and off-shore drilling, exploratory test pits, cone penetrometer testing, topographic and bathymetric surveys, and a wetland delineation. The geotechnical soil testing was used for seismic geotechnical analysis. The geotechnical and seismic analysis included a liquefaction evaluation, slope stability analysis, and a ground response analysis.

The purpose of the geotechnical and seismic analysis was to identify site conditions and any geotechnical hazards. A consultant was hired from southern California to assist with the seismic analysis. The analysis involved an evaluation of how the site would be affected from any side, by a model earthquake. For the seismic analysis, an earthquake magnitude of approximately 8.0 and occurring on the San Andreas Fault was used. Later in the discussion, Ms. Smith and James Leach questioned the use of an earthquake originating from the San Andreas Fault versus the Hayward Fault. Mr. Loan stated that they did an analysis using a 7.1 magnitude earthquake emitting from the Hayward Fault and determined the impact from that earthquake would be less than the impact from an 8.0 magnitude earthquake emitting from the San Andreas Fault. The model used represents the worst-case scenario. Ms. Smith stated that the Hayward Fault could potentially produce the worst-case scenario as it has the potential to emit an 8.6 magnitude earthquake. Mr. Leach agreed with Ms. Smith's statement and stated that data from the Hayward Fault is more credible because it has been studied with more relevance to the Alameda area. Mr. Loan stated that a seismologist from California Polytechnic Institute determined which fault was most appropriate based not only on historic and potential earthquake magnitudes, but also on loading, acceleration and the sites response to spectra. Mr. Loan stated that he would be happy to share the report that includes the analysis and the basis for selecting a San Andreas Fault earthquake as the worst-case scenario.

The slope stability analysis was used to compare the static slope to what might happen to the slope during and after an earthquake. Above water the static slope was generally flatter than 2:1, and below water the slope had approximately a 5 percent grade (1:20). A figure included in the handout (page 14) illustrates that fill material and Young bay Mud are geological layers that have potential slope failure. These layers were also illustrated in a figure on the following page of the handout. Mr. George Humphreys asked what the dotted lines on the figures represent. Mr. Loan stated that they represent different layers. Kevin Reilly asked for clarification about the sloped curve in the figure on page 14 of the handout. Mr. Reilly wanted to know if the fill and Young Bay Mud layers represent the critical failure surface. Mr. Loan stated that the figure represents slope failure under static conditions. In conclusion, Mr. Loan stated that from an evaluation standpoint these materials are not suitable for providing significant support.

Geotechnical and seismic hazards include liquefaction potential and slope instability. The fill material, which constitutes the upper most geological unit at Site 2, is classified as liquefiable. Seismically-induced settlement is estimated to be up to 18 inches (generally accepted value is less than [<] 1 inch) and liquefaction-induced lateral displacements are estimated to be 20 feet (generally accepted value is < 1 foot). For slope instability, the static factor of safety (FOS) is estimated to be between 1.46 and 2.58, (state of practice FOS is greater than [>] 1.5). The post earthquake FOS is estimated to be between 0.86 and 1.94, (the U.S. Army Corps of Engineers [USACE] guidelines FOS is > 1). The predicted permanent lateral deformation is estimated to be between 4 and 19 feet (the generally accepted lateral displacements for slopes supporting structures is defined to be < 6 inches).

Feasibility Study

Finally, Mr. Loan presented the geotechnical FS at Site 2. The objective of the study is to prevent release of waste into the San Francisco Bay (Bay). The performance criteria were to limit permanent lateral displacements to 4 feet. To evaluate remedial alternatives, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) guidelines and U.S. Environmental Protection Agency (EPA) screening criteria were identified. General response actions were identified as soil improvement and physical buttresses. Twenty remedial alternatives were developed that can be used in combination with each other.

Mr. George Humphreys asked for clarification on why lateral displacement was only being limited to 4 feet, when the previous slide stated that the generally accepted lateral displacement is less than 1 foot. Mr. Loan responded by stating that the value of < 1 foot is for liquefaction-induced lateral displacements after earthquake events. The 4-foot value is for permanent lateral displacements. Mr. Loan also stated that the 4-foot limit was established, because at that level of displacement, waste can still be prevented from releasing into the Bay.

After a thorough evaluation of each of the remedial alternatives, the Navy has concluded that the most suitable alternative is a soil cement gravity wall in combination with stone columns. This will involve the construction of a 17 to 38 foot wide soil cement gravity wall in the Young Bay Mud layer and installation of stone columns in the fill layer. This will provide both reduction of liquefaction potential and containment of liquefiable soils behind the improved soil zone. A diagram of the recommended alternative was included in the handout.

Mr. George Humphreys asked about potential differential settlement that could crack a landfill cap and the chemical characterization of the landfill. Mr. Loan responded by stating the purpose of the geotechnical FS was to address only geotechnical and seismic hazards. However, differentiated settlement will be evaluated during the chemical FS when the landfill cap is evaluated. In addition, Mr. Loan stated that ongoing maintenance is required to deal with differential settlement at all landfills. Mr. George Humphreys also noted that the contents of Site 2 have not fully been investigated. Mr. George Humphreys recalled that municipal garbage might have been collected by a garbage service, and not disposed of at Site 2. Andrew Dick, Navy, added that the Site 2 Remedial Investigation (RI) has not yet been completed, and these issues will be resolved in the future. Ms. Smith asked how close the wall would be to the riprap and Mr. Dick replied by saying that the design has not yet been completed. Ms. Loizos reiterated that the RI has not yet been completed and the Navy is only proposing recommendations and not making final decisions. In addition, Mark Ripperda, EPA, stated that the purpose of the geotechnical study is to provide recommendations to prevent waste from entering the Bay in the event of a geotechnical hazard, and not to address surface exposure to chemicals. Ms. Smith expressed her concern that if site characterization has not been done, the presumptive remedy may fail. Mr. Loan addressed Ms. Smith's concern by stating that this study is about the geotechnical and seismic characteristics and behavior of the soil, and that chemical constituents present would not impact the design. Mr. Reilly asked if there was a timeline for the chemical investigation. Mr. Dick stated that there is a timeline, however, the Navy has not yet received funding. The Navy is planning to meet with the EPA in June 2003 to discuss this issue. Mr. Ripperda added that the work would probably be done in 2004 or 2005.

There was a discussion regarding the delineation of the wetlands at Site 2 and how it was determined waste was not present in the wetlands. Mr. McClelland stated that he did not believe that the wetland area was ever used for waste disposal. However, soil was excavated from the

wetland area and transferred to the disposal area and layered over the waste. Mr. Loan stated that a Foster Wheeler biologist delineated the wetland. Ms. Smith asked for clarification that the person that was responsible for making decisions about activity around the wetland was qualified to do so. Mr. Loan stated that a biologist trained in wetland delineation and who delineated the wetland was on site and kept all activity away from the wetland.

Ms. Loizos questioned how it was decided that a TCRA was warranted at Site 2. Mr. Lance Humphrey stated that he believed the decision was related to the ongoing investigation. To continue fieldwork, removal of OEW had to be conducted first. Mr. Dick responded by stating that the decision to conduct a TCRA was made by the BCT and was intended to be an interim action. The community will have ample opportunities for input throughout various phases of the process. Ms. Smith requested that the Navy research the decision to conduct a TCRA at Site 2. This was made an agenda item for the April 1, 2003, RAB meeting.

IV. Seaplane Lagoon (SPL) Focus Group Update

Mr. Dick, Jennifer Holder (Blasland, Bouck, and Lee, Inc,), Virginia Lau (Battelle), Michael Pound, Ms. Loizos, Mr. Doug deHaan (Alameda Economic Redevelopment), and Ms. Smith met on February 26, 2003 to discuss the SPL RI. Ms. Smith presented the outcome of the meeting by commenting that she was comfortable with the science used in the ecological risk assessment (ERA) and believed that the most conservative assumptions were used to define the Feasibility Study footprint. She was also pleased that data from the RWQCB reference sites were used in the assessment as an indication of the background levels throughout the San Francisco Estuary.

V. Site 29 (Skeet Range) RI Report

Mr. Pound, the Navy's Deputy Chief Environmental Engineer, presented a summary of the findings from the Draft Skeet Range (IR Site 29) Remedial Investigation Report, which was submitted to the BCT members on January 29, 2003. A handout of the slide presentation was provided to the meeting attendees. Mr. Pound stated the meeting with a brief discussion of the historical background associated with the Skeet Range. The Skeet Range is located at the northwest corner of Alameda Point and is composed of dredged spoils from surrounding waterways. The Skeet Range was active for approximately 30 to 40 years until closure in 1993. The majority of lead shot in the Skeet Range is located in sediments at approximately 5 to 10 feet below mean low water. The chemicals of concern (COC) in the Skeet Range consist of lead shot and polynuclear aromatic hydrocarbons (PAH), which were used as a binding agent for clay targets.

The primary objectives of the Skeet Range RI were to: 1) describe the distribution of lead shot in the surface and the subsurface sediments; 2) determine if the clay targets are the source of PAHs and estimate sediment accumulation rates; 3) present the methods and results of the human health risk assessment (HHRA) and ERA; 4) delineate areas that pose an unacceptable risk to human health and the environment and would therefore, require evaluation in an FS; and 5) propose preliminary acceptable lead shot levels in sediment that are protective of potential receptors.

Mr. Pound gave the following brief summary of the Skeet Range RI results. He noted that the majority of the lead shot was observed at 5 to 10 feet below mean low water and that the lead shot had not degraded based on the field investigation. Because the lead shot was not found in the surface at nearshore stations, no complete exposure pathway was determined for current and/or future recreational users. For the ERA, the primary exposure pathway identified in the RI

was through ingestion of lead shot as grit by diving ducks. Based on the probability model used to predict the uptake of lead shot by birds, the potential risk to diving birds was below the risk threshold when reasonable exposure assumptions were used. Although PAHs were used as binding agents in the manufacture of clay target, it was found using forensic fingerprinting techniques that the PAHs in sediment were distinctly different from the PAHs found in the clay target and thus, clay targets are not the source of PAHs in sediment. Further analysis of the PAH signature in sediment showed that the PAH concentrations were consistent with ambient levels and the highest concentrations were found near the mouth of Oakland Inner Harbor.

The RI was based on data collected from the 2001 field investigation where both grab and core data were collected and analyzed for PAHs, total petroleum hydrocarbons (TPHs), and lead shot/ grit count. The data were used in the PAH fingerprinting analysis as well as for the HHRAs and ERAs. In addition, three long cores were analyzed for the presence of Cesium 137 and Lead 210 radioisotopes for the sediment dynamics study. Although other isotopes may be used for this study, both cesium and lead are common tracers that are present in the atmosphere due to atomic fallout from nuclear testing conducted in the 1950s.

Each of the studies conducted in support of the RI were discussed in greater detail, starting with the PAH fingerprinting analysis.

Clay targets were not uniformly distributed throughout the sediment, but were found in two clusters corresponding to approximate locations of where trajectories from the shooting ranges intersected. However, PAH concentrations in the sediment were uniformly distributed. By using principal component analysis (PCA), it was shown that PAHs in sediment were chemically distinct from PAHs in clay targets. Based on these findings, it was concluded that clay targets are not the source of PAHs in sediment. Figures A, B, and C on Slide 10 of the handout illustrate the results of the PCA. By mapping the chemical concentrations of individual TPH and PAH compounds, the chemical constituents in soil were clustered on one side of the graph while the fragment signatures were scattered right of the cluster (see Figure A). The two separate populations indicated that the PAHs in the sediment and the PAHs found in the clay targets were of separate origins. Figure C shows the results of a more in-depth fingerprinting analysis to determine the chemical constituents used in the manufacture of clay targets. When analyzed more closely, both a petroleum and pyrogenic PAH signature was found in the clay targets, an indication that two types of targets were used at the Skeet Range. Mr. Pound concluded that clay targets are not the source of PAHs in sediment based on the results of the PAH fingerprinting analysis.

Ms. Smith asked what are the potential sources of PAHs found in the sediment if they are not associated with the clay targets. Mr. Pound responded by saying that the PAHs are probably associated with the sediment that was dredged and used as fill on the Skeet Range. He added that the supplemental investigation found that PAHs in sediment were similar to background levels. Mr. Steve Edde, Navy, also speculated that the PAHs in sediment may be attributed to a historical fire that occurred at the railroad/ferry pier north of the Skeet Range.

Mr. Pound continued the presentation with an overview of the sediment dynamics study. Three long cores were collected at the Skeet Range as part of the 2001 investigation and analyzed for radioisotopes lead^{210} (Pb) and cesium^{137} (Cs). Pb^{210} results from the decay of radon^{222} in the atmosphere. If Pb^{210} concentration exceeds the supportive level in the atmosphere, it falls out with rain and binds to sediment. Pb^{210} has a half-life of 22 years. When analyzing cores, the concentrations of Pb^{210} and its decay rate are examined to determine if there is a constant

decrease in concentration. Cs^{137} is associated with fallout from atmospheric testing that began in the 1950s and ended in 1972. If an area is a depositional environment, a peak of Cs^{137} will be found in soils deposited around the 1960s. The average sediment accumulation was estimated to be between 0.65 and 1 centimeter per year. In addition, worm mats, which are found only in depositional environments, were found offshore, providing additional evidence that it is a depositional environment. Worm mats have a lifespan of about 40 to 100 days and aid in keeping sediment intact. Based on the field investigation, no significant movement of lead shot outside the boundary of the Skeet Range was found to occur.

Kevin Reilly asked if the presence of radium would affect the outcome of the study. Mr. Pound responded that radium should no interfere with the concentrations measured for Pb^{210} and Cs^{137}. Mr. Pound indicated that other isotope may also be used to perform this analysis and Ms. Lau added that Pb^{210} and Cs^{137} were selected since Pb^{210} is naturally occurring with a relatively short half-life, while Cs^{137} is prevalent in the atmosphere due to the atomic testing.

The question was asked as to how comprehensive of the site characterization conducted in the 2001 investigation. To illustrate the number of samples collected, Mr. Pound referred the audience to the figure presented on page 13 of the handout. The figure demonstrated that the majority of the lead shot was found along the trajectories of the shooting ranges. Ms. Smith asked how many samples were taken in the study. Mr. Lau stated that 40 grab samples, 22 core samples and 3 deep core samples were taken. Approximately half of the samples were taken in the high impact zone, which encompasses 3.6-acre area in the middle of the Skeet Range. An attempt was made to collect one sample from each grid and resample historical locations from the Tetra Tech EMI study. Ms. Smith asked if the historical samples were found to be adequate. Ms. Lau responded that the samples were adequate for the purpose of that study and that the 2001 investigation was more comprehensive since samples were collected over the entire area of the Skeet Range.

Mr. Pound then proceeded to discuss the ERA, which was conducted using a two-tiered process, in accordance with EPA and Navy guidance. In the first tier, a screening level ERA (SLERA) was conducted using conservative benchmarks such as effects range-low (ERLs) and exposure assumptions. If the screening level ERA indicates unacceptable risks based on these conservative assumptions, then a baseline ERA (BERA) would be performed, which involves the use of more site-specific criteria and refined assumptions. The SLERA consists of four major components: (1) identification of chemicals of potential concern (COPECs); (2) selection of receptors of concerns; (3) determination of acceptable lead shot levels; and (4) evaluation of population risk based on conservative assumptions. Lead shot was identified as the only COPEC in the SLERA. Mr. Pound stated that when selecting the ERA receptor, benthic organisms and fish were excluded since lead shot had not dissolved in the water column and consequently was not bioavailability. Shorebirds were not also excluded because lead shot is not present at the surface for at least 80 feet from the shoreline. Diving bird such as a grebe was not considered because they selectively feed by plucking at prey items and would not be exposed to lead shot. However, a benthic diving bird such as the greater scaup and surf scoter may ingest lead shot while straining sediment for available grit to be retained in their crop. Therefore, the greater scaup and surf scoter were selected as receptors in the ERA.

In order to determine the acceptable lead shot that may be retained by diving birds, an extensive literature search was performed. Based on the studies conducted, it was found that numerous factors affect the uptake and toxicity of lead shot such as sex, age, feeding habits, and rate of retention of lead shot in the gut. The diet of the bird was found to have the largest impact in

determining the amount of lead shot that a diving duck may retain without being impacted. Mr. Pound stated that previous studies where one lead shot was found to be lethal were based on birds that were fed poor diets. At Alameda Point, diving ducks have a high protein and calcium rich diets due to the availability of mollusks. Using a study were mallard ducks were fed duck food, no adverse effects were observed when the duck retained five No. 4 lead shot, which would be equivalent to nine No. 7.5 or 13 No. 9 lead shots. Because of the relevance of this study based on the species used and the type of diet, it was determined that the recommended allowable number of lead shot in a bird's gut that would not cause adverse effects is nine lead shot pellets in the No. 7.5 to 9 shot size.

Ms. Smith asked if birds from the Skeet Range were actually captured and forced to regurgitate their stomach contents to determine the number of pellets retained in their crop. Mr. Pound stated that such activities were not conducted.

Using the information discussed previous, the population risks were determined using a binominal probability model based on the initial conservative assumptions presented in the SLERA. Jim Haas from the USFWS was consulted in developing the site-specific probability model used to estimate the likelihood that a bird would either ingest grit or lead shot at each sampling station. A range of values (minimum, middle, and maximum) was used to model grit ingestion rates, number of probes, site use factors (SUFs), and grit retention time. The combination of these factors produced 27 different scenarios. Based on conversations with Mr. Haas, an acceptable risk level of 10^{-3} was used in the assessment, which is relatively conservative given that the natural mortality rate of these birds is approximately 40% in the environment. When middle and minimum range values for grit ingestion rates, number of probes, SUFs, and grit retention time per station were used in the model; no stations exceeded the risk level of 10^{-3}. However, when the maximum values for these factors were used, half of the scenarios had risk probabilities above 10^{-3} at the 0 to 5 centimeter (cm) and 0 to 10 cm depths.

Based on the results of the SLERA, the BERA was conducted by weighing the areas of each sampling station over the entire boundary of the Skeet Range. It was assumed that a bird would not spend its entire foraging time at one specific station, but rather that it would spend portions of its time across the entire site. Using a range of exposure assumptions from the SLERA, four of 27 potential scenarios resulted in unacceptable risk above 10^{-3}. These scenarios that exceeded the 10^{-3} risk level were based on a conservative SUF of 10 percent. Mr. Pound stated that based on home ranges for these receptors, a typical SUF for greater scaups is 0.4 percent and for surf scoters is 1 percent. Mr. Pound explained that no unacceptable risk to diving birds was found when reasonable site-specific exposures factors were used. Therefore, the conclusion of the ERA was that no unacceptable risk to diving birds from ingestion of lead shot was found when reasonable site-specific exposure factors were used.

Mr. Reilly asked Mr. Pound to explain the meaning of the term "site use factor". Mr. Pound used the following example to illustrate the meaning of the term. If a bird's foraging range is 10 miles by 10 miles (100 square miles [mi^2]), it is likely that the bird will spend equal amount of time anywhere within that range. If the Skeet Range comprises only 1 mi^2 of that home range, the probability that the bird would be in the Skeet Range at any given time is 1 percent. The exceedances above the acceptable risk level were only encountered when the maximum SUF of 10 percent were used.

Although PAHs were detected in sediment, they were not evaluated in the ERA since they were found to be consistent with ambient concentrations across the Bay. Although the presence of worm mats was not considered in the ERA, it was found that the mats reduce the availability of COPECs to diving birds. Also, the four scenarios that exceeded the 10^{-3} risk level were driven by the maximum SUF of 10 percent. Calculations based on reasonable exposure assumptions showed no unacceptable risks to diving birds from ingestion of lead shot.

Mr. Pound then continued the presentation with a summary of the findings from the human health conceptual site model. Based on current and future site use, there are no direct contact exposure pathways in which receptors may be potentially exposed to impacted sediment. No moorings or piers are available for boat docking at the Skeet Range. Current access to the site through Alameda Point is restricted to Navy authorized personnel only and beach areas contain riprap and concrete remnants. Future use includes open space and/or a recreational park. Because the majority of the contaminants are located 80 to 100 feet from the shoreline and are located 10 feet below water surface, no future direct contact exposure is anticipated. Based on these findings, it was concluded in the RI that no further human health evaluation is warranted.

Mr. Morgan asked what the depth of the water is 80 feet from the shore. Mr. Pound answered it is approximately five to 10 feet deep based on the recent bathymetry mapping. Ms. Smith then asked what depths the samples were collected from. Ms. Lau answered that 100 cm deep cores were collected.

Mr. Morgan questioned whether studies conducted at other shooting ranges might be utilized in this assessment. Ms. Lau provided various examples of where similar studies have taken place, such as Clipper Cove at Treasure Island, Castro Cove in Richmond, Peninsula Gun Club near San Mateo Bridge, and Remington Gun Club in Connecticut, and added that the probability model used at the Skeet Range is unique due to the types of birds being evaluated and the site conditions. Mr. Leach provided an example of a study done on copper coated steel and the effects it had on ducks.

Mr. Pound asked if there is any interested in having a focus group meeting to discuss the Skeet Range RI further. The attendees stated that a meeting was not necessary and asked if questions may be directed to Mr. Pound after they had an opportunity to review the report. Mr. Pound agreed that questions might be sent to him for clarification.

Neil Coe asked if water currents would have any effect on the amount of exposure the birds would have to lead shot. Mr. Pound stated that the water currents had minimal impact on the transport of lead shot in the surface sediment and has not resulted in a situation where more lead shot was exposed. Because of the conservative approach used in the assessment, it is likely that the model overestimates the amount of time lead shot is in the area.

Marcia Liao, DTSC, asked if it is possible that the lead shot had corroded. Ms. Lau stated that Tetra Tech EMI conducted a dissolution study of lead shot and found that the dissolved lead concentrations were below ambient water quality criteria. Mr. Leach added that because the majority of the lead shot is located in the subsurface sediment, it is likely that the lead shot had not significantly degraded or corroded due to the anoxic conditions from lack of oxygen. Without oxygen, the lead shot cannot oxidize. There was a general agreement that the depositional environment explains the absence of oxidation.

VI. Base Realignment and Closure Cleanup Team (BCT) Activities

Mr. McClelland provided the following information from the February 18, 2003, BCT meeting:

- The Navy provided an update on the status of the fiscal year 2003 funding.
- There was a status update for ongoing removal actions. The Sites 9 and 16 removal action will go to full-scale and further remedial activity at Sites 11 and 21 will be deferred until the final remedial action.
- There was a discussion of the southern portion of Site 26 being transferred to the TPH program.
- The Navy presented the proposed approach for the operable units (OU) -1, -2A, -2B ERA. With all locations being urban landscapes, it was agreed to proceed with the standard 3-tiered approach.
- The BCT visited Site 28 and discussed the ERA. This involved a lengthy discussion of the presence of copper in groundwater.
- The Navy provided an update to the economic development conveyance (EDC) -5 removal action schedule. The workplan will be based on the workplan for the OU-5 removal action. New landscaping alternatives may be evaluated. Pre-removal sampling will be conducted.

In addition, the BCT held a conference call to discuss the approach for the removal actions at Sites 9 and 16. A modified Fenton's approach was selected; it involves hydrogen peroxide (H_2O_2) and a chelated iron (Fe) complex catalyst that could be implemented at a neutral groundwater pH. This approach results in a low exothermic reaction, no generation of harmful byproducts, and a reduction of chlorinated hydrocarbon concentrations anywhere from 60 to 90 percent.

VII. Community and RAB Comment Period

Patrick Lynch stated that he would like someone to review the Navy's document retention policy and policies on maintaining the administrative record because a great deal of materials have been removed from the RAB Information Repository (Repository). Mr. Lynch stated that he has picked up recent documents such as RIs and FSs that reference documents from the 1980s that are not available. Mr. Lynch also stated that he is concerned by the fact that he cannot find a document or a person capable of explaining why a TCRA was conducted at Site 2. He stated that TCRAs and removal actions should be warranted based on fundamental health issues.
Mr. Lynch stated that if the chemical oxidation treatability studies are successful, then they should be documented in an FS and a record of decision (ROD) should be prepared. Mr. Lynch expressed that he is concerned with not being afforded the opportunity to comment on selected remedies. He provided an example of an instance where air monitoring was conducted.
Mr. Lynch stated that he would like to see a final workplan and a final health and safety plan before work is conducted on site. Mr. Lynch requested that the Navy and the Agencies follow all state and federal laws during the CERCLA process.

In response to Mr. Lynch's comments, Mr. McClelland stated that the chemical oxidation studies at Sites 9, 11, 16, and 21 were not conducted as TCRAs. Engineering evaluation/cost analysis and action memorandum both followed by the appropriate public comment periods were submitted. In response Mr. Lynch asked why 20 years of investigation was conducted to conclude that there has been a public health hazard all along. Mr. Lynch also stated that the EPA has just determined that benzo(a)pyrene has a higher risk to children than adults, and therefore, Mr. Lynch feels that every site where PAH cleanup has occurred should be revisited. Mr. Lynch stated that he would like to see a ROD for every removal action that has been conducted.

Ms. Smith asked if the City is responsible for maintaining the Repository. In response, Mr. McClelland stated that it is the Navy's responsibility to maintain the Repository. Ms. Smith also expressed her concern of the Repository not being actively maintained as she has looked for documents and found them missing as well. She then added that because Steve Edde no longer maintains a full time office at Alameda Point, there is no way to watch the Repository. Later in the conversation, Mr. Dick stated that the Navy is working to put all documents on disk and Mr. McClelland stated that they had a request from Regional Water Quality Control Board (RWQCB) to make documents available both electronically and in hard copy.

Ms. Smith then listed a few examples of decisions that were made where the public did not get a chance to follow up on the issues resolutions. These examples were the TCRA that was planned for the Woodstock Daycare and using dredged sediment from SPL to contour the proposed golf course. Mr. Ripperda stated that the Navy meets with the RAB co-chairs every month to determine the agenda for the next RAB meeting, and if there is something the community would like to add to the agenda, then they should contact their co-chairs. Mr. Ripperda also suggested creating a new forum for submitting questions to the Navy prior to the RAB meeting each month. This would allow the Navy to be prepared to answer the community's questions.

Mr. Lynch and Ms. Smith again expressed their concern that the library is not being maintained properly. Mr. Lynch stated that older documents are being replaced with new documents in the Navy's tracking system and therefore the administrative record is not being maintained as required by law. Mr. McClelland stated that Navy will look into the issue and he asked if the document record at the main Alameda Library is complete. Mr. George Humphreys stated that the main Alameda library is probably complete and the logbook in the Repository is incomplete. Updating the Repository was made an action item.

Mr. Morgan reminded RAB members that the monthly meetings are scheduled to begin promptly at 6:30 p.m., and requested that they arrive on time for all future meetings.

The meeting was adjourned at 8:55 p.m.

ATTACHMENT A

NAVAL AIR STATION ALAMEDA
RESTORATION ADVISORY BOARD MEETING AGENDA
March 4, 2003

(One Page)

RESTORATION ADVISORY BOARD

NAVAL AIR STATION, ALAMEDA

AGENDA

4 MARCH, 2003 6:30 PM

ALAMEDA POINT – BUILDING 1 – SUITE 140

COMMUNITY CONFERENCE ROOM

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

MEETING MINUTES AVAILABLE ONLINE AT:
WWW.EFDSW.NAVFAC.NAVY.MIL/ENVIRONMENTAL/ALAMEDAPOINT.HTM

TIME	SUBJECT	PRESENTER
6:30 - 6:35	Approval of Minutes	Bert Morgan
6:35 - 6:45	Co-Chair Announcements	Co-Chairs
6:45 - 7:30	Site 2 OEW & Geotech Report	Rick Weissenborn
7:30 - 8:10	Site 29 (Skeet Range) RI Report	Michael Pound
8:10 - 8:20	BCT Activities	Mike McClelland
8:20 - 8:30	Community & RAB Comment Period	Community & RAB
	RAB Meeting Adjournment	
8:30 - 9:00	Informal Discussions with the BCT	

ATTACHMENT B

NAVAL AIR STATION ALAMEDA
RESTORATION ADVISORY BOARD MEETING SIGN-IN SHEETS

(Four Pages)

ALAMEDA POINT
RESTORATION ADVISORY BOARD
Monthly Attendance Roster for 2003

Date: March 4, 2003

Please initial by your name

RAB MEMBERS	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Ingrid Baur												
Clem Burnap												
Ardella Dailey			*									
Nick DeBenedittis												
Douglas deHaan	X		X									
Tony Dover		X										
George Humphreys	X	X	X									
James D. Leach	X	X	X									
Jo-Lynne Lee												
Lea Loizos	X	X	X									
Bert Morgan	X	X	X									
Ken O' Donoghue												
Kurt Peterson			X									
Kevin Reilly	X	X	X									
Bill Smith		X										
Dale Smith	X	X	X									
Lyn Stirewalt												
Jean Sweeney	X	X										
Jim Sweeney	X	X	X									
Luann Tetirick	X											
Michael John Torrey	X	X	X									

COMMUNITY MEMBERS	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Neil Coe		X	X									
Debbie Collins	X		X									
Golden Gate Audubon Society												
Betsy P. Elgar												
Dana Kokubaun												
David Rheinheimer												
REGULATORY AND OTHER AGENCIES	**JAN**	**FEB**	**MARCH**	**APRIL**	**MAY**	**JUNE**	**JULY**	**AUG**	**SEPT**	**OCT**	**NOV**	**DEC**
Anna-Marie Cook (EPA)	X											
David Cooper (EPA)		X	X									
Merry Goodenough (USCG)												
Judy Huang (RWQCB)	X	X	X									
Elizabeth Johnson (City of Alameda)	X	X	*									
Marcia Liao (DTSC)	X	X	X									
Laurent Meillier (RWQCB)												
Mark Ripperda		X										
Patricia Ryan (DTSC)	X	X										
Sophia Serda (EPA)												
Michael Shields (USCG)	X	X	X									

* Denotes excused absense

U.S. NAVY	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Glenna Clark												
Andrew Dick	X	X	X									
Steve Edde		X	X									
Greg Lorton												
Mike McClelland	X	X	X									
Tom Pinard	X	X	X									
Rick Weissenborn	X											
TETRA TECH EMI	**JAN**	**FEB**	**MARCH**	**APRIL**	**MAY**	**JUNE**	**JULY**	**AUG**	**SEPT**	**OCT**	**NOV**	**DEC**
Courtney Colvin	X	X	X									
Tracy Craig												
Corinne Crawley												
Chris Fennessy												
Jim Helge												
Craig Hunter												
Marie Rainwater												
Leah Waller												
Heather Imgrund			X									

* Denotes excused absense

OTHER	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Janet Argyres-Bechtel												
Aidan Barry - APCP												
Bart Draper-Bechtel												
Lee Dodge - LFR												
Bill Howell - 3-D Environmental												
Rezsin Jaulus-Alameda Point Coll.	X											
Eric Johansen - Bechtel												
Bruce Marvin - IT, Aquifer Solutions												
Stephen Quayle-Bechtel												
Ron Rinehart, Pacific States												
Kent Udell	X											
Charlene Washington-EBCRC												
Abid Loan-Foster Wheeler			X									
Jim Barse			X									

* Excused absence
** Attended but did not sign roster

ATTACHMENT C

NAVAL AIR STATION ALAMEDA
RESTORATION ADVISORY BOARD MEETING HANDOUT MATERIALS

Alameda Point Site 2 OEW and Geotechnical Report. Presented by Abid Loan, Foster Wheeler. March 4.

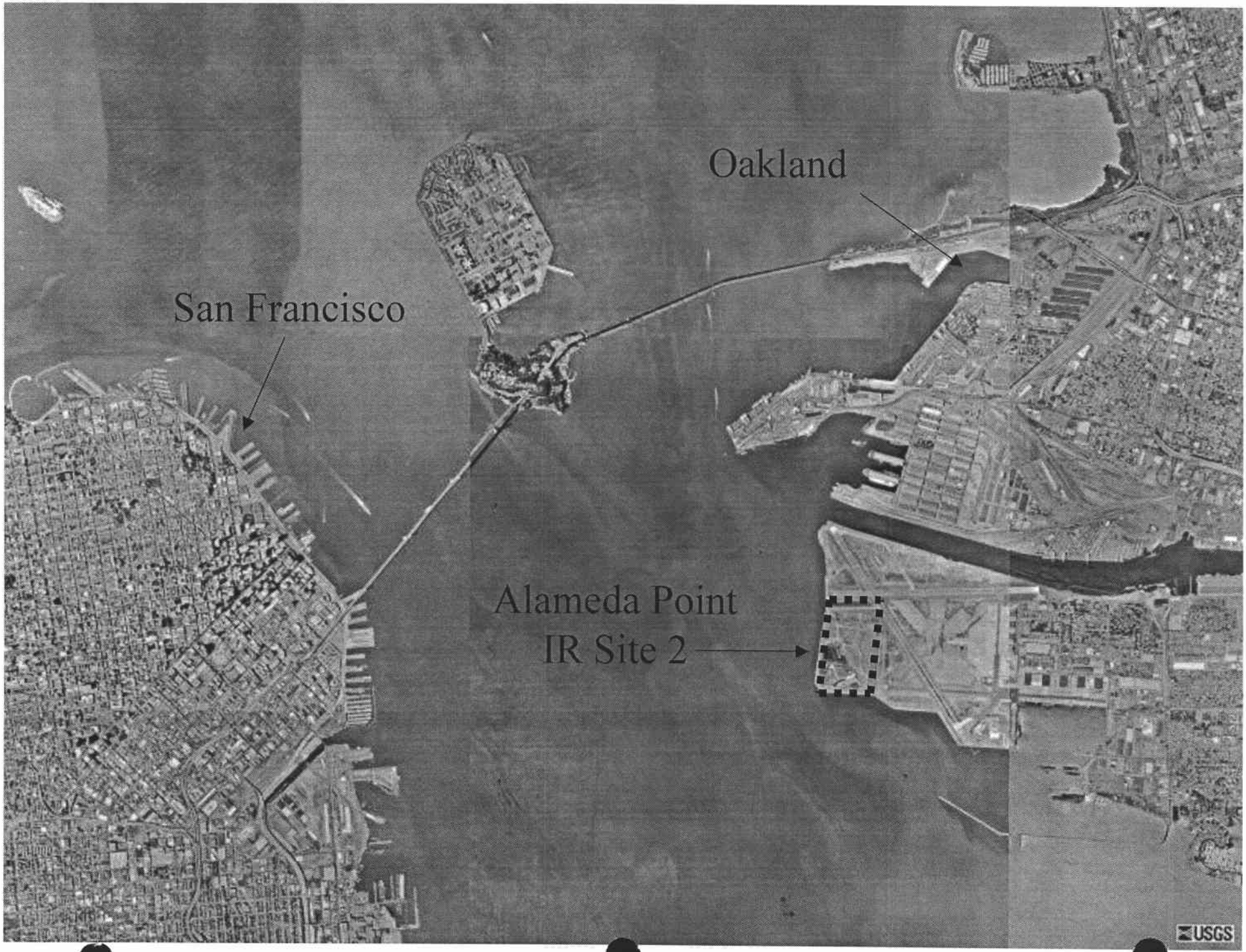
Alameda Point Skeet Range Remedial Investigation Overview, 2003. Presented by Michael Pound, Department of the Navy, Deputy Chief Environmental Engineer, Naval Facilities, Southwest Division. March 4.

Alameda Point Site 2 OEW and Geotechnical Report.

(Twenty Pages)

NAS ALAMEDA, INSTALLATION RESTORATION SITE 2

- **PURPOSE**
  - Evaluate subsurface site conditions for future remedial action and associated construction activities (landfill cap)
- **OBJECTIVE**
  - Location, identification and removal of Ordnance and Explosives Waste (OEW)
  - Characterize existing soil covers
  - Identify seismic hazards
  - Perform preliminary engineering analysis
- **SCOPE**
  - Ordnance and Explosive Waste (OEW) Characterization and Time Critical Removal Action
  - Geotechnical and Seismic Investigation
  - Geotechnical Feasibility Study


Oakland
San Francisco
Alameda Point
IR Site 2
USGS

INSTALLATION RESTORATION SITE 2 BACKGROUND

PROJECT SITE

- IR Site 2 - 110 acres total, includes an additional investigation area between IR Sites 1 and 2 formerly used as a runway
- Portion of IR Site 2 (~77 acres) was used as a waste disposal area for NAS Alameda between 1956 to 1978
- Wetland area identified within IR Site 2 (~30 acres)
- IR Site 2 to be transferred to USFWS for use as a national wildlife refuge following design and construction of the recommended remedial alternative

ORDNANCE AND EXPLOSIVES WASTE (OEW) CHARACTERIZATION AND EMERGENCY REMOVAL ACTION

SCOPE

- Location, identification and removal of any OEW on the ground surface within boundaries of IR Site 2
- Removal of OEW below the ground surface from the Possible OEW Burial Site located within IR Site 2

KEY WORK ELEMENTS

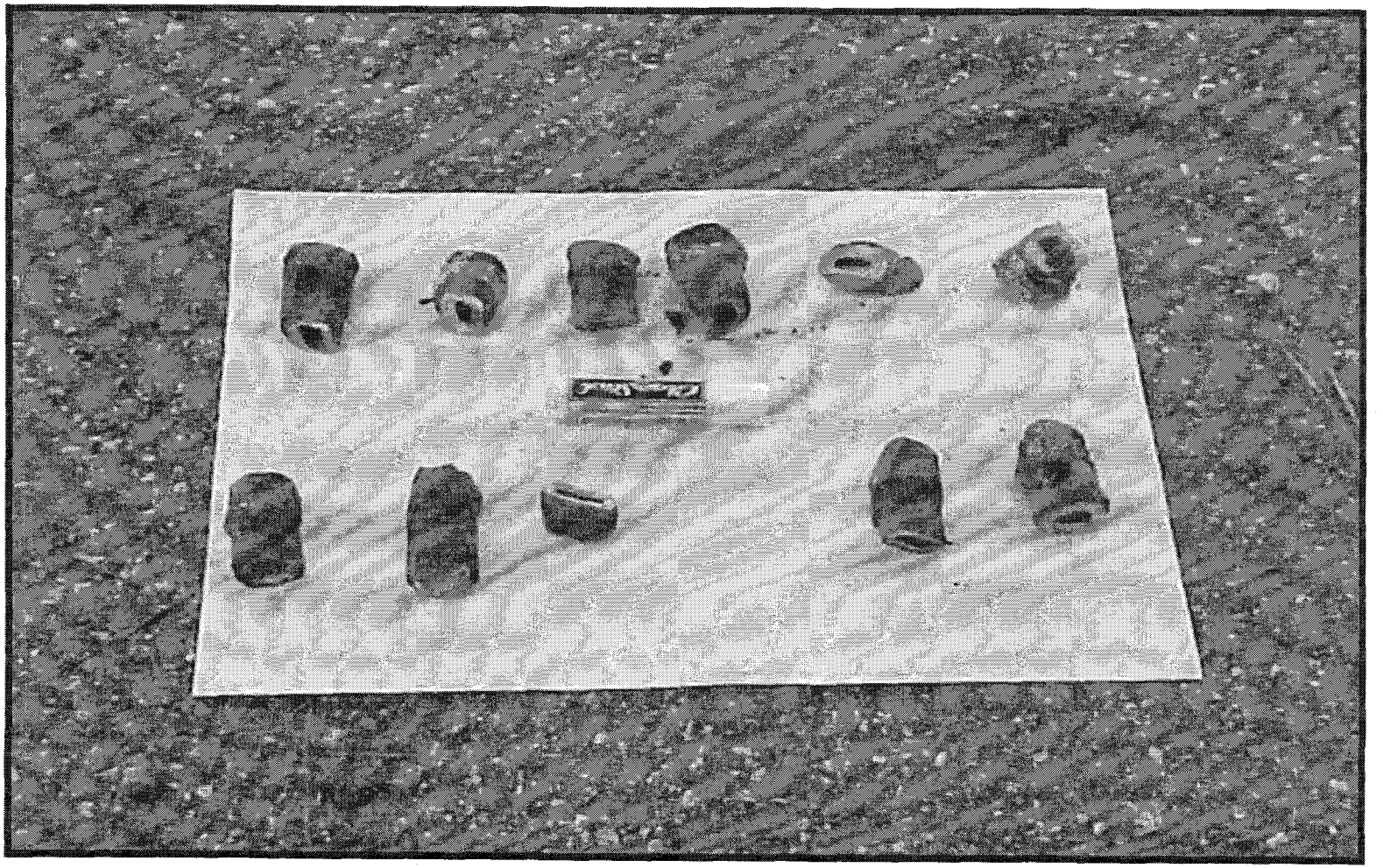
- OEW Surface clearance
- OEW Below surface clearance (Time Critical Removal Action)

OEW SURFACE CLEARANCE

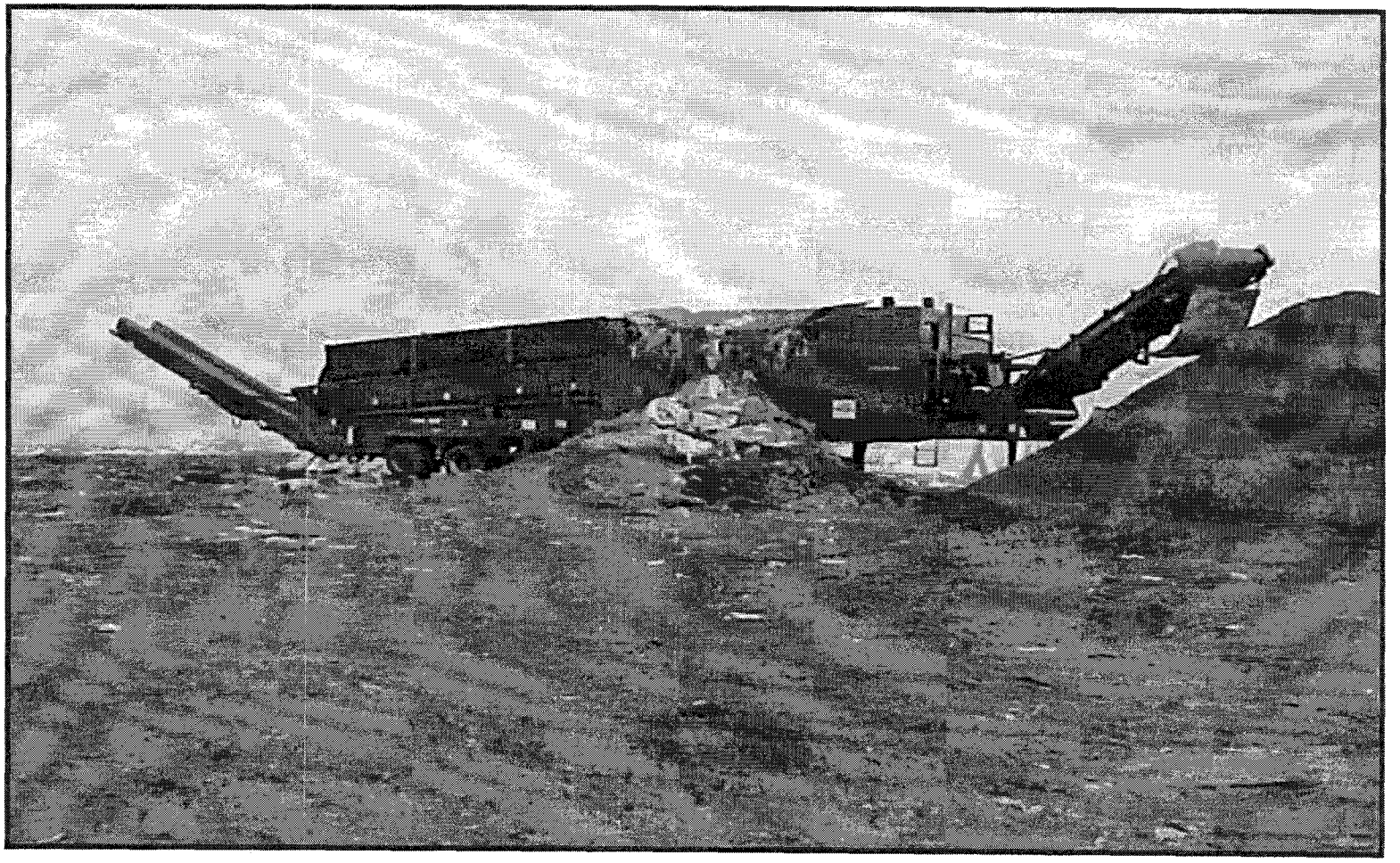
- **Visual reconnaissance**
  - Access roads, staging areas and support zones
- **Vegetation removal to facilitate location of surface OEW**
- **Grid-by-Grid Surface Sweep**
  - Site grid established for ordnance characterization
  - 200-foot by 200-foot surveyed grid
  - Locations of items identified by northing and eastings distances
- **Establishment of Exclusion Zones (EZ)**
  - Identification of where explosive hazards are likely to be present
  - Most Probable Munition (MPM) identified that might be encountered at IR Site 2
    - 20-mm high explosive projectile

TECHNICIANS PERFORMING SURVEY OF SITE GRIDS FOR SURFACE SWEEP

DEMILITARIZED 20-MM TRAINER ROUNDS



TROMMEL PERFORMING SOIL SIFTING AT POSSIBLE OEW BURIAL SITE



OEW BELOW GROUND SURFACE CLEARANCE (TCRA)

- **Possible OEW Burial Site ~ 2.5 acres**
- **Excavation below ground surface to depth of 1 foot**
  - Technicians sweep excavation path with mine detectors
    - Significant magnetic anomalies removed
  - Soil removed in 6-inch lifts, one grid at a time
    - Technicians visually verified and monitored all cuttings for OEW
  - Mechanically screened to separate trash and debris
  - Screened soil used for backfill
    - Tailings visually inspected by technicians for presence of OEW prior to backfill placement
  - OEW recovered was demilitarized and disposed of as non-hazardous waste

GEOTECHNICAL AND SEISMIC INVESTIGATION

- **KEY WORK ELEMENTS**
  - Field Investigation
  - Geotechnical Soil Testing
  - Geotechnical and Seismic Analysis

FIELD INVESTIGATION

- ON-SHORE AND OFF-SHORE DRILLING
- EXPLORATORY TEST PITS
- CONE PENETROMETER TESTING
- TOPOGRAPHIC AND BATHYMETRIC SURVEYS
- WETLANDS DELINEATION

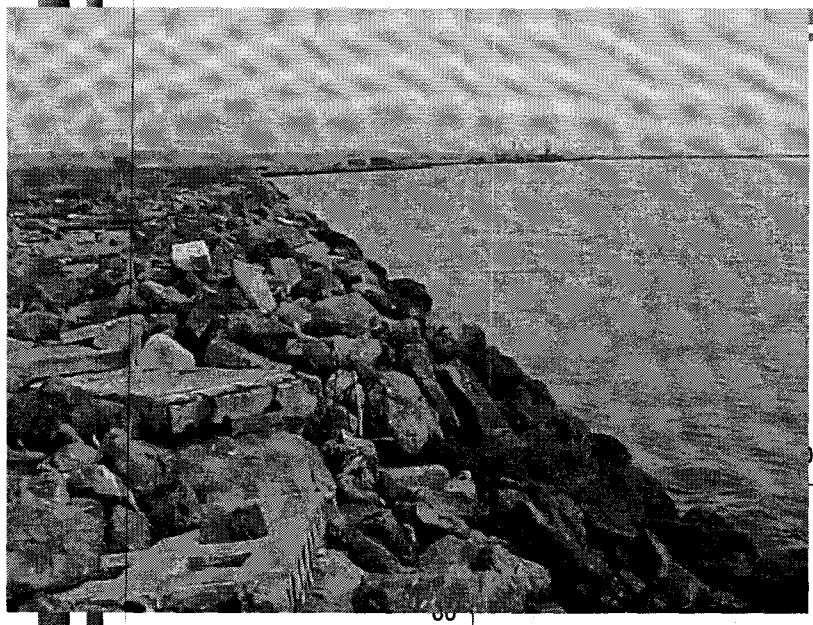
GEOTECHNICAL SOIL TESTING

- STRENGTH PARAMETERS
- SOIL CLASSIFICATION
- SETTLEMENTS
- BEARING CAPACITY

GEOTECHNICAL AND SEISMIC ANALYSIS

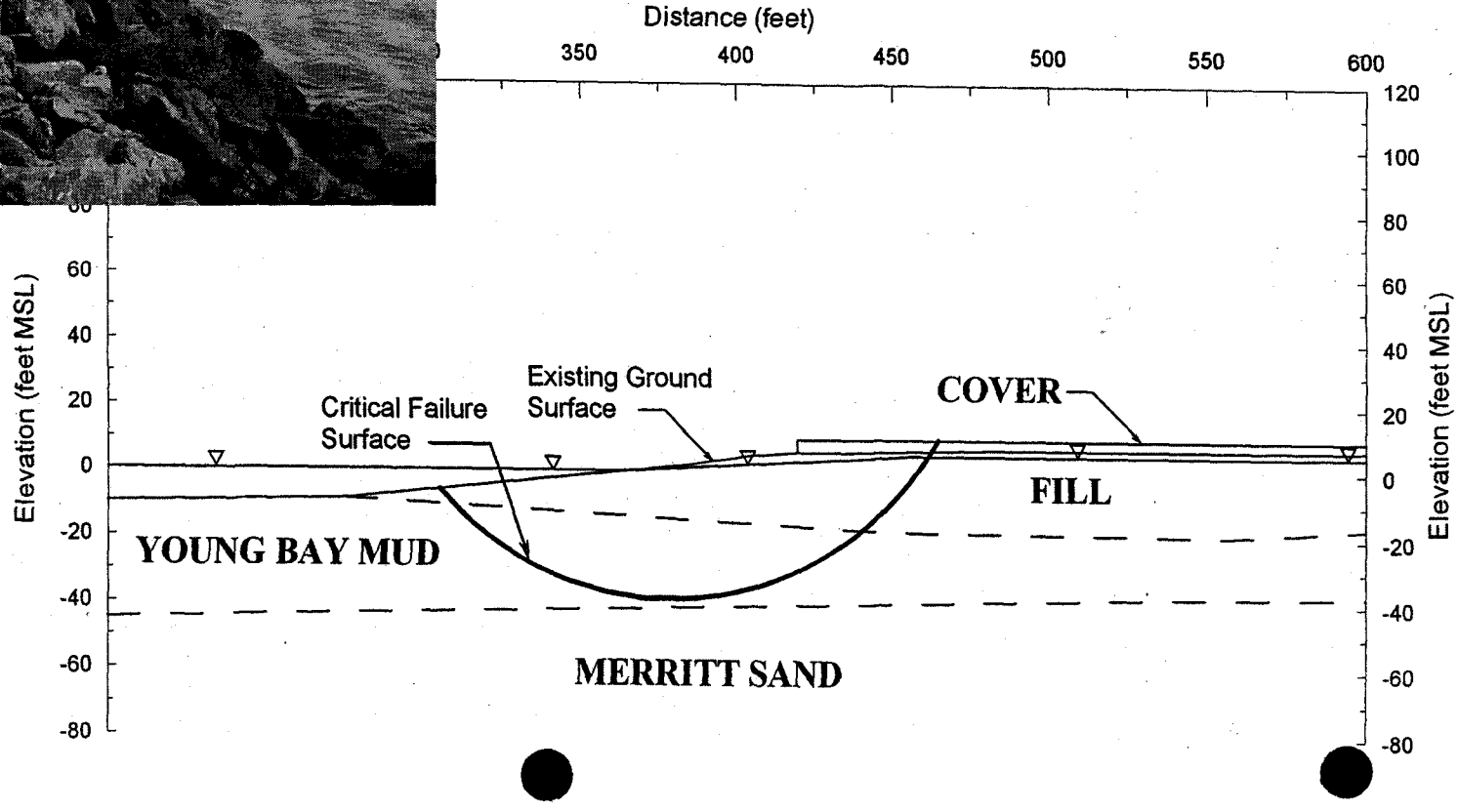
- LIQUEFACTION EVALUATION
- SLOPE STABILITY
- GROUND RESPONSE ANALYSIS

PERIMETER SLOPES AND POTENTIAL SLOPE FAILURE AT IR SITE 2

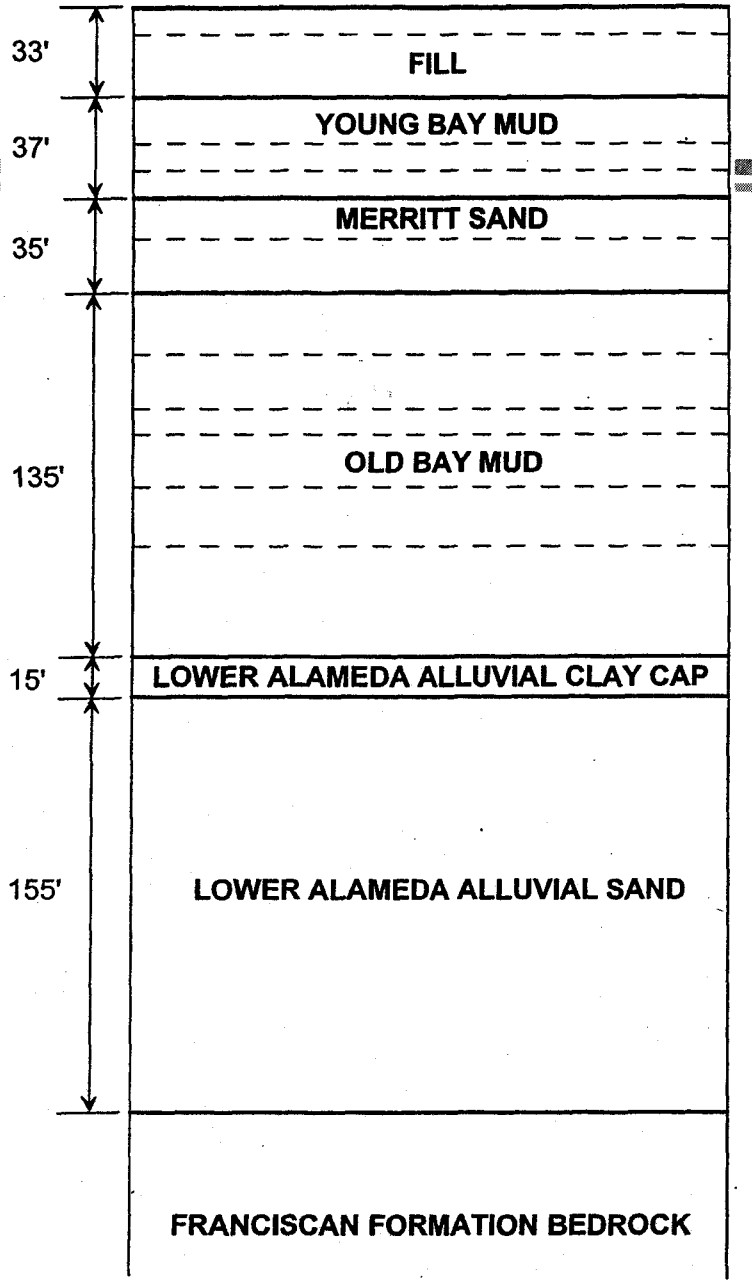


PERIMETER SLOPE AT IR SITE 2

POTENTIAL SLOPE FAILURE (TYPICAL)



Subsurface Profile for Ground Response Analysis



GEOTECHNICAL AND SEISMIC HAZARDS IR SITE 2

- **LIQUEFACTION POTENTIAL**
  - Fill material classified as liquefiable
  - Seismically-induced settlements estimated up to 18 inches (Generally accepted differential settlement of structures < 1 inch)
  - Liquefaction-induced lateral displacements approximately 20 ft. (Generally accepted lateral displacements < 1 ft.)

- **SLOPE INSTABILITY (with soil cover)**
  - Static FS between 1.46 and 2.58 (State of practice, Factor of Safety > 1.5)
  - Post-EQ static FS between 0.86 and 1.94 (USACE guidelines, Factor of Safety > 1)
  - Predicted permanent lateral deformations of 4 to 19 ft. (Generally accepted lateral displacements for slopes supporting structures < 6 inches)

GEOTECHNICAL FEASIBILITY STUDY (FS) AT IR SITE 2

OBJECTIVE

- Prevent release of waste into San Francisco Bay

PERFORMANCE CRITERIA

- Limit permanent lateral displacements to 4 feet

EVALUATE REMEDIAL ALTERNATIVES

- CERCLA Guidelines and EPA Screening Criteria Identified
- General Response Actions - (1) Soil improvement and (2) Physical buttresses
- Developed 20 remedial alternatives

PROPOSED ALTERNATIVES

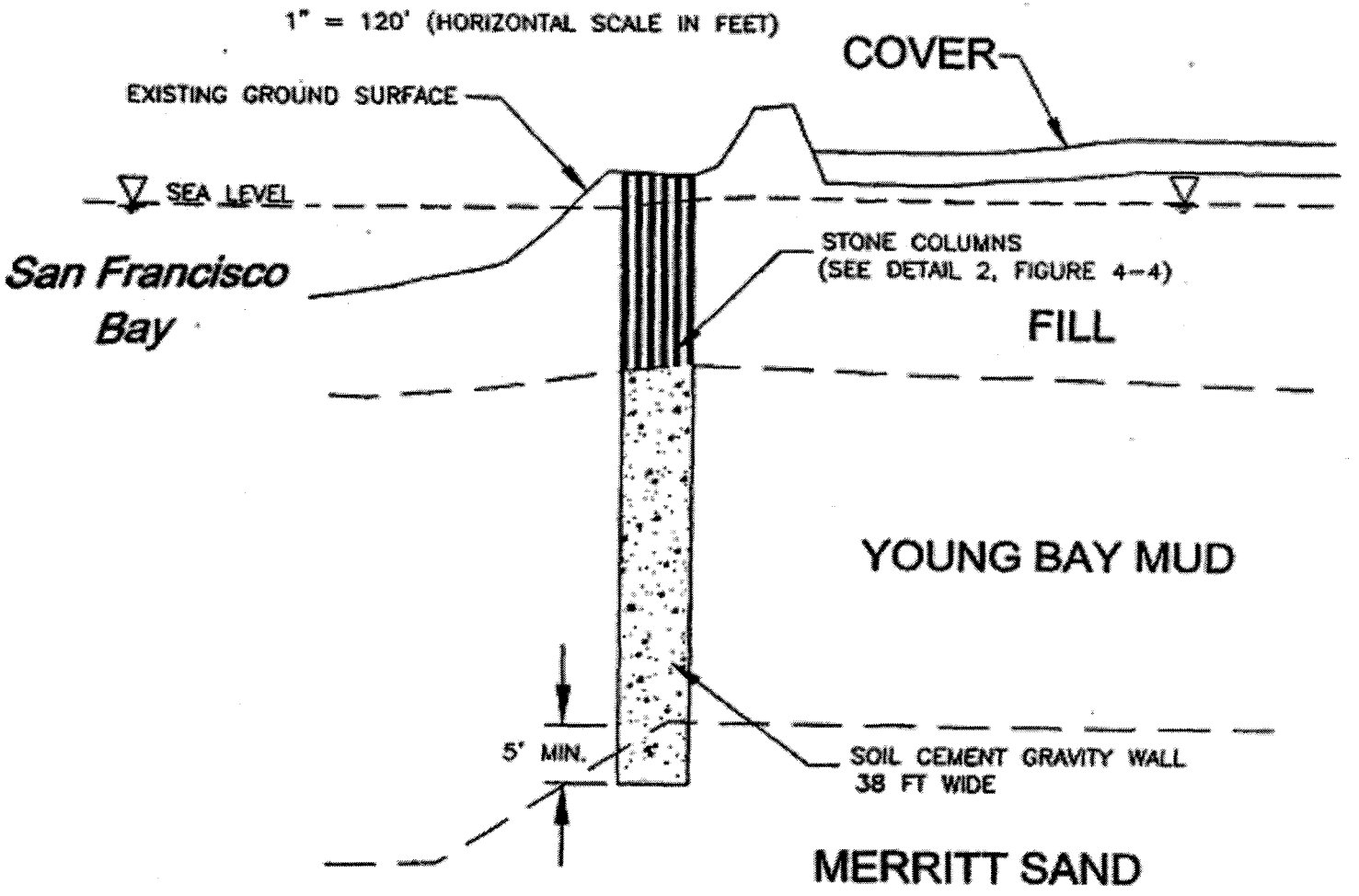
Alternative No.	Description	Type of Response Action		
		Soil Improvement	Physical Buttress	Combined Method
1	Wick Drains with Surcharge	X		
2	Stone Columns with Surcharge	X		
3	Sheet Piles with Anchors		X	
4	Stone Columns with Surcharge and Sheet Piles			X
5	Soil Cement Gravity Wall and Stone Columns	X		
6	Concrete Wall		X	
7	Excavation with Riprap		X	
8	Drilled Concrete Piers with Stone Columns			X
9	Pre-cast Concrete Piles		X	
10	Wick Drains with Surcharge and Sheet Piles			X
11	Excavation along Shoreline and Soil Backfill	X		
12	Partial In Situ Solidification	X		
13	Soil Bentonite Cutoff Wall		X	
14	Riprap Embankment in the Bay and Soil Backfill	X		
15	Inclined Timber Piles		X	
16	Consolidation with Surcharge	X		
17	Wick Drains with Vacuum	X		
18	Vibrated Beam Cement Bentonite Cutoff Wall		X	
19	Vibrated Beam Impermix Cutoff Wall		X	
20	Soil Cement Gravity Wall			X

SELECTED REMEDIAL ALTERNATIVES AT IR SITE 2

RECOMMENDED ALTERNATIVE

- Alternative #5: Soil Cement Gravity Wall and Stone Columns
  - Construction of a 17- to 38- foot wide soil cement gravity wall in the Young Bay Mud layer and installation of stone columns in the fill layer
  - Provides for reduction of liquefaction potential and containment of liquefiable soils behind the improved soil zone

SOIL CEMENT GRAVITY WALL WITH STONE COLUMNS



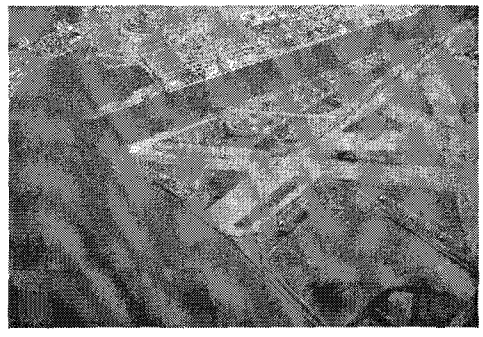
Alameda Point Skeet Range Remedial Investigation Overview, 2003

(~~Seven~~ Pages)
Eleven

Alameda Point
Skeet Range Remedial Investigation Overview

RAB Meeting

March 4, 2003



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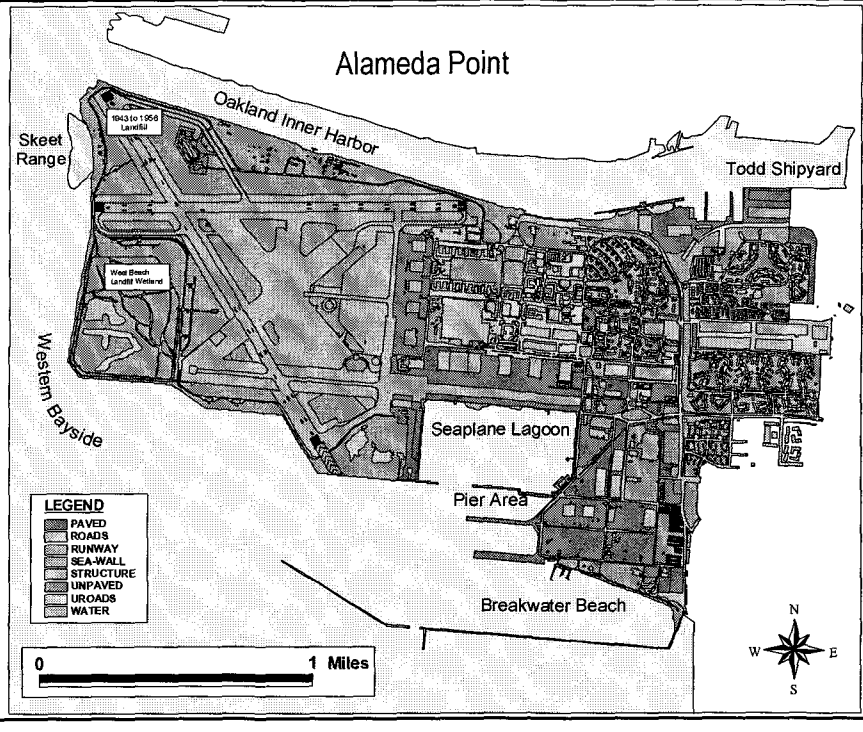
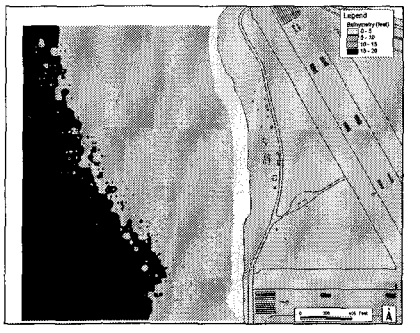


Skeet Range History

- Dredged spoils used as fill material to create the current topography
- Active shooting range for approximately 30 to 40 years until closure in 1993.
- Majority of the lead shot located in sediments at approximately 5 to 10 feet below mean low water.
- Contaminants of concern include PAHs (petroleum binding agents used in manufacturing clay targets) and lead shot.



3

Objectives of RI

- Describe the distribution of lead shot in the surface and subsurface
- Determine if PAHs come from clay targets and estimate sediment accumulation rates
- Present the methods and results of the ecological risk assessment
- Present the conceptual site model to identify potential human health exposures
- Delineate areas that pose an unacceptable risk to human health and the environment and require evaluation in the Feasibility Study (FS)
- Propose preliminary acceptable lead shot levels in sediment that are health protective of human and ecological receptors

4

Findings from RI

- Majority of the lead shot was found in 5 to 10 feet below mean low water
- No degradation, decay, or decomposition of lead shot was observed – all lead samples were retained in their original shot form
- Diving birds may ingest lead shot as grit to break up food
- Using a model to predict the probability of lead shot uptake by birds, potential risk to diving birds was below the risk threshold when reasonable exposure assumptions were used

5

Findings from RI (continued)

- PAHs were used in binding agents to manufacture clay targets
- PAHs in sediment were not the same as PAHs in clay targets using fingerprinting techniques
- PAHs were found to be consistent with ambient levels with slightly higher concentrations near the mouth of Oakland Inner Harbor in the subsurface sediment

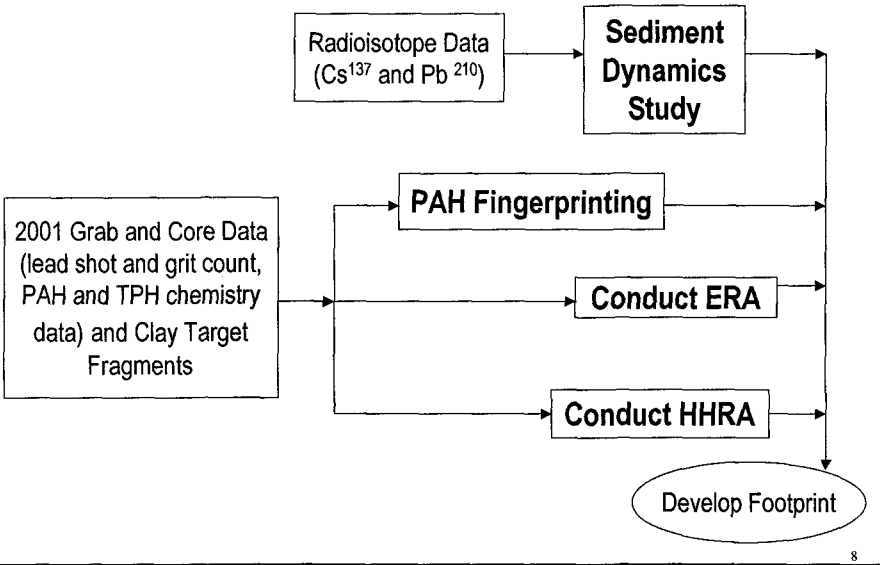
6

Findings from RI (continued)

- No lead shot was found in the surface at nearshore sampling stations (80 to 100 feet from shoreline)
- No complete direct exposure was determined for current and/or future recreational user

7

RI Methodology



8

PAH Fingerprinting Analysis

- Clay fragments were not uniformly distributed in sediment, but found in two clusters (northern and southern)
- Based on the Principal Component Analysis, sediment samples were chemically distinct from the chemical composition found in clay target fragments
- PAH fingerprints from clay targets were not detected in the sediment samples where they were collected
- PAH concentrations in sediment were uniformly distributed both laterally and with depth including areas beyond the fragment fall zone

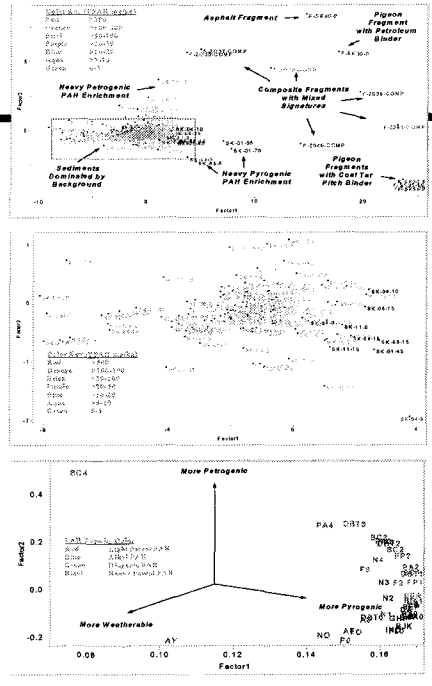
Clay targets are not the source of PAHs in sediment

9

A

B

C



10

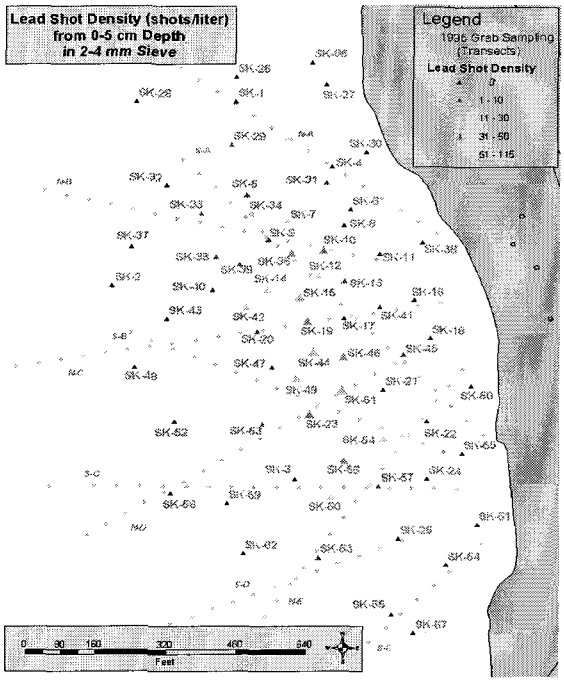
Sediment Dynamics Study

- 3 cores were collected and analyzed for radioisotopes Pb^{210} and Cs^{137}
- Average sediment accumulation rate was estimated between 0.65 and 1 cm/year
- The presence of worm mats in the Skeet Range offshore indicates that it is a depositional environment, but are periodically broken up by storm events and recolonize
- Lead shot is not moved significant distance and follows the trajectories of the shooting ranges

11

Example of Worm Mats at the Skeet Range

12



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Ecological Risk Assessment

In accordance with US EPA and Navy Guidance, the ERA was conducted following a two-tiered process:

- Screening-level ERA (SLERA) – screening based on conservative benchmarks and exposure assumptions
- Baseline ERA (BERA) – use site-specific exposure assumptions and refined exposure concentrations

14

SLERA

- Identify COPECs
  - Lead shots were not degraded, decayed, or decomposed
  - Lead shots were identified as COPECs
- Selecting Receptor of Concern
  - Benthic invertebrates and fish are not expected to be exposed to lead shot due to limited bioavailability in the water column (no dissolution)
  - Nearshore or shoreline birds are not expected to be exposed to lead shot since there were no lead shot found at the surface for at least 80 feet from the shoreline
  - Species such as grebe that dive 10 feet will feed on fish or pluck prey items – will not be exposed to lead shot
  - Benthic birds that dive 10 feet may ingest lead shot as grit while mucking or straining sediment
  - Greater Scaup and Surf Scoter were selected as species likely to have the highest potential for exposure to lead shot

15

SLERA (continued)

- Determining Acceptable Lead Shot Levels
  - Factors affecting uptake and toxicity of lead shot include type of bird species, sex, age, size, rate of retention of lead shot in the gut, volume of grit ingested, size of lead shot, feeding habits, depth of water, season, pellet size, firmness of substrate, and most importantly, diet (quantity and quality)
  - Previous studies where 1 lead shot was found to cause an effect was based on either wild ducks (stressed) or were fed poor diets
  - Studies where birds were provided a natural diet (rich in high protein and calcium) were used to develop acceptable lead shot levels in diving birds
  - In a study using mallards that were fed duck food, no effects were observed when mallards ingested five no. 4 lead shots
  - Converting the five No. 4 lead shot to No. 7.5 to 9 equivalent (used at Skeet Range), the no effect levels ranged from 9 to 13 lead shots in the No. 7.5 to 9 shot size.

No observed effect level of 9 shot is recommended

16

SLERA (continued)

- Determine Population Risk Using Conservative Assumptions
  - Receptors include scoter and scaup
  - Based on mallard studies, 9 lead pellets were used as the allowable number of lead shot in a bird's gut that would not cause adverse effects
  - A site-specific probability model was developed using binomial probability that estimates the likelihood that a bird may ingest either grit or lead shot at every probe
  - A range (min, middle, and maximum) of values for grit ingestion rates, number of probes, site use factors, and grit retention time per station was used in the model
  - Acceptable risk level of 10^{-3} was used as suggested by USFWS. Scaups and scoters have a 40% mortality rate in nature
  - No stations exceeded the risk level when middle and minimum range of values were used. Using the maximum scenario, half of the scenarios had risk probabilities above 10^{-3} at the 0-5 cm and 0-10 cm depth.

Site Use Factor is driving the risk probabilities

17

BERA

- Assess Effects to Receptors
  - Given the size of the foraging range of diving ducks, it was assumed that birds would forage across the entire site instead of one station
  - Risk probabilities per station were averaged by area
  - Using a range of exposure assumptions, only 4 of the 27 potential scenarios resulted in unacceptable population risk above 10^{-3}
  - All scenarios with unacceptable risks are based on conservative site use factor of 10%. Based on home ranges for these species, a typical SUF is 0.4% for scaups and 1% for scoters.

18

Summary of ERA

- PAHs were not quantitatively evaluated because they do not biomagnify in the food web and because the PAH concentrations are within ambient concentrations for SF Bay
- Worm mats in the surface sediment significantly reduces the availability of COPECs by diving birds
- Only 4 of the 27 spatially weighted average probabilities exceeded the 10^{-3} and all were driven by the maximum SUF of 10%
- No unacceptable risk to diving birds from ingestion of lead shot was found when reasonable site-specific exposure factors were used

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Human Health CSM

- Current Use
  - No direct contact exposures due to restricted Navy access
  - No mooring or pier available for boat docking
  - Beach areas contains riprap and concrete remnants
- Future Use
  - Future development includes open space and/or recreational park
  - No lead shot was found in the surface at nearshore sampling stations (80 to 100 feet from shoreline) and majority of the contaminants are located 10 feet below water surface, no direct contact exposures are anticipated
  - No evidence of biomagnification of PAHs in aquatic food web

No Further Human Health Evaluation Is Warranted

20

Summary of RI Findings

- No unacceptable risk to diving birds from ingestion of lead shot was found when reasonable site-specific exposure factors were used
- No complete direct exposure was determined through the human health CSM based on current and proposed future land use
- PAH concentrations were found to be consistent with ambient levels

Recommendation: No Further Action Determination

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Questions???

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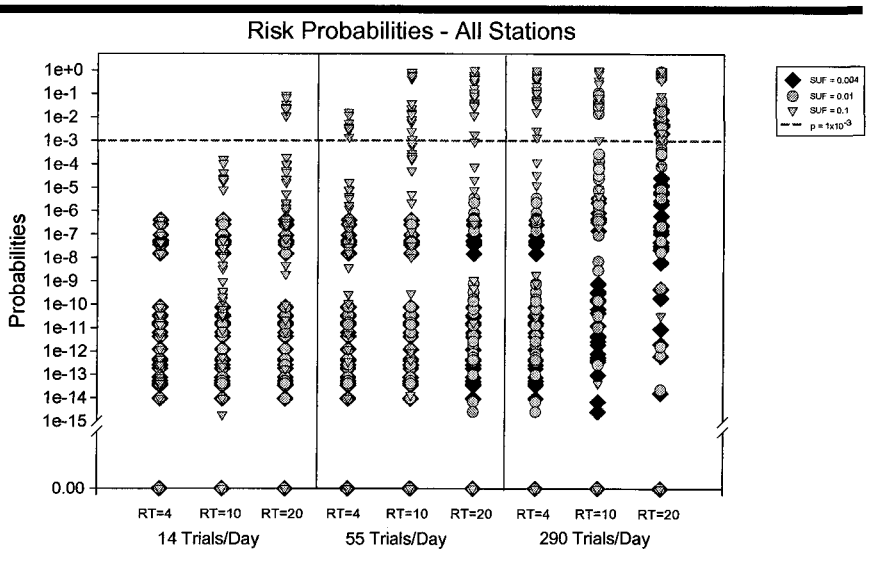
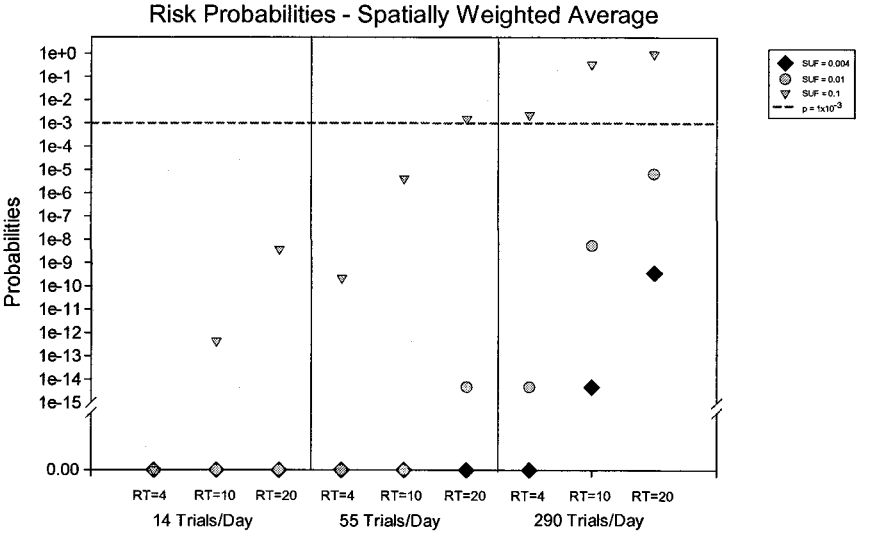
SLERA Risk Probabilities



23

BERA Risk Probabilities



24

TETRA TECH EM INC.

TRANSMITTAL/DELIVERABLE RECEIPT

Contract No. N68711-00-D-0005 Document Control No. TC . A021 . 10126

TO: Mr. Ron Fuller, Code 02R1.RF
Contracting Officer
Naval Facilities Engineering Command
Southwest Division
1230 Columbia Street, Suite 1100
San Diego, CA 92101-8517

DATE: 08/12/03
DO: 021
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