

**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

April 5, 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:**

Jim Barse	Community member
Doug Biggs	Alameda Point Collaborative (APC) Representative
Neil Coe	RAB
Anna Marie Cook	U.S. Environmental Protection Agency (EPA)
Tommie Jean Damrel	Tetra Tech EM Inc. (Tetra Tech)
Alona Davis	Sullivan International Group (Sullivan)
Doug Delong	BRAC PMO West, Environmental Compliance Manager
Susan Goss	California Environmental Protection Agency (Cal/EPA) Department of Toxic Substances Control (DTSC)
Jennifer Holder	Arcadis BBL
John Kaiser	Regional Water Quality Control Board (Water Board)
Joan Konrad	RAB
Annette Kuz	Community member
James Leach	RAB
Gretchen Lipow	Community member
Dot Lofstrom	DTSC
Patrick Lynch	Community member
John McMillan	Shaw Environmental and Infrastructure, Inc. (Shaw)
Mary Parker	BRAC PMO West Remedial Project Manager (RPM)
Peter Russell	Russell Resources/City of Alameda

Linda Sae Jang	Community member
Erich Simon	Water Board
Christy Smith	U.S. Fish and Wildlife Service (USFWS)
Dale Smith	RAB/Golden Gate Audubon Society
Jean Sweeney	RAB
Jim Sweeney	RAB
Michael John Torrey	RAB/Housing Authority of the City

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.

Ms. Sweeney provided the following comment:

- Page 5 of 10, sixth paragraph. The paragraph does not clarify the difference between the two types of screening mentioned.

Mr. Humphreys provided the following comments:

- Page 5 of 10, sixth paragraph, third sentence will be revised to "... MPPEH and radiological survey, visual and instrument screening" to address Ms. Sweeney's earlier comment.
- Page 7 of 10, second full paragraph, first line will be revised to "Mr. Lynch said that..." and the sixth line will be revised to say, "Mr. Lynch commented that..."
- Page 8 of 10, fourth paragraph, eighth sentence will be revised to "if, in the future, the contaminated material is dredged for a ferry terminal."

Mr. Humphreys commented that the March 2007 minutes were complete and that more detail was provided to RAB member comments, as was requested by Ms. D. Smith during the previous RAB meeting.

The minutes were approved as amended.

### II. Co-Chair Announcements

Mr. Humphreys distributed the list of documents and correspondence received during March 2007. The handout is included as Attachment B-1. Noteworthy items received include:

- A letter from Mr. Barse to the Alameda main library requesting that background documents be added to the Alameda Point Environmental Cleanup Document Repository.
- The draft final remedial investigation/feasibility study (RI/FS) for Site 35, issued by Bechtel. Site 35 is located in economic development parcel (EDC) 5, which is planned for transfer from the Navy to the city in the next several years once a developer is selected.
- A letter from Ms. Lofstrom dated February 27, 2007, commenting on the spring 2006 groundwater monitoring report. Ms. Lofstrom requested that analysis for 1,4-dioxane be included in future sampling.

Mr. Humphreys announced that former RAB member, Clem E. Burnap, passed away in February 2007 at 90 years of age. Mr. Burnap was an active community member and a retired naval engineer.

Mr. Macchiarella said that he announced at the last RAB meeting that the Navy's environmental team had won an award from the Chief of Naval Operations. He then distributed the Navy's package that was submitted and the award letter for the RAB members to view.

Mr. Macchiarella announced that the new lead RPM for Alameda Point is Mr. John Kowalczyk, who was unable to attend the RAB meeting. Mr. Kowalczyk has replaced Mr. Greg Lorton. Mr. Macchiarella also announced that he would not be attending the June 7, 2007, RAB meeting and that Mr. Kowalczyk would take his place for that meeting.

### **III. Sites 20 and 24 Revised Draft Remedial Investigation Report Presentation**

Ms. Parker began a presentation on the revised draft RI report for Installation Restoration (IR) Site 20 - the Oakland Inner Harbor, and IR Site 24, the pier area. The handout of the presentation is included as Attachment B-2. An outline of the presentation is shown on Slide 2. Ms. Parker identified Sites 20 and 24 on the site location map on Slide 3.

The revised draft RI report incorporates the near-shore sampling conducted in September 2006 in the northeastern corner of IR Site 24, where the shelf extends eastward beneath the roadway. The additional samples were collected based on a site visit with the regulatory agencies in July 2006; the Navy agreed with the comments by the regulators from the site visit. No additional sampling was required at Site 20, so no changes were made from the draft RI for Site 20. Site 20 data were presented to the RAB on April 6, 2006. The RI was conducted in accordance with the offshore core study work plan from May 2005. The sediment is the primary medium for both human and ecological exposures. The RI evaluated direct contact with sediment and uptake from consumption of aquatic organisms. All available sediment data were used to calculate risk. Tissue concentrations were based on data from laboratory tests as well as concentrations estimated from sediment. Slides 6 through 10 showed photographs of the field team, field equipment, and sampling.

IR Site 20 is located on the southern side of Oakland Inner Harbor, along a heavily industrialized shipping channel. Historically, stormwater and industrial wastes were discharged into the channel from Naval Air Station (NAS) Alameda. The shipping channel was dredged in 1993. The site was previously sampled in 1993-1994, 2001, and 2005. Slide 12 showed the sampling locations at IR Site 20.

The primary sources of contamination at IR Site 24 include stormwater and wastewater discharge from storm drains and activities at the piers, which were periodically dredged until 1978. The proposed future reuse for IR Site 24 includes docking large ships. Previous investigations include surface sediment sampling from 1996 through 1998, and sediment samples collected at three depths in 2005. In 2006, 12 sediment cores were collected near the shoreline and in the sediment shelf east of the quay wall and beneath the roadway between Piers 1 and 2. Slides 14 and 15 showed sampling locations for Site 24.

Ms. Parker introduced Ms. Holder to continue the data analysis portion of the presentation. Outfalls J and K are located under the roadway, and much of the sampling was designed to characterize the area around the outfalls. Box plots and bubble plots are used to evaluate the data in the RI. Data are provided in side-by-side box plots to evaluate distribution across time and depth. Bubble plots depict spatial distribution in surface sediments. Slide 17 showed an example of a side-by-side box plot from IR Site 20. The top plot showed results for surface samples for different years. The lower plot showed results for surface and subsurface samples for 2005/2006. The highest bar depicts the highest concentration detected, and the lowest bar depicts the lowest concentration. The boxes in the center of the data set represent the

concentrations detected between the 25<sup>th</sup> and 75<sup>th</sup> percentiles. Ambient data and risk-based thresholds are also shown for comparison. Data are also depicted for ambient stations where the Water Board and the San Francisco Bay Estuary Institute (SFBEI) collect reference data.

Slide 18 showed an example bubble plot of chromium concentrations. Different years of data are denoted by different colors, and the size of the bubble is proportional to the concentration. A bubble with a thick line indicates that the value exceeded the risk-based threshold. Ms. Sweeney commented that the bubble plot shows that higher concentrations were found in earlier years and that the chemicals may have washed out to sea or evaporated since then. Ms. Holder responded that the higher concentrations for earlier years are also shown in the box plot. She noted that there are different ways to interpret the data. Smaller concentrations in later years may mean that the concentration decreased or that data represent a different location. Conditions may have changed over years, possibly including the deposit of cleaner sediment, within the area of Oakland Inner Harbor shown on the map. Mr. Coe asked if the area shown is near Todd Shipyards. Mr. Macchiarella said that Todd Shipyards would be farther to the right on the map. Mr. Coe commented that the area would be contaminated because ships were sandblasted and the chemicals were washed into the bay. Mr. Macchiarella noted that the box plot for sediment data shows only a single chemical. He noted that the record of decision (ROD) for Site 28, the land part of the Todd Shipyard, is currently being prepared. Ms. D. Smith asked if the bubble plots show concentrations at a single depth or total concentrations for all soil depths. Ms. Holder replied that each point is a single depth. Mr. Humphreys asked where the dog walk park is located. Mr. Macchiarella replied that it is at Site 28.

A tiered approach was used for the ecological risk assessment (ERA) following Navy and EPA guidelines. A screening-level ecological risk assessment (SLERA) was performed to provide a conservative screen and to focus additional assessments. A baseline ecological risk assessment (BERA) was also conducted and represents a refinement of exposure and effects assessment and characterization of risk. Slide 20 showed a chart representing the problem formation for the ERA. Food web compartments were considered, and compartments were identified that were thought to be representative of exposure. Species within the compartments were then chosen for specific evaluation. Exposure pathways were direct exposure to surface sediment and indirect exposure through the food chain. Mr. Simon asked if the approach had changed since the draft version. Mr. Holder replied that it had not. Community toxicity was evaluated in acute and chronic sediment bioassays for the benthic invertebrate. Forage fish tissue concentrations were compared with literature-based effects thresholds and reference values to evaluate the fish community. The dietary doses for the surf scoter, double-crested cormorant, and least tern were estimated and compared with risk-based benchmarks and references to evaluate the avian community.

Three exposure pathways were identified for the Site 20 human health risk assessment (HHRA): consumption of shellfish, direct contact with sediment while harvesting shellfish, and consumption of fish. No complete exposure pathways were identified for Site 24 because of the limited access to the shoreline and the limited habitat for shellfish; therefore, no further human health risk evaluation was warranted.

Based on the evaluation of 2005 data at Site 20, no inorganic constituents exceeded risk-based sediment benchmarks, except mercury at one location, and all organic constituents were below risk-based sediment benchmarks. Based on the older data sets, no organic constituents exceeded risk-based sediment benchmarks except total polychlorinated biphenyls (PCBs) and DDX, the total dichloro-diphenyl-trichloroethane (DDT), dichloro-diphenyl-dichloroethane (DDD), and dichloro-diphenyl-dichloroethylene (DDE), at some locations. However, similar results were not obtained at these same locations in 2005. Slide 24 showed a table that summarized the conclusions of the risk assessment for Site 20. The HHRA concluded that there are no unacceptable risks associated with direct contact exposure to sediment or

exposure through ingestion of shellfish or fish. The ERA concluded that no unacceptable risk is posed to the benthic community, fish, or birds at Site 20.

Based on the evaluation of 2005 and 2006 data at Site 24, total polycyclic aromatic hydrocarbons (PAHs), pesticides, total PCBs, and several metals exceeded the risk-based sediment benchmarks in the sediment shelf located near the shore and under the roadway in the northeastern corner of the site. No inorganic constituent exceeded risk-based sediment benchmarks, except nickel and silver, for the open water portions of the site. Total PAHs, pesticides, and total PCBs were below risk-based sediment benchmarks, except for total PCBs at one location. The older data sets showed risk-based sediment benchmarks were exceeded for inorganic constituents and total PAHs in the northeastern corner and for alpha-chlordane and 4,4'-DDT at two locations. Total PCBs were above the risk-based sediment benchmarks at several locations in 1996 and 1998. Similar results were not obtained near these locations during the 2005 sampling.

The results of the ERA for Site 24 found that, based on 2005/2006 results, most sediment concentrations over the majority of the site were below risk-based sediment thresholds or reference values for the benthic invertebrate community. The estimated fish tissue concentrations were generally below risk-based thresholds or reference values over the majority of the site. Risks for the avian community were generally comparable to reference values over the majority of the site. Using realistic exposure parameters for birds, the risks were relatively low, and the risks associated with 2005 data were much lower. Based on these results, any limited potential for adverse impacts at Site 24 are primarily associated with the sediment shelf in the northeastern corner that extends east of the quay wall between outfalls J and K. Slide 27 showed a table that summarized the risk assessment conclusions for Site 24. The human health risk assessment (HHRA) concluded that no unacceptable risks are posed to human health at Site 24. The ERA concluded that any potential for adverse impacts to the benthic community, fish, and birds appears to be limited to the northeastern corner.

The RI for IR Site 20 concluded that risks to ecological receptors are insignificant and comparable to reference and that risks to human health are consistent with reference conditions. No further action is recommended for Site 20. The RI for IR Site 24 concluded that most concentrations over the majority of the site are lower than risk-based thresholds and reference concentrations, except in the northeastern corner and the sediment shelf east of the quay wall and under the roadway between outfalls J and K. Risks to ecological receptors are acceptable over the majority of the site, but there is an indication for the potential for adverse effects in the area of elevated sediment concentrations. Further evaluation or an FS is recommended for a small area of elevated sediment concentrations located in the sediment shelf east of the quay wall and beneath the roadway between outfalls J and K, which are between Piers 1 and 2.

Mr. Torrey commented that he recommends a long study because of the recall of pet foods for dogs and cats, noting that cats eat seafood.

Ms. Sweeney asked if the elevated levels of nickel and silver at Site 24 shown on Slide 25 are in the northeastern portion of the site. Ms. Holder replied that nickel and silver were the only metals at concentrations that exceeded benchmarks within the rest of the site, not including the northeastern corner. Ms. Sweeney asked how the elevated levels of nickel and silver will be addressed. Ms. Holder commented that the benchmarks are used to determine where there may be a concern, but are not used in calculating risk. The risk assessment evaluated all of the constituents and concluded and there was no risk. Ms. Parker noted that the risk-based benchmark value is lower than ambient value for nickel. Ms. Konrad asked the reference and ambient locations. Ms. Holder replied that many studies have been done to characterize the bay and set ambient concentrations. Ms. D. Smith commented that Alameda-specific ambient conditions are not used. Ms. Holder said that reference locations around Alameda were also used, but there are only 10 reference samples, although there is a large amount of data for the bay.

Ms. D. Smith asked about the reference locations at Alameda. Ms. Holder replied that a figure in the document shows the reference and ambient locations.

Mr. Lynch asked about the rationale for deciding not to complete a human exposure assessment at Site 24. He asked if it was because people do not eat fish from the bay or if it was a public access issue. Ms. Holder replied that the rationale behind the exposure for humans at Site 24 was related to the conclusion that there was minimal access for collecting shellfish and fishing. Mr. Lynch said that people fish there and that even when there was active industrial discharge, people would fish in the Seaplane Lagoon and complain of the solvent smell in the fish. The fish that may become contaminated at Site 24 can swim to other parts of the bay. Mr. Lynch added that he did not understand the rationale for not assessing human exposure. Mr. Humphreys commented that skate populations have increased in the bay and noted that skates feed on shellfish; catching skates may be another route for human exposure. Ms. Holder commented that the issue of fishing and human exposure at offshore areas around Alameda were evaluated and discussed with the regulatory agencies as part of development of the work plan. The potential for exposure to humans by fish ingestion was evaluated at all other offshore locations, including at Seaplane Lagoon. The only location that was not evaluated was the pier area because of access issues. Mr. Humphreys asked about the results of the evaluations. Ms. Holder replied that there was no risk at Site 20 and an FS and remedial response were developed for Seaplane Lagoon. Ms. Sweeney noted that there is no access restriction to Pier 3. Ms. Holder said that there are large ships in the area. Mr. Lynch commented that the Bay Conservation and Development Commission (BCDC) required the U.S.S. Hornet to provide public access to Pier 3, and including some type of public access will be an issue for any land use in the area. Ms. D. Smith asked if there is no risk, then why are there warning signs posted not to consume fish from the bay. Ms. Holder replied that there are fishing advisories in the bay for mercury, PCBs, and other contaminants. However, these are general concentrations in the bay, unrelated to Alameda. When potential risk to humans is evaluated for the site, the risk is compared with general risk from the bay. The risk found for people eating fish near the site was not found to be higher than the risk for people eating fish in other parts of the bay.

#### **IV. Offshore Site Inspection Report for Western Bayside and Breakwater Beach Presentation**

Ms. Parker began a presentation on the offshore site inspection (SI) report for Western Bayside and Breakwater Beach. The handout of the presentation is included as Attachment B-3. An overview of the presentation was shown on Slide 2. Ms. Parker identified Western Bayside and Breakwater Beach on the site location map on Slide 3.

The SI was conducted in accordance with the offshore core study work plan from May 2005 and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requirements. The sediment is the primary medium for both human and ecological exposures. The SI evaluated direct contact with sediment and uptake from consumption of aquatic organisms. All available sediment data were used to calculate risk. Tissue concentrations were based on data from laboratory tests as well as concentrations estimated from sediment.

The potential sources of contamination at Western Bayside include groundwater discharges contaminated by historical activities at IR Site 1 and IR Site 2 and stormwater and industrial wastes discharged from NAS Alameda. Previous investigations included surface sediment sampling between 1993 and 1996 and additional sediment sampling at three depths in 2005. Slide 6 showed a map of sampling locations at Western Bayside.

The primary sources of contamination at Breakwater Beach include surface runoff, stormwater, and wastewater discharged from storm drains, and discharges associated with the marina. Previous investigations included surface sediment sampling between 1996 and 2002. Sediment toxicity was

evaluated in 1996, 1998, and 2002 from a limited number of locations. Slide 8 showed a map of sampling locations at Breakwater Beach.

Ms. Parker announced that Ms. Holder would continue with the presentation. Box plots and bubble plots were used to evaluate the data in the SI. Data are provided in side-by-side box plots to evaluate distribution across time and depth. Bubble plots depict spatial distribution in surface sediments.

Slide 10 showed an example of a side-by-side box plot of total PCBs from Western Bayside. The top plot showed surface samples for different years. The lower plot showed samples at three different depths in 2005. The highest bar depicts the highest concentration detected, and the lowest bar depicts the lowest concentration. The boxes in the center of the data set represent the concentrations detected between the 25<sup>th</sup> and 75<sup>th</sup> percentiles. Background values are also shown for comparison. The 2005 data in the top plot is the same data shown for the 0- to 5-centimeter (cm) depth in the lower plot. Mr. Humphreys asked about the meaning of the “ER-M” shown in the legend of the box plot. Ms. Parker replied that ER-M is an ecological screening level used for the risk assessment.

Slide 11 showed an example bubble plot of 4,4'-DDx concentrations from Western Bayside. Mr. Torrey asked if the red circles show high concentrations. Ms. Holder replied that red circles illustrate the 1993 and 1994 data. Mr. Humphreys asked if data were included for lead from the Skeet Range. Ms. Holder said that the lead shot data from the Skeet Range were not included in this evaluation because they were evaluated in the Skeet Range investigations. These data included data collected in the area of the Skeet Range, evaluating the various compounds in sediment, but not including lead shot data. Mr. Humphreys asked if lead was included in the analysis. Ms. Holder replied that samples were analyzed for lead, but concentrations were similar to background concentrations in the bay. Mr. Humphreys commented that wave action might have carried some of the lead shot up the shoreline. Ms. Sweeney asked why no data for 2001 are shown on the bubble plot. Ms. Holder said that the data for 2001 may have not been relevant for this plot.

The following three chemical exposure pathways were identified for the HHRA: consumption of shellfish, direct contact with sediment while harvesting shellfish, and consumption of fish. The HHRA is based on standard exposure equations, and both the central tendency exposure and the reasonable maximum exposure for humans were evaluated. Fish and shellfish ingestion rates were based on data published by the SFBEI for the San Francisco Bay area.

A tiered approach was used following Navy and EPA guidelines for the ERA. A SLERA was performed to provide a conservative screen and to focus additional assessment activities. A BERA was also conducted and represents a refinement of exposure and effects assessment and characterization of risk. Slide 15 showed a chart representing the problem formation for the ERA. Food web compartments were considered, and compartments were identified that were thought to represent exposure. Species within the compartments were then chosen for specific evaluation. Exposure pathways were direct exposure to surface sediment and indirect exposure through the food chain. Toxicity for the benthic invertebrate community was evaluated in acute and chronic sediment bioassays. Forage fish tissue concentrations were compared with literature-based effects thresholds and reference values to evaluate the fish community. The dietary doses for the surf scoter, double-crested cormorant, and least tern were estimated and compared with risk-based benchmarks and references to evaluate the avian community.

Based on the evaluation of 2005 data, no organic constituent exceeded risk-based sediment benchmarks in surface sediment except for nickel, which was below background. All organic constituents were below risk-based sediment benchmarks in surface sediment. Based on the evaluation of older data sets, the inorganic constituents antimony, mercury, and nickel exceeded risk-based sediment benchmarks in surface sediment collected in 1993 and 1994 but not 1996. Mercury exceeded background at only one

1993 and 1994 location. No organic constituents exceeded risk-based sediment benchmarks except total PCBs and 4,4'-DDT, at only one location each.

Results of the HHRA for the direct contact exposure pathway indicate noncancer hazard quotients (HQs) were all below 1, cancer risks were either below  $10^{-6}$  or less than the reference risks, and cumulative site risk was less than reference risk. HQs were all below 1, cancer risks were either below  $10^{-6}$  or similar to the reference risks, and cumulative site risk was less than reference risk for the shellfish ingestion and consumption of fish exposure pathways.

Results of the ERA for the benthic invertebrate community were that the limited toxicity observed in 1993 and 1994 bioassays was not supported by sediment concentrations. None of the estimated fish tissue concentrations exceeded the risk-based thresholds. No concentrations exceeded risk-based thresholds in the 2005 data set for the avian community. No concentrations exceeded risk-based thresholds when realistic foraging ranges were used for historical data. No significant risk to ecological receptors was identified. Slide 20 showed the summary of the risk assessment conclusions for Western Bayside. No unacceptable risks were associated with direct contact exposure, shellfish ingestion, or fish ingestion. No unacceptable risks were posed to benthic, fish, and avian communities. Mr. Humphreys asked what the term "or comparable to reference conditions" means. Ms. Holder replied that she could not remember the exact value that was used for the reference conditions. Ms. Parker commented that, in general, ambient or background values are used for reference conditions. Mr. Humphreys asked what risk was associated with the reference conditions. Ms. Parker said she was not sure of specific values. Ms. Holder said she would have to review the report.

Based on the evaluation of older data sets at Breakwater Beach, no inorganic constituents exceeded risk-based sediment benchmarks in surface sediment except for nickel, which was below background. No organic constituents exceeded risk-based sediment benchmarks. The results of the Breakwater Beach HHRA indicate that the noncancer HQs were all below 1, cancer risks were either below  $10^{-6}$  or less than the reference risks, and cumulative site risk was less than reference risk for the direct contact exposure pathway. HQs were all below 1, cancer risks were either below  $10^{-6}$  or similar to the reference risks, and cumulative site risk was less than reference risk for the shellfish ingestion and consumption of fish exposure pathways.

Mr. Humphreys commented that in some cases the wording used is "comparable to reference risk" and at other times "similar to reference risk" is used. He asked if these terms mean the value is greater than the reference risk, since for some cases the wording used is "less than reference risk." Mr. Macchiarella commented that he could provide an answer later to Mr. Humphreys regarding these exact values from the report.

The results of the Breakwater Beach ERA for the benthic invertebrate community was that there is evidence to suggest that the toxicity observed in 1998 was not associated with site conditions, and toxicity was not replicated in 2002 bioassays. Based on historical results, most sediment concentrations were below risk-based thresholds, and all were below reference. None of the estimated fish tissue concentrations exceeded the risk-based thresholds. No concentrations exceeded the highest risk-based thresholds, risks were generally comparable to reference, and risks were relatively low when using realistic exposure parameters for the avian community. No significant risk to ecological receptors was identified. Slide 24 showed the summary of the risk assessment conclusions for Breakwater Beach. No unacceptable risks were associated with direct contact exposure, shellfish ingestion, or fish ingestion. No unacceptable risks were posed to benthic, fish, and avian communities.

The SI concluded that sediment investigations indicate that most sediment contaminant concentrations at both Western Bayside and Breakwater Beach are lower than risk-based thresholds or reference

concentrations. Risks to human health are acceptable and consistent with reference conditions at both sites, and risks to ecological receptors are acceptable and comparable to reference at both sites. No further action is recommended for both Western Bayside and Breakwater Beach.

Mr. Torrey asked if it was concluded that there is no risk to cats and dogs because there is no risk to fish and birds. Ms. Holder replied that the conclusion cannot be reached because risk to cats and dogs was not evaluated. Mr. Torrey said pet foods have been recalled and that because cats eat seafood the risk for cats and dogs should be evaluated.

Ms. Sweeney asked if there are toxic constituents in the debris that collects at the eastern edge of the Breakwater Beach site. Ms. Holder replied that the Navy's sampling and risk assessment show that the sediment is not toxic, and the debris should not be toxic. Ms. D. Smith asked if the investigation primarily considered surface sediments. Ms. Holder replied that the risk assessments primarily focused on surface sediments because that layer of sediment is most in contact with the species evaluated. Cores were also collected to make sure no possible contamination was overlooked.

Ms. Goss asked about the evaluation of radionuclides at Western Bayside. Ms. Parker said that Western Bayside was the only site where there was a potential for radionuclide contamination. The data were collected, and the risk assessment includes details and the criteria for evaluating risk, which is also discussed in the work plan. The risk was below  $1 \times 10^{-6}$ .

## **V. BCT Activities**

Ms. Cook began a discussion on the March 2007 BRAC Cleanup Team (BCT) activities. She provided a handout, which is included as Attachment B-4. There was a conference call on March 6, 2007, to discuss the draft OU-5 ROD for groundwater beneath the Coast Guard Housing and Alameda Annex. The regulatory agencies have reviewed the draft ROD that was issued at the end of 2006 and submitted comments to the Navy. One major technical concern was that the regulators concluded that the Navy needs to provide more clarity and sufficient explanations for the unusual stratification seen in the plume of benzene and naphthalene in groundwater. The concentrations are low from about 6 feet below ground surface (bgs) to 12 feet bgs. At about 12 feet bgs, the concentrations become more apparent and increase with depth to a maximum concentration at between 16 and 20 feet bgs. More explanation should be provided on how this stratification is addressed by the remedy selection and the remedial design.

Many of the agency comments on the OU-5 ROD speak to the need for greater clarity on the objectives of the institutional controls (ICs) and the means they will be implemented. The ICs for the ROD are complicated because of the differing uses on the property overlying the plume. There is property owned by the Navy and leased to the Coast Guard, property that has been privately developed into the Bayport housing area, and potentially the property of the College of Alameda. The BCT and its legal advisors are working to resolve the issue. The ICs will be in place only for the duration of the remedy, which is estimated to be 8 years, so they are not long-term ICs. Mr. Torrey asked if the plume could be under Esperanza Village. Ms. Cook said it would not have reached that area and does not cover the whole of the Bayport housing area. Mr. Humphreys asked if the issue was only groundwater, or if soil was included. Ms. Cook replied that groundwater is the issue for this OU-5 ROD. Soil is covered under a different ROD. Ms. Sweeney asked if the plume at Kollman Circle and partially under the school is shallow compared with the plume at Alameda Annex Site IR02. Ms. Cook replied that, in general, the groundwater contamination has followed the same trend, regardless of location. The concentrations in the groundwater always increase with depth. There is enough aerobic activity occurring that it is naturally remediating the benzene and naphthalene contamination in the shallow areas of the groundwater. There is no oxygen (anaerobic conditions) at the lower depths, which is why biosparging was the chosen remedy. Biosparging is also a passive remedy such that it does not cause off-gassing into the residential area.

Mr. Torrey asked if the plume is moving under the College of Alameda and under the Ruby Bridges School. Ms. Cook said the plume has reached the outskirts of the College of Alameda, near the playing field. The Navy has developed a sampling plan. Mr. Lynch commented that the sampling should have occurred earlier in the process. Ms. Cook said she agreed that ideally all information should be obtained before the ROD is developed. Instead of delaying the project and the ROD, and since the technology used for the remedy will not change, the footprint of the remedial plan will be expanded as the plume is further delineated. The goal is to get the chosen remedy system in place to start remediating the groundwater as soon as possible. Mr. Lynch commented that in the meantime a public school is being built and there is no information available about the contamination that may be in groundwater. Ms. Parker asked which school was intended. Mr. Lynch replied that he was describing the Ruby Bridges School. Mr. Humphreys asked if samples had been collected at the occupied schools. Ms. Cook replied that there have been rounds of soil gas sampling under the schools and no contaminants have been detected. There has been no evidence of off-gassing from this plume. The main risk from the groundwater is use for showering or drinking. All water at Alameda is supplied by the East Bay Municipal Utilities District (EBMUD). The groundwater is not used. Ms. Lipow, a community member, commented that she works in the school and that the water has been tested there and found to be acceptable for drinking. However, some sinks work and some do not. She asked if the water is safe to drink. Ms. Cook replied that the water being supplied to the whole of Alameda comes from EBMUD. It is cleaned and treated water and is safe to drink from all faucets from a sink in a house or school. Mr. Torrey asked how that water is separated from the groundwater. Ms. Cook replied that the groundwater is in the ground and the EBMUD water is carried in pipes at high pressure, so that there is no risk of contamination from the groundwater. Mr. Leach commented that the EBMUD water comes from the Mokelumne River.

Ms. Konrad asked if the Navy will clean up the plume under the College of Alameda. Ms. Cook said it will be remediated if the plume is under the college. Ms. Sweeney said that it appears that the plume boundary extends into the property of the college. Mr. Macchiarella said that the Navy will confirm whether the plume extends onto College of Alameda property and, if so, will include it in the remedy. Ms. Sweeney commented that the college did not used to allow sampling on its property. Mr. Macchiarella said that the Navy is currently developing an access agreement with the college.

Three items were discussed at the monthly BCT meeting: public benefit conveyance parcel 1(PBC-1) finding for suitability to transfer (FOST), the basewide groundwater monitoring program, and the site management plan (SMP) for fiscal year 2008.

1. The PBC-1 FOST is being prepared. PBC-1 is the area to the northeast of the Site 26 western hangar zone. Petroleum contamination has been found in this area and has been remediated under the oversight of the Water Board. There are no CERCLA issues in this area. The document will be sent for public review and comments in 1 or 2 months.
2. The BCT discussed which groups of monitoring wells could be removed from the basewide groundwater monitoring program and moved to the remedial action program as part of operation and maintenance. Monitoring wells in sites where a ROD has been signed and are beginning to implement the remedies will be the first to be removed from the basewide program. She noted that removing wells from the basewide program is a sign that progress is being made with the program and it is a positive step. Ms. Sweeney asked if fewer large documents will be issued. Ms. Cook replied the documents may be thinner.
3. The annual update for the SMP will be under way soon, with a draft ready by June. The draft will be provided to the RAB as well as the regulators for review.

Ms. Lofstrom commented that the Navy has agreed to sample for 1,4-dioxane during current data gap sampling that is being performed, but not in the context of the basewide groundwater monitoring program.

Mr. Lynch commented that data he reviewed showed that the extent of the plume in that area was not completely delineated. Mr. Torrey commented that the plume extends to the College of Alameda, but that the Ruby Bridges School lies before the college. Mr. Macchiarella said that it is possible that the plume has extended east to the College of Alameda property, but the data suggest it has not migrated south far enough to the new school area. A few data points will be filled in on the southwest side of the plume. Mr. Torrey asked if the Navy believes the plume has moved up under the breakers to Bayport into the athletic field. Mr. Macchiarella said he doesn't understand that area described, but that he would be happy to review the maps with Mr. Torrey. Mr. Torrey commented that there is a problem because families live in that area. Mr. Macchiarella said that the risk assessment has shown that there is no concern with groundwater present under homes or the school. The potential concern is the groundwater being used as a source of drinking water. The Navy has chosen cleanup goals for the site that are consistent with the levels that would allow for it to be used as drinking water. Mr. Torrey reiterated that there are families in the area across from the athletic field.

## **VI. Community and RAB Comment Period**

Mr. Leach announced that he would not be able to attend the May 2007 RAB meeting.

Mr. Torrey commented that he was not able to contact Mr. Macchiarella by telephone because Mr. Macchiarella's phone system does not accept calls from rotary phones. He said he was unable to leave a voice message for Mr. Macchiarella. Mr. Macchiarella said he would investigate the issue but then suggested that Mr. Torrey leave messages with his secretary, Ms. Betty Foster, at 619-532-0914.

Mr. Lynch commented that there was an article in the *Alameda Journal* about development at Alameda Point. There was a suggestion in a consultant's report that the cost of cleanup or amount of cleanup required would be reduced if multi-unit housing were built. He said that he hopes this statement is not based on the concept that there are two different residential cleanup standards — one for single-family homes, and one for apartment buildings. He said he was concerned that a cleanup plan would promote that concept. Mr. Macchiarella asked which consultant had suggested this alternative. Mr. Lynch said he was uncertain. Ms. Sweeney commented that it may have been Andrew Thomas, who has said that toxic areas could be built over if the area was paved first and the housing was built on top of the paved area. Mr. Humphreys said that he thought the suggestion was that the first floor would be parking or businesses, so that there would be an air space between the housing and the ground surface.

Ms. Lipow asked about the volatility of constituents in the groundwater plumes and if there is possibility of an explosion. Mr. Macchiarella said that issues of concern are with volatilization of chemicals from the groundwater through the soil and into buildings. That pathway is primary for risk because the groundwater is not used for consumption or showering. Ms. Sweeney commented that many people use water from wells for washing cars and watering lawns and that children play in it. Mr. Macchiarella noted that the water is not used for drinking. Ms. Sweeney countered that it might be used for drinking. Mr. Macchiarella said that cleanup goals allow for a person to drink the water for the majority of their life. It is unlikely that there would be unacceptable risk from wells in that part of Alameda for occasional contact through sprinklers and washing cars. Ms. Cook added that the solvents in the groundwater are volatile in that they are able to pass through soil, but they are not explosive. Mr. Humphreys said that the concentrations seen are far below the lower explosive limit. Ms. Cook said that the highest concentrations sink to the lower part of the aquifer. Ms. Lipow asked if the chemicals emit a gas that

could come into the air in the school yard. Ms. Cook said that high concentrations in the groundwater could emit off low concentrations of the chemical in the air. The high concentrations are not found in the shallow areas of the aquifer. If concentrations were found to be a risk to schools or homes, immediate action would be taken. However, the reason for the cleanup of groundwater is for the unlikely event that the groundwater would become a source of drinking water in the future. The groundwater qualifies under a broad definition of a potential source of drinking water. To be conservative, the water will be cleaned up to drinking water standards, so that there is no concern in the future. Ms. Sweeney asked if benzene is a solvent. Ms. Cook replied that benzene has been used as a solvent, but may have been used for some other purpose in this case. Ms. Sweeney noted that solvents were removed at Building 5 and asked if it was benzene. Ms. Cook said those were heavier, chlorinated solvents.

Mr. Barse asked the Navy about the status of the implementation of the remedy following the ROD for Site 17, Seaplane Lagoon. Mr. Macchiarella said that the ROD was signed and the next step is to prepare a remedial design (RD) and a remedial action/workplan (RA/WP). Ms. Parker said that the RD has been awarded to a contractor and that the RA/WP will be awarded next. The document will then be generated and issued to the RAB for review. Ms. Sweeney asked about the schedule for remediation. Mr. Macchiarella said he was not sure how long it would take but much work is associated with the actual removal of the sediments. Before that point, the removal action for the storm drain issue must be completed. Actual field work for implementation of the sediment remedy will probably take longer than one would guess due to the associated work elements, such as: screening, dewatering, characterization, and disposal.

Mr. Humphreys asked if there is any possibility because of budgeting issues and the war that the Department of Defense may take money away from the environmental remediation programs. He asked if the Navy has any contingency plans for that possibility. Mr. Macchiarella said that it has not happened in the past. The Navy typically attempts to limit potential funding reductions by awarding its contracts as early as possible in the fiscal year. Half of the budget has been used this year already. It would be difficult to de-obligate new projects. The program as a whole is not at risk, he said, only the part of the program that has not yet been awarded.

Ms. Cook added that the statutory deadline requires that the remedial work must start within 15 months after the ROD is signed. This requirement limits the amount of time that can be spent on the design and is a compelling reason for funding the remedial work. Remediation startup cannot be delayed beyond 15 months.

Mr. Barse asked about if the preliminary step to address the storm drain issue is part of the work plan, and if that work plan is being developed or if it is already final. Mr. Macchiarella said that the work plan is being developed for the stormwater drain removal and the regulatory agencies are reviewing it now. Mr. Barse asked if another work plan is related to Site 17. Ms. Parker said that a remedial work plan for the offshore work is currently being developed and will be sent to the agencies for review.

Mr. Macchiarella commented on the subject of the Todd Shipyard that was brought up earlier in the meeting. He noted that the area of the Navy's property that the Navy calls the Todd Shipyard is a portion of the historical extent of the actual Todd Shipyard operations.

The meeting adjourned at 8:30 p.m.

**ATTACHMENT A**

**NAVAL AIR STATION ALAMEDA  
RESTORATION ADVISORY BOARD MEETING AGENDA**

**April 5, 2007**

**(One Page)**

# ***RESTORATION ADVISORY BOARD***

***NAVAL AIR STATION, ALAMEDA***

## ***AGENDA***

**APRIL 5, 2007, 6:30 PM**

**ALAMEDA POINT – BUILDING 1 – SUITE 140**

**COMMUNITY CONFERENCE ROOM**

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

<b><u>TIME</u></b>	<b><u>SUBJECT</u></b>	<b><u>PRESENTER</u></b>
<b>6:30 - 6:45</b>	<b>Approval of Minutes</b>	<b>Mr. George Humphreys</b>
<b>6:45 - 7:00</b>	<b>Co-Chair Announcements</b>	<b>Co-Chairs</b>
<b>7:00 – 7:30</b>	<b>Presentation on the Site 20/24 Revised Draft Remedial Investigation Report</b>	<b>Ms. Mary Parker &amp; Ms. Jennifer Holder</b>
<b>7:30 – 7:50</b>	<b>Presentation on the Offshore Site Inspection Report for Western Bayside &amp; Breakwater Beach</b>	<b>Ms. Mary Parker &amp; Ms. Jennifer Holder</b>
<b>7:50 – 8:00</b>	<b>BCT Activities</b>	<b>Ms. Anna-Marie Cook</b>
<b>8:10 – 8:30</b>	<b>Community &amp; RAB Comment Period</b>	<b>Community &amp; RAB</b>
<b>8:30</b>	<b>RAB Meeting Adjournment</b>	

**ATTACHMENT B**

**NAVAL AIR STATION ALAMEDA  
RESTORATION ADVISORY BOARD MEETING HANDOUT MATERIALS**

- B-1 List of Reports and Correspondence Received during March 2007, George Humphreys, RAB Community Co-Chair (1 page)
- B-2 Presentation on the Sites 20 and 24 Revised Draft Remedial Investigation Report, presented by Mary Parker, BRAC PMO West, and Jennifer Holder, Arcadis BBL (15 pages)
- B-3 Presentation on the Offshore Site Investigation Report for Western Bayside and Breakwater Beach, presented by Mary Parker, BRAC PMO West, and Jennifer Holder, Arcadis BBL (13 pages)
- B-4 March 2007 BCT Activities, Anna-Marie Cook, EPA (1 page)

**ATTACHMENT B-1**

**LIST OF REPORTS AND CORRESPONDENCE RECEIVED MARCH 2007**

**(One Page)**

Restoration Advisory Board  
Documents and Correspondence  
Received during March 2007

Documents

1. March 2, 2007, "Final Time-Critical Removal Action Work Plan for Installation Restoration Sites 1, 2, and 32, Alameda Point, California", CD and replacement pages, prepared by Tetra Tech EC, Inc. for BRAC Program Management Office West.
2. March 8, 2007, "Site Inspection Report Western Bayside and Breakwater Beach, Alameda Point, California", prepared by Battelle; Blasland, Bouch and Lee, Inc.; and Neptune & Company for BRAC Program Management Office West.
3. March 8, 2007, "Draft Final Remedial Investigation for Site 32, Alameda Point, Alameda, California", prepared by Bechtel Environmental, Inc., for BRAC Program Management Office West.
4. March 13, 2007, "Draft Final Remedial Investigation/Feasibility Study for Site 35, Alameda Point, Alameda, California", five volumes, prepared by Bechtel Environmental, Inc., for BRAC Program Management Office West.
5. March 29, 2007, "Fall 2006 Alameda Basewide Quarterly Groundwater Monitoring Report, Alameda Point, Alameda, CA: March 2007", prepared by Innovative Technical Solutions, Inc. for BRAC Program Management Office West.

Correspondence

1. March 7, 2007, "RE: Draft Revision : Soil Remedial Investigation Report for IR Site 31 Marina Village Housing, Alameda Point", letter from Ms. Anna-Marie Cook, U. S. EPA, Region IX, to Mr. Thomas Macchiarella, BRAC Program Management Office West.
2. Feb. 27, 2007 (received March 15, 2007), "Review of Draft Final Spring 2006 Basewide Annual Groundwater Monitoring Report, Alameda Point, Alameda", from Ms. Dot Lofstrom, P. G., Department of Toxic Substances Control to Mr. Thomas L. Macchiarella, BRAC Program Management Office West.
3. March 10, 2007, "RE: Request for addition of baseline-background materials to the Alameda Point Environmental Clean-up Document Repository Collection at the Main Library", letter from Mr. Jim Barse to Head Reference Librarian, City of Alameda Main Library.
4. March 20, 2007, "RE: Draft Work Plan for Data Gap Sampling Investigation, Installation Restoration Site 14, Alameda Point", from Ms. Anna-Marie Cook, U. S. EPA Region IX, to Mr. Thomas Macchiarella, BRAC Program Management Office West.

**ATTACHMENT B-2**  
**SITES 20 AND 24 REVISED DRAFT RI REPORT**  
**(15 Pages)**



**BRAC  
PMO**

**DRAFT REMEDIAL INVESTIGATION REPORT  
REVISION 1 FOR  
IR SITE 20 (OAKLAND INNER HARBOR)  
AND IR SITE 24 (PIER AREA)  
ALAMEDA POINT,  
ALAMEDA, CALIFORNIA**

**RAB Meeting  
April 5, 2007**

Mary Parker  
Navy Project Manager

Jennifer Holder  
Arcadis BBL



**LIST OF TOPICS/AGENDA**

**BRAC  
PMO**

- **Site Location**
- **Remedial Investigation Overview**
- **Remedial Investigation Approach**
- **Site History and Sample Locations**
- **Summary of Nature and Extent**
- **Ecological Risk Assessment**
- **Human Health Risk Assessment**
- **Conclusions of the Remedial Investigation (RI) Report**





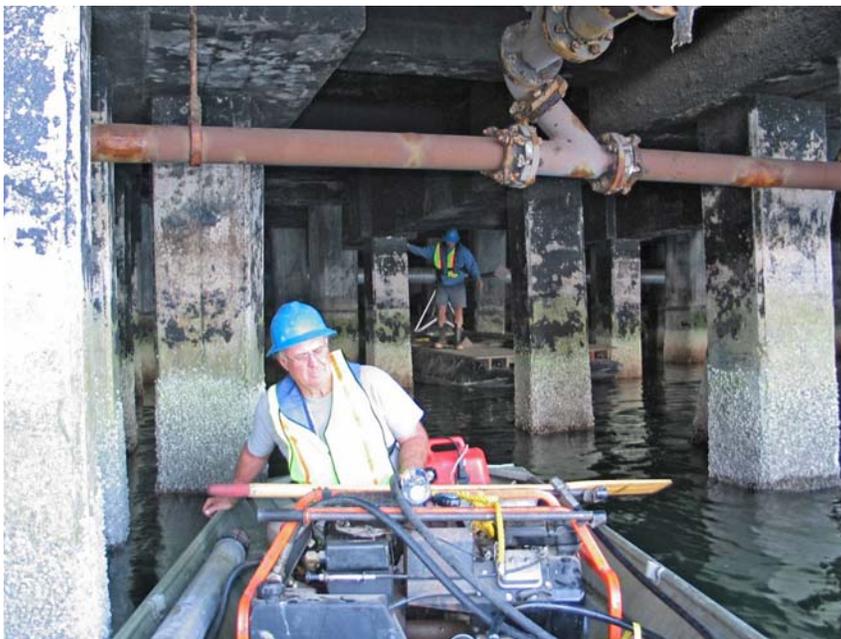
## REMEDIAL INVESTIGATION APPROACH

**BRAC  
PMO**

- The RI was conducted in accordance with the Offshore Core Study Workplan (May 2005)
- Sediment is the primary medium for both human and ecological exposures
  - Evaluated direct contact to sediment and uptake from consumption of aquatic organisms
- Used all available sediment data to calculate risks
  - All Years
  - 2005/2006 Surface (0-5 cm)
  - 2005/2006 Subsurface (5-25 cm)
- Tissue concentrations based on data from laboratory tests as well as concentrations estimated from sediment



**BRAC  
PMO**



Support vessel for sampling under the roadway at IR Site 24 (sampling platform in background)



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Sampling platform supported by pontoons on either side. Hole in the middle of the platform to conduct core and grab sampling under the roadway at IR Site 24.

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A 10 cm diameter aluminum core tube lined with polyethylene (~4 mil) for the core samples.

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A 0.1 m<sup>2</sup>  
stainless steel  
modified van  
Veen for  
surface  
samples with  
sampling  
bowl and  
spoon.

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The *Shearwater* was  
used for the majority of  
the offshore work.

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## IR SITE 20 HISTORY

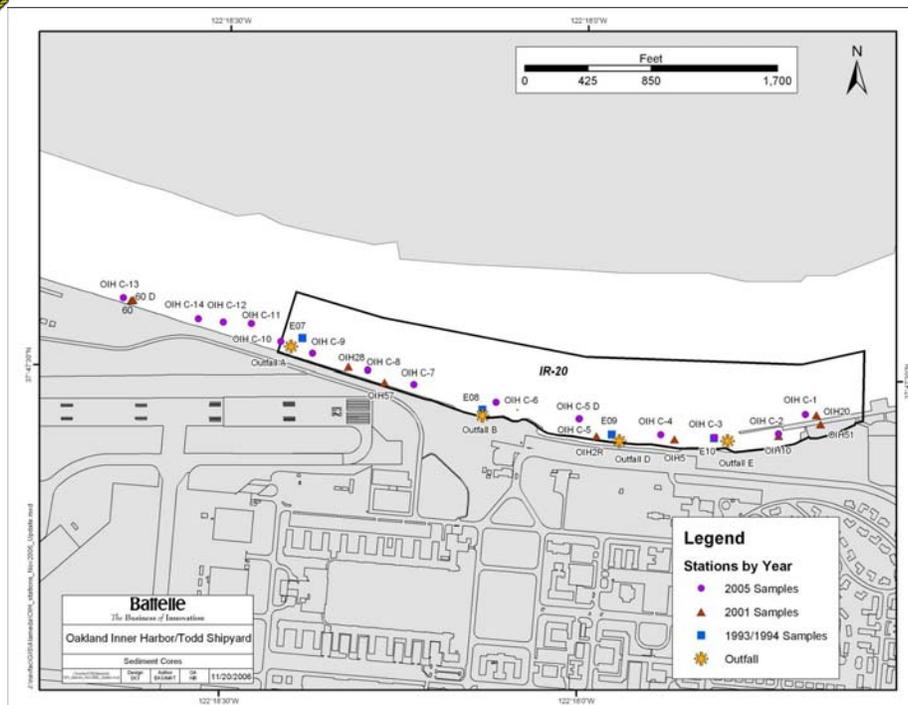
**BRAC  
PMO**

- IR Site 20 is located on the southern side of Oakland Inner Harbor, along a heavily industrialized shipping channel
  - Stormwater and industrial wastes discharged from NAS Alameda
  - The shipping channel was dredged to 12 m in 1993
- This site was sampled in 1993/1994, 2001, 2005



## SAMPLING LOCATIONS AT IR SITE 20

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# IR SITE 24 HISTORY

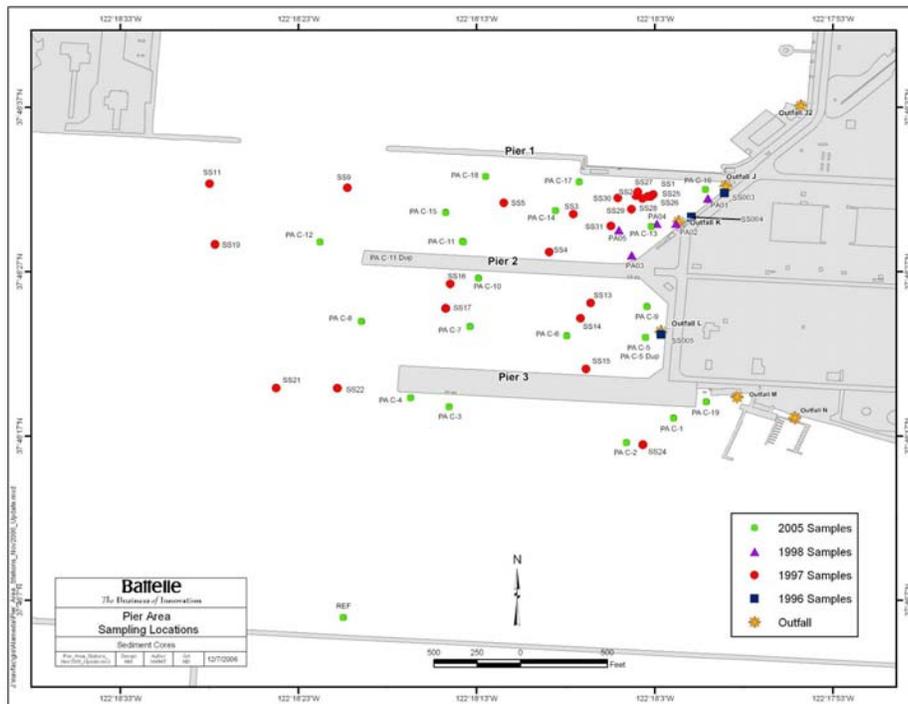
**BRAC  
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- Primary sources include stormwater and wastewater discharged from storm drains, as well as activities at the piers
- The piers were periodically dredged until 1978
- The proposed future reuse includes docking large scale ships such as ferries, cruise ships, or historical landmark vessels
- Summary of Investigations:
  - A total of 27 surface sediment samples collected from 1996 through 1998
    - In 1998, the toxicity and uptake of contaminants was evaluated in laboratory tests using sediments from 5 locations near the sewer outfalls
  - In 2005, 19 additional sediment locations were evaluated
    - 3 depths (0-5 cm, 5-25 cm, 25-50 cm)
  - In 2006, 12 additional sediment cores were collected near the shoreline and in the sediment shelf east of the quay wall and beneath the roadway between Piers 1 and 2.



# LOCATION OF IR SITE 24 SAMPLES (1996, 1997, 1998, 2005)

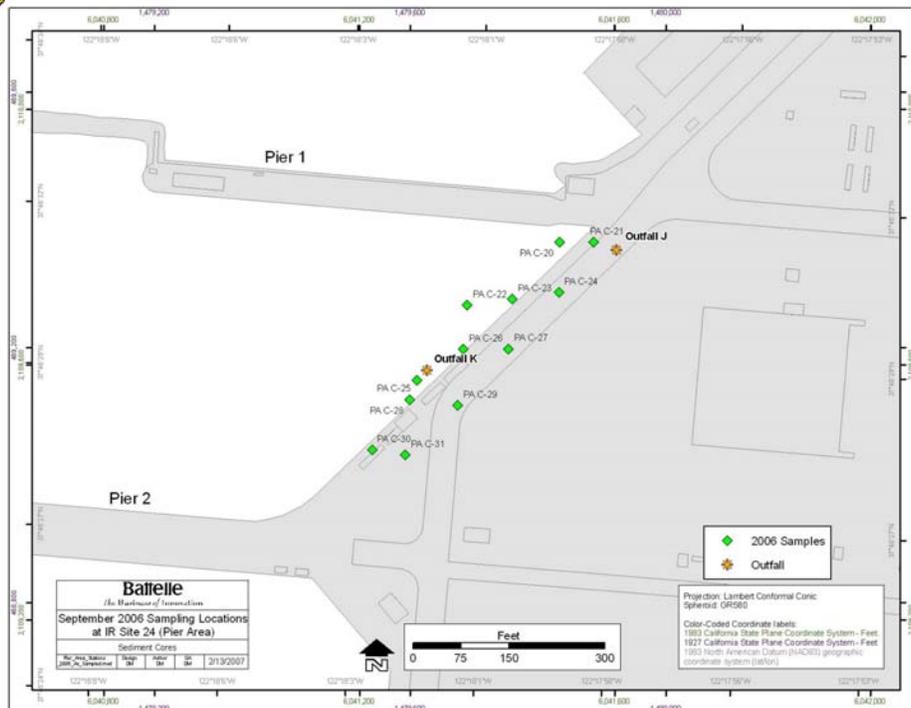
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PMO**





## LOCATION OF IR SITE 24 SAMPLES (2006)

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## SUMMARY OF NATURE AND EXTENT

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- Data are presented in side-by-side box plots to evaluate distribution across time and depth
  - Surface samples across years
  - 2005/2006 surface and subsurface
  - Values for risk-based thresholds and ambient concentrations presented for comparison
- Bubble plots depict spatial distribution in surface sediments
  - Each year denoted by different colors
  - Bubble size proportional to concentration
  - Thick lines indicate value exceeds risk-based thresholds

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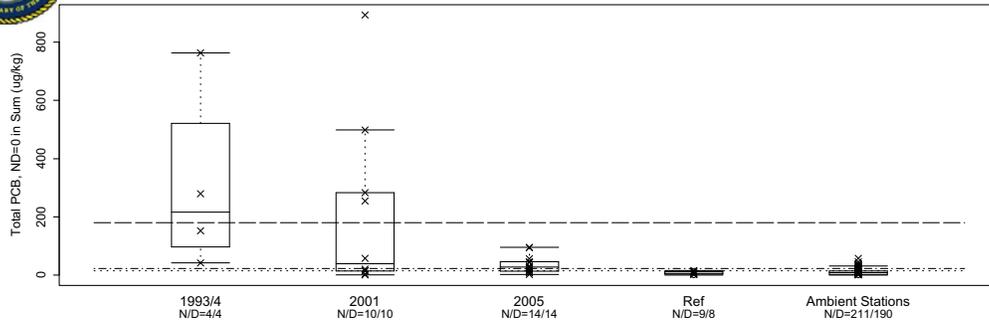
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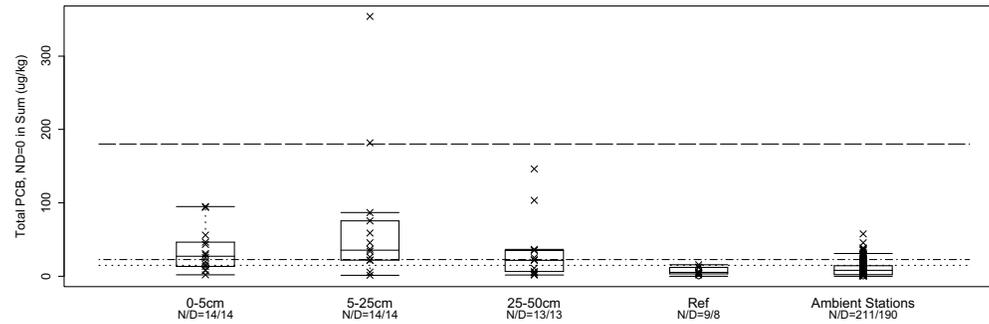
## EXAMPLE SIDE-BY-SIDE BOX PLOT (from IR Site 20)

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x = Detected concentration ( $\geq 1$  detect in sum)  
o = Non-detect (all non-detects in sum)  
N/D = number of samples/number detected

..... = Ambient Value (100% fines)  
- - - - = Eco Screening Value  
- - - - = ER-M



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## EXAMPLE BUBBLE PLOT

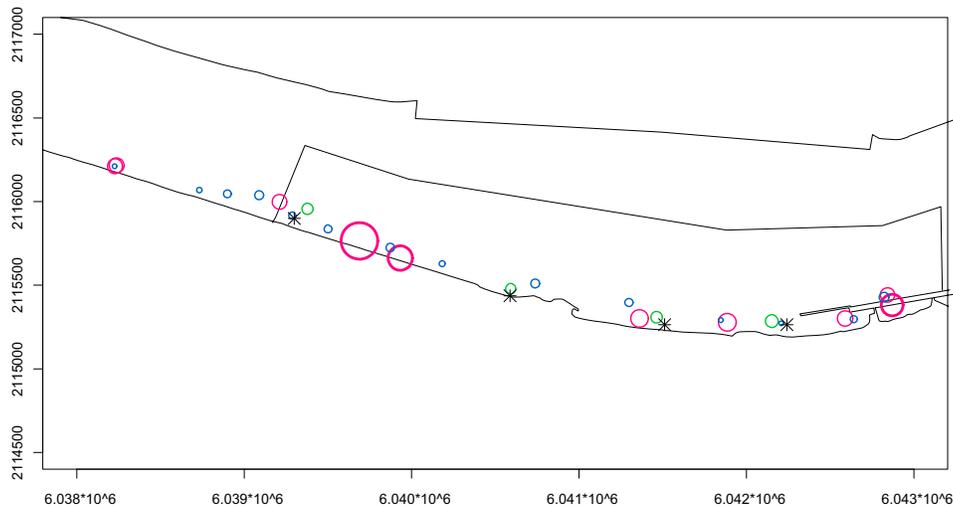
**BRAC  
PMO**

Alameda OIH-Todd  
CHROMIUM

● 1993/4 Data  
● 2001 Data  
● 2005 Data

○ 1230 MG/KG maximum  
○ 178.1 MG/KG mean  
○ 92.6 MG/KG median  
○ 20.5 MG/KG minimum

○ 370 MG/KG ERM  
○ 81 MG/KG Eco Screen Value  
\* Outfall Location  
concentration proportional to area of circle



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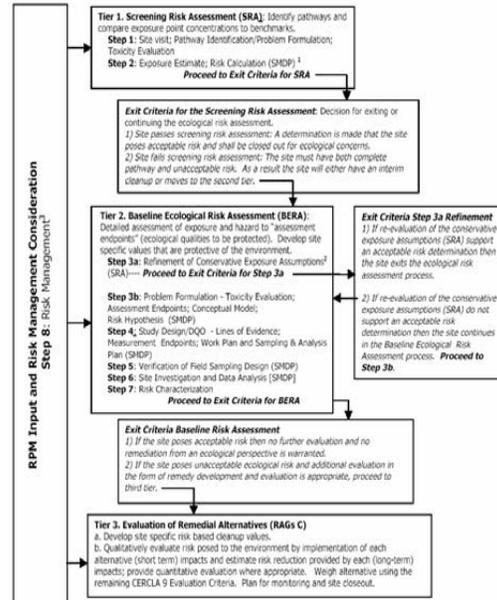


# ECOLOGICAL RISK ASSESSMENT

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• Tiered Approach following Navy and EPA Guidance:

- Screening-level ecological risk assessment (SLERA) to provide a conservative screen and focus additional assessment activities
- Baseline ecological risk assessment (BERA) representing a refinement of exposure and effects assessment and characterization of risk

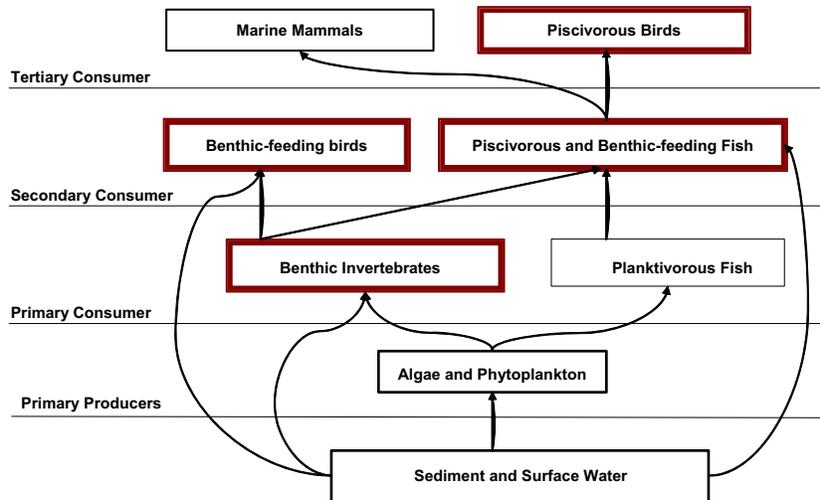


(from CNO, 1999)  
 Note: 1) See EPA's Step ERA Process for requirements for each Scientific Management Decision Point (SMDF).  
 2) Refinement includes but is not limited to background, bioavailability, detection frequency, etc.  
 3) Risk Management is incorporated throughout the tiered approach.



# ECOLOGICAL RISK ASSESSMENT PROBLEM FORMULATION

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- Similar Ecological Exposure Pathways were identified at both sites
  - Direct exposure with surface sediments
  - Indirect exposure through the food-chain



## **ECOLOGICAL RISK ASSESSMENT ASSESSMENT & MEASUREMENT ENDPOINTS**

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- **Benthic Invertebrate Community**
  - Toxicity in acute and chronic sediment bioassays
- **Fish Community**
  - Forage fish tissue concentrations compared to literature-based effects thresholds and reference
- **Avian Community**
  - Estimated dietary doses in birds compared to risk-based benchmarks and reference
    - Surf scoter
    - Double-crested cormorant
    - Least tern



## **HUMAN HEALTH RISK ASSESSMENT CONCEPTUAL SITE MODEL**

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PMO**

- **IR Site 20**
  - Three exposure pathways identified
    - Consumption of shellfish
    - Direct contact with sediment while harvesting shellfish
    - Consumption of fish
- **IR Site 24**
  - Because of the limited access to the shoreline and limited habitat for shellfish, no complete exposure pathways were identified so no further human health risk evaluation was warranted



## SUMMARY OF SURFACE SEDIMENT CHEMISTRY FOR IR SITE 20

**BRAC  
PMO**

- Based on evaluation of the 2005 data:
  - No inorganic constituent exceeded risk-based sediment benchmarks, except mercury at one location
  - All organic constituents (including PAHs, PCBs, and pesticides) were below risk-based sediment benchmarks
- Based on the older data sets:
  - No organic constituents exceeded risk-based sediment benchmarks except Total PCBs and DDX at some locations; however, similar results were not obtained near these locations in 2005



## SUMMARY OF RISK ASSESSMENT CONCLUSIONS FOR IR SITE 20

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Assessment Endpoint	Summary of Risk Characterization	Conclusions
<b>HUMAN HEALTH RISK ASSESSMENT</b>		
Direct Contact	<ul style="list-style-type: none"> <li>•Hazard Quotients (HQ) all below one</li> <li>•Cancer risks were either below <math>10^{-6}</math> or comparable to reference risks</li> </ul>	No unacceptable risks associated with direct contact exposures
Adult – shellfish ingestion	<ul style="list-style-type: none"> <li>•HQ's all below one</li> <li>•Cancer risks were either below <math>10^{-6}</math> or comparable to reference risks</li> </ul>	No unacceptable risks associated with shellfish ingestion exposures
Adult – fish ingestion	<ul style="list-style-type: none"> <li>•HQ's all below one or comparable to reference risks</li> <li>•Cancer risks were either below <math>10^{-6}</math> or comparable to reference risks</li> </ul>	No unacceptable risks associated with fish ingestion exposures
<b>ECOLOGICAL RISK ASSESSMENT</b>		
Benthic Invertebrate Community	<ul style="list-style-type: none"> <li>•Limited toxicity observed in the 1993/94 bioassays likely associated with ammonia or other confounding factors.</li> <li>•Based on 2005 results, most sediment concentrations below risk-based thresholds and reference</li> </ul>	No unacceptable risk posed to benthic community at IR Site 20
Fish Community	None of the estimated fish tissue concentrations exceeded the risk-based thresholds for any constituent	No unacceptable risk posed to fish at IR Site 20
Avian Community – surf scoter	•In general, chemicals were below risk-based dose thresholds and/or reference, particularly in 2005 dataset	No unacceptable risk posed to birds at IR Site 20
Avian Community – least tern	<ul style="list-style-type: none"> <li>•No exceedance of highest risk-based thresholds at realistic site use factors.</li> <li>•Risks generally comparable to reference</li> <li>•Small exposure areas relative to total foraging area.</li> </ul>	
Avian Community – double-crested cormorant	<ul style="list-style-type: none"> <li>•No exceedance of highest risk-based thresholds at realistic site use factors</li> <li>•Risks generally comparable to reference</li> <li>•Small exposure areas relative to total foraging area</li> </ul>	



## SUMMARY OF SURFACE SEDIMENT CHEMISTRY FOR IR SITE 24

**BRAC  
PMO**

- Based on evaluation of the 2005/2006 data:
  - Total PAH, pesticides, Total PCB, and several metal concentrations exceeded risk-based sediment benchmarks in the sediment shelf located nearshore and under the roadway in the northeastern corner of the site.
  - For the open water portions of the site, no inorganic constituent exceeded risk-based sediment benchmarks, except nickel and silver. Total PAHs, pesticides, and Total PCBs were below risk-based sediment benchmarks, except for Total PCBs at one location.
- Based on the older data sets:
  - Exceedances of risk-based sediment benchmarks for inorganic constituents and total PAHs in the northeast corner and for *alpha*-chlordane and 4-4' DDT at two locations
  - Total PCBs were above the risk-based sediment benchmarks at several locations in 1996 and 1998
  - Similar results were not obtained near these locations during 2005 sampling



## ERA: SUMMARY OF RESULTS FOR IR SITE 24

**BRAC  
PMO**

- Benthic Invertebrate Community
  - Based on 2005/2006 results, most sediment concentrations over the majority of the site were below risk-based thresholds and/or reference
- Fish Community
  - The estimated fish tissue concentrations were generally below risk-based thresholds and/or reference over the majority of the site
- Avian Community
  - Risks were generally comparable to reference over the majority of the site
  - Using realistic exposure parameters, risks were relatively low
  - Risks associated with 2005 data were much lower
- Based on these results, any limited potential for adverse impacts at IR Site 24 are primarily associated with the sediment shelf in the northeast corner that extends east of the quay wall between outfalls J and K.



## SUMMARY OF RISK ASSESSMENT CONCLUSIONS FOR IR SITE 24

**BRAC  
PMO**

Assessment Endpoint	Summary of Risk Characterization	Conclusions
<b>HUMAN HEALTH RISK ASSESSMENT</b>		
None	•No complete exposure pathways identified	No unacceptable risk posed to human health at IR Site 24
<b>ECOLOGICAL RISK ASSESSMENT</b>		
Benthic Invertebrate Community	<ul style="list-style-type: none"> <li>•High variation observed in the 1998 toxicity test results may be due to confounding factors associated with the methods, particularly given that the reference stations also exhibited significant toxicity.</li> <li>•Total PAH, pesticides, Total PCB, and several metal concentrations exceeded ER-Ms in 2006 sediment samples collected in the sediment shelf located nearshore and under the roadway in the northeastern corner of the site.</li> <li>•Based on 2005/2006 results, most sediment concentrations over the majority of the site are lower than risk-based thresholds and reference concentrations, except in the northeastern corner and the sediment shelf east of the quay wall between outfalls J and K. Because no bioassays were conducted in this area, the potential toxicity of these sediments is unknown.</li> </ul>	Any potential for adverse impacts to benthic community at IR Site 24 appears to be limited to the northeastern corner.
Fish Community	<ul style="list-style-type: none"> <li>•Cd and Ag were the only chemicals potentially posing a risk to the fish community; potential risks only associated with deeper sediments in the northeastern corner and the sediment shelf east of the quay wall between outfalls J and K.</li> </ul>	Any potential for adverse impacts to fish at IR Site 24 appears to be limited to the northeastern corner.
Avian Community– surf scoter	<ul style="list-style-type: none"> <li>•No exceedance of highest risk-based thresholds</li> <li>•Any limited potential for risks primarily associated with northeastern corner and the sediment shelf east of the quay wall between outfalls J and K.</li> </ul>	Any potential for adverse impacts to birds at IR Site 24 appears to be limited to the northeastern corner.
Avian Community– least tern	<ul style="list-style-type: none"> <li>•No exceedance of highest risk-based thresholds</li> <li>•Any limited potential for risks primarily associated with northeastern corner and the sediment shelf east of the quay wall between outfalls J and K.</li> </ul>	
Avian Community– double-crested cormorant	<ul style="list-style-type: none"> <li>•No exceedance of highest risk-based thresholds</li> <li>•Any limited potential for risks primarily associated with northeastern corner and the sediment shelf east of the quay wall between outfalls J and K.</li> </ul>	

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OAKLAND INNER HARBOR & PIER AREA RI

APRIL 2007



## REMEDIAL INVESTIGATION CONCLUSIONS

**BRAC  
PMO**

• **IR Site 20**

- Risks to ecological receptors are insignificant and comparable to reference
- Risks to human health are consistent with reference conditions
- No further action is recommended

• **IR Site 24**

- Sediment investigations indicate that most concentrations over the majority of the site are lower than risk-based thresholds and reference concentrations, except in the northeastern corner and the sediment shelf east of the quay wall and under the roadway between outfalls J and K
- Risks to ecological receptors are acceptable over the majority of the site, but there is an indication for the potential for adverse effects in the area of elevated sediment concentrations
- Further evaluation or a Feasibility Study is recommended for a small area of elevated sediment concentrations located in the sediment shelf east of the quay wall and beneath the roadway between outfalls J and K, which are between Piers 1 and 2

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OAKLAND INNER HARBOR & PIER AREA RI

APRIL 2007



# QUESTIONS

**BRAC  
PMO**



**ATTACHMENT B-3**

**OFFSHORE SI REPORT FOR WESTERN BAYSIDE AND BREAKWATER BEACH**

**(13 Pages)**



**BRAC  
PMO**

**DRAFT SITE INSPECTION REPORT  
FOR WESTERN BAYSIDE AND  
BREAKWATER BEACH  
ALAMEDA POINT,  
ALAMEDA, CALIFORNIA**

**RAB Meeting  
April 5, 2007**

Mary Parker  
Navy Project Manager

Jennifer Holder  
Arcadis BBL



**LIST OF TOPICS/AGENDA**

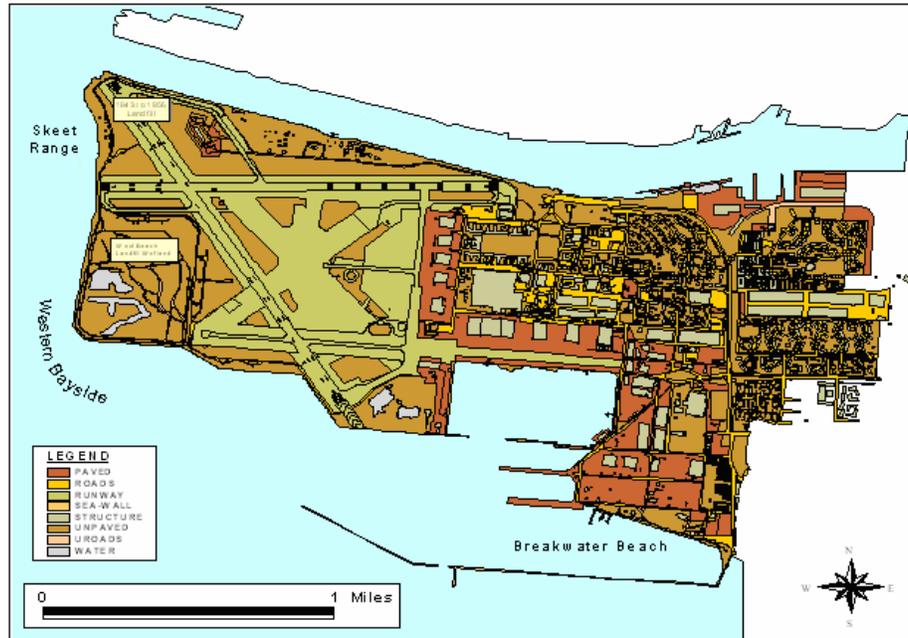
**BRAC  
PMO**

- **Site Location**
- **Site Inspection Approach**
- **Site History and Sample Locations**
- **Data Evaluation**
- **Human Health Risk Assessment**
- **Ecological Risk Assessment**
- **Conclusions of the Site Inspection**



## SITE LOCATION MAP

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WESTERN BAYSIDE & BREAKWATER BEACH SI

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## SITE INSPECTION APPROACH

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- The SI was conducted in accordance with the Offshore Core Study Workplan (May 2005) and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requirements
- Sediment is the primary medium for both human and ecological exposures
  - Evaluated direct contact to sediment and uptake from consumption of aquatic organisms
- Used all available sediment data to calculate risks
  - All Years
  - 2005 Surface (0-5 cm) – Western Bayside only
  - 2005 Subsurface (5-25 cm) – Western Bayside only
- Tissue concentrations based on data from laboratory tests as well as concentrations estimated from sediment

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## WESTERN BAYSIDE HISTORY

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- Potential sources of contamination include:
  - Contaminated groundwater discharges impacted by historical activities at IR Site 1 and IR Site 2 (West Beach landfill area)
  - Stormwater and industrial wastes also discharged from NAS Alameda
- Summary of Investigations:
  - Between 1993 and 1996, 34 surface sediment samples were collected
    - Sediment cores collected at 6 locations in 1993/94
      - (0-10 cm, 10-40 cm, 40-70 cm, 85-95 cm)
    - In 1993/94 sediment toxicity was evaluated at 13 locations; uptake of contaminants was evaluated in laboratory tests using sediments from 7 locations
  - In 2005, 22 additional sediment locations were evaluated
    - 3 depths (0-5 cm, 5-25 cm, 25-50 cm)

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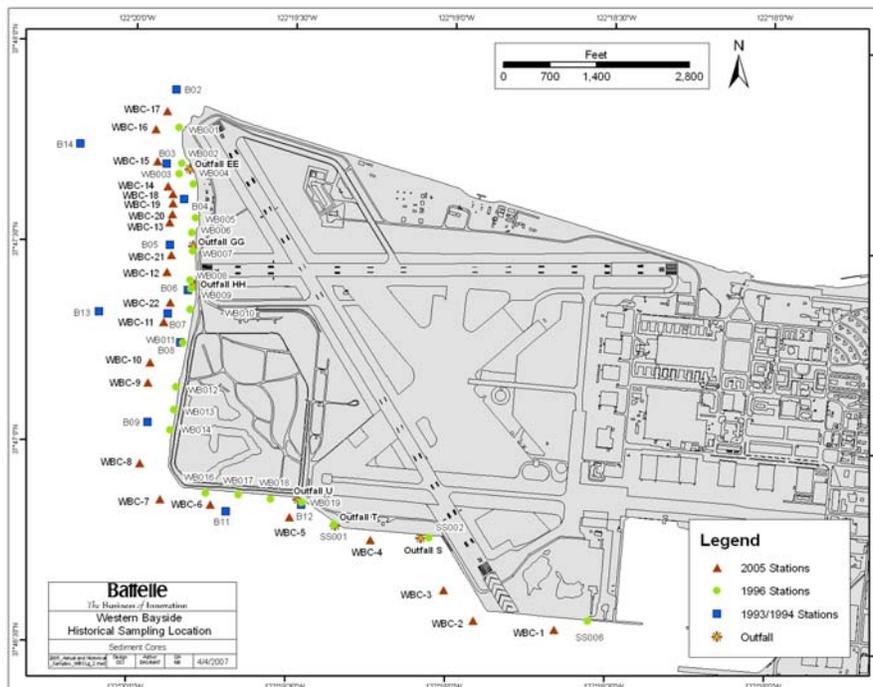
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## SAMPLING LOCATIONS AT WESTERN BAYSIDE

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# BREAKWATER BEACH HISTORY

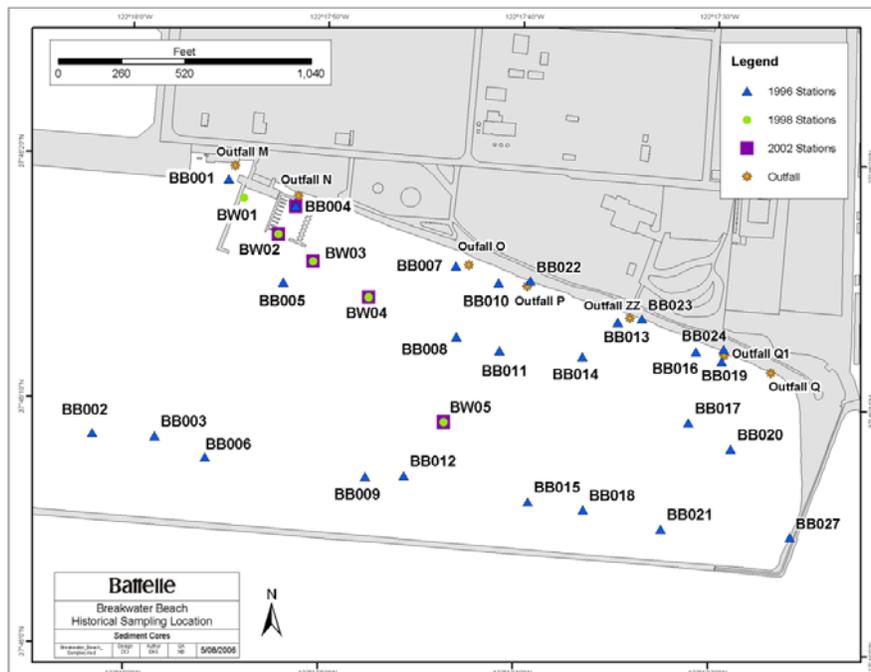
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- **Primary sources of contamination include:**
  - Stormwater and wastewater discharged from storm drains
  - Surface runoff
  - Discharges associated with marina activities
- **Summary of Investigations:**
  - A total of 31 surface sediment samples collected from 1996 through 2002
    - Sediment cores collected at 21 locations in 1996
    - In 1996, sediment toxicity was evaluated in laboratory tests using sediments from 7 locations near outfalls; field-collected mussels from 4 locations were analyzed for the uptake of contaminants
    - In 1998, the toxicity and uptake of contaminants were evaluated in laboratory tests using sediments from 5 locations
    - In 2002, toxicity was evaluated in laboratory tests using sediments from 5 locations



# LOCATION OF BREAKWATER BEACH SAMPLES

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# DATA EVALUATION

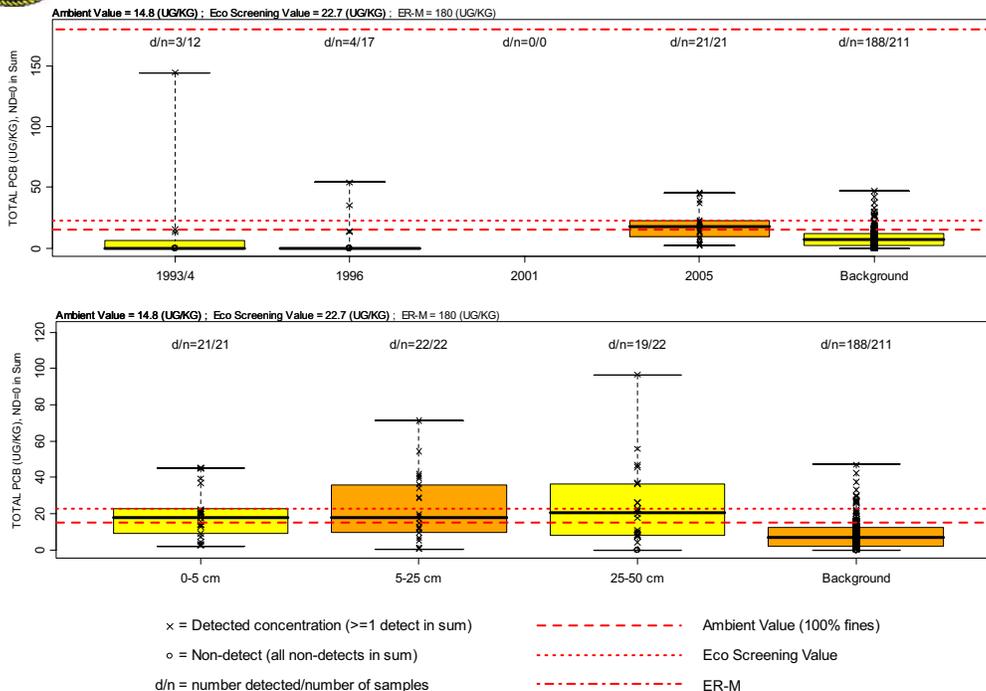
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- Data are presented in side-by-side box plots to evaluate distribution across time and depth
  - Surface samples across years
  - 2005 surface and subsurface
  - Values for risk-based thresholds and ambient concentrations presented for comparison
- Bubble plots depict spatial distribution in surface sediments
  - Each year denoted by different colors
  - Bubble size proportional to concentration
  - Thick lines indicate value exceeds risk-based thresholds



## EXAMPLE SIDE-BY-SIDE BOX PLOT (from Western Bayside)

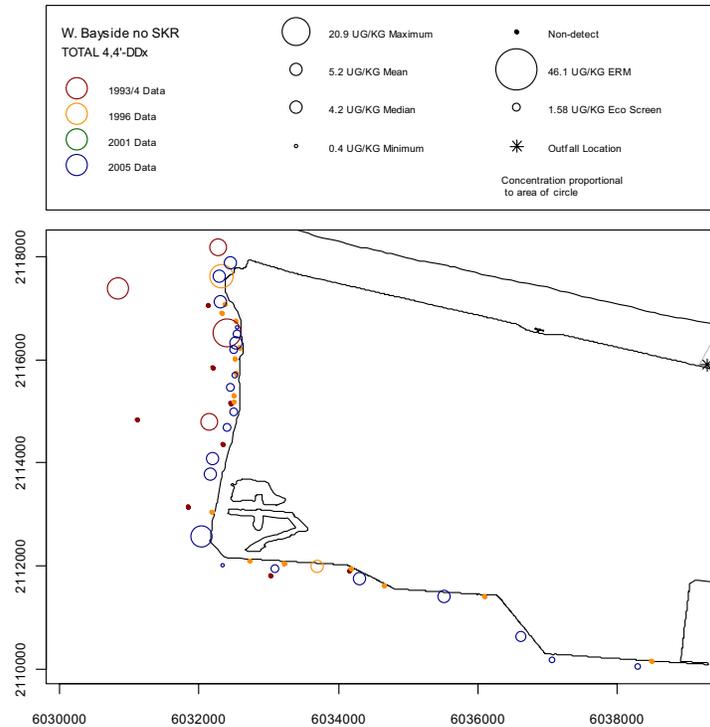
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## EXAMPLE BUBBLE PLOT

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## HUMAN HEALTH RISK ASSESSMENT (HHRA) CONCEPTUAL SITE MODEL

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- **Three chemical exposure pathways identified**
  - **Consumption of shellfish**
  - **Direct contact with sediment while harvesting shellfish**
  - **Consumption of fish**

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# HHRA EXPOSURE FACTORS

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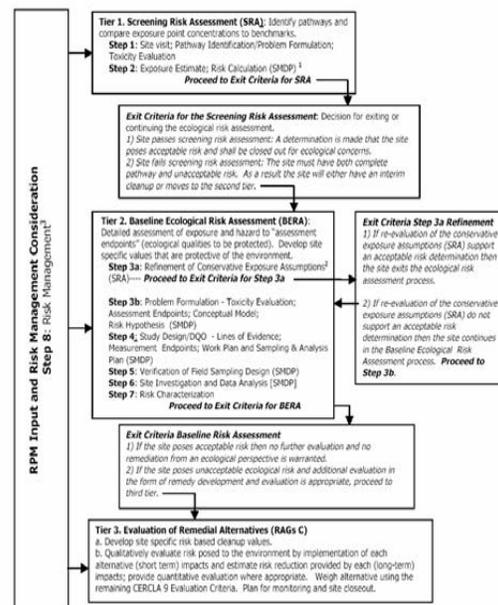
- Human health risk assessment based on standard exposure equations
  - Evaluated both a Central Tendency Exposure (typical) and Reasonable Maximum Exposure
- Fish and shellfish ingestion rates were based on data published by the San Francisco Estuary Institute for San Francisco Bay area



# ECOLOGICAL RISK ASSESSMENT

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- Tiered Approach following Navy and EPA Guidance:
  - Screening-level ecological risk assessment (SLERA) to provide a conservative screen and focus additional assessment activities
  - Baseline ecological risk assessment (BERA) representing a refinement of exposure and effects assessment and characterization of risk

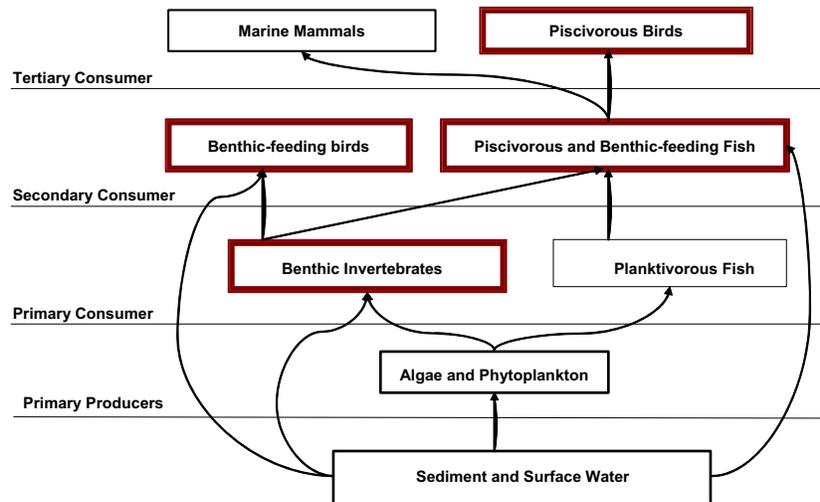


(from CNO, 1999)  
 Notes: 1) See EPA's 8 Step ERA Process for requirements for each Scientific Management Decision Point (SMDF).  
 2) Refinement includes but is not limited to background, bioavailability, detection frequency, etc.  
 3) Risk Management is incorporated throughout the tiered approach.



## ECOLOGICAL RISK ASSESSMENT PROBLEM FORMULATION

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- **Similar Ecological Exposure Pathways were identified at both sites**
  - **Direct exposure with surface sediments**
  - **Indirect exposure through the food-chain**

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## ECOLOGICAL RISK ASSESSMENT ASSESSMENT & MEASUREMENT ENDPOINTS

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- **Benthic Invertebrate Community**
  - **Toxicity in acute and chronic sediment bioassays**
- **Fish Community**
  - **Forage fish tissue concentrations compared to literature-based effects thresholds and reference**
- **Avian Community**
  - **Estimated dietary doses in birds compared to risk-based benchmarks and reference**
    - **Surf scoter**
    - **Double-crested cormorant**
    - **Least tern**

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## **SURFACE SEDIMENT CHEMISTRY FINDINGS – WESTERN BAYSIDE**

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- **Based on evaluation of the 2005 data:**
  - **No inorganic constituent exceeded risk-based sediment benchmarks in surface sediment except for nickel, which was less than background.**
  - **All organic constituents (including PAHs, pesticides, and PCBs) were below risk-based sediment benchmarks in surface sediment.**
- **Based on the older data sets:**
  - **Inorganic constituents antimony, mercury, and nickel exceeded risk-based sediment benchmarks in surface sediment collected in 1993/1994 but not 1996. Mercury only exceeded background at one 1993/1994 location.**
  - **No organic constituents exceeded risk-based sediment benchmarks except Total PCBs and 4,4'-DDT at only one location each.**



## **HHRA RESULTS – WESTERN BAYSIDE**

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- **Direct Contact Exposure Pathway**
  - **Non-cancer Hazard Quotients (HQ) were all below one**
  - **Cancer risks were either below  $10^{-6}$  or less than reference risks**
  - **Cumulative site risk was less than reference risk**
- **Shellfish Ingestion**
  - **HQ's were all below one**
  - **Cancer risks were either below  $10^{-6}$  or similar to reference risks**
  - **Cumulative site risk was less than reference risk**
- **Consumption of Fish**
  - **HQ's were all below one**
  - **Cancer risks were either below  $10^{-6}$  or similar to reference risks**
  - **Cumulative site risk was less than reference risk**



## ERA: SUMMARY OF RESULTS FOR WESTERN BAYSIDE

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- **Benthic Invertebrate Community**
  - Limited toxicity observed in 1993/1994 bioassays is not supported by sediment concentrations
- **Fish Community**
  - None of the estimated fish tissue concentrations exceeded the risk-based thresholds
- **Avian Community**
  - No exceedances of risk-based thresholds in most current data set (2005)
  - For historical data, no exceedances of risk-based thresholds when realistic foraging ranges were used
- **No significant risk to ecological receptors identified**



## SUMMARY OF RISK ASSESSMENT CONCLUSIONS FOR WESTERN BAYSIDE

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Assessment Endpoint	Summary of Risk Characterization	Conclusions
<b>HUMAN HEALTH RISK ASSESSMENT</b>		
Direct Contact	•Hazard Quotients (HQ) all below one •Cancer risks were either below 10 <sup>-6</sup> or less than reference conditions	No unacceptable risks associated with direct contact exposures
Adult – shellfish ingestion	•HQ's all below one •Cancer risks were either below 10 <sup>-6</sup> or comparable to reference conditions	No unacceptable risks associated with shellfish ingestion exposures
Adult – fish ingestion	•HQ's all below one •Cancer risks were either below 10 <sup>-6</sup> or comparable to reference conditions	No unacceptable risks associated with fish ingestion exposures
<b>ECOLOGICAL RISK ASSESSMENT</b>		
Benthic Invertebrate Community	•Limited toxicity observed in the 1993/94 bioassays likely associated with grain size or other confounding factors. •Based on 2005 results, all sediment concentrations below risk-based thresholds and reference conditions	No unacceptable risk posed to benthic community at Western Bayside
Fish Community	None of the estimated fish tissue concentrations exceeded the risk-based thresholds for any constituent	No unacceptable risk posed to fish at Western Bayside
Avian Community – surf scoter	•No exceedances of both low risk-based thresholds and reference conditions	No unacceptable risk posed to birds at Western Bayside
Avian Community – least tern	•No exceedance of highest risk-based thresholds •Based on the 2005 results, risks lower than or comparable to reference conditions	
Avian Community – double-crested cormorant	•No exceedances of both low risk-based thresholds and reference conditions	



## **SURFACE SEDIMENT CHEMISTRY FINDINGS – BREAKWATER BEACH**

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PMO**

- **Based on the older data sets:**
  - **No inorganic constituent exceeded risk-based sediment benchmarks in surface sediment except for nickel, which was less than background**
  - **All organic constituents (PAHs, pesticides, and PCBs) were below risk-based sediment benchmarks in surface sediment**



## **HHRA RESULTS – BREAKWATER BEACH**

**BRAC  
PMO**

- **Direct Contact Exposure Pathway**
  - **Non-cancer Hazard Quotients (HQ) were all below one**
  - **Cancer risks were either below  $10^{-6}$  or similar to reference risks**
  - **Cumulative site risk was less than reference risk**
- **Shellfish Ingestion**
  - **HQ's were all below one or similar to reference**
  - **Cancer risks were either below  $10^{-6}$  or similar to reference risks**
  - **Cumulative site risk was similar to reference risk**
- **Consumption of Fish**
  - **HQ's were all below one or lower than reference risks**
  - **Cancer risks were either below  $10^{-6}$  or similar to reference risks**
  - **Cumulative site risk was less than reference risk**



## ERA: SUMMARY OF RESULTS FOR BREAKWATER BEACH

**BRAC  
PMO**

- **Benthic Invertebrate Community**
  - There is evidence to suggest that the toxicity observed in 1998 was not associated with site conditions, and toxicity was not replicated in 2002 bioassays
  - Based on historical results, most sediment concentrations were below risk-based thresholds and all were below reference
- **Fish Community**
  - None of the estimated fish tissue concentrations exceeded the risk-based thresholds
- **Avian Community**
  - No exceedance of highest risk-based thresholds
  - Risks were generally comparable to reference
  - Using realistic exposure parameters, risks were relatively low
- **There is no significant risk to ecological receptors identified**



## SUMMARY OF RISK ASSESSMENT CONCLUSIONS FOR BREAKWATER BEACH

**BRAC  
PMO**

Assessment Endpoint	Summary of Risk Characterization	Conclusions
<b>HUMAN HEALTH RISK ASSESSMENT</b>		
Direct Contact	<ul style="list-style-type: none"> <li>• Hazard Quotients (HQ) all below one</li> <li>• Cancer risks were either below <math>10^{-6}</math> or less than reference conditions</li> </ul>	No unacceptable risks associated with direct contact exposures
Adult – shellfish ingestion	<ul style="list-style-type: none"> <li>• HQ's all below one or similar to reference conditions</li> <li>• Cancer risks were either below <math>10^{-6}</math> or comparable to reference conditions</li> </ul>	No unacceptable risks associated with shellfish ingestion exposures
Adult – fish ingestion	<ul style="list-style-type: none"> <li>• HQ's all below one or similar to reference conditions</li> <li>• Cancer risks were either below <math>10^{-6}</math> or comparable to reference conditions</li> </ul>	No unacceptable risks associated with fish ingestion exposures
<b>ECOLOGICAL RISK ASSESSMENT</b>		
Benthic Invertebrate Community	<ul style="list-style-type: none"> <li>• High variation observed in the 1998 toxicity test results may be due to confounding factors associated with the methods, particularly given that the reference stations also exhibited significant toxicity and toxicity was not replicated in 2002 bioassays</li> <li>• Based on historical results, most sediment concentrations below risk-based thresholds and all below reference conditions</li> </ul>	No unacceptable risk posed to benthic community at Breakwater Beach
Fish Community	None of the estimated fish tissue concentrations exceeded the risk-based thresholds for any constituent	No unacceptable risk posed to fish at Breakwater Beach
Avian Community – surf scoter	<ul style="list-style-type: none"> <li>• No exceedance of highest risk-based thresholds</li> <li>• Risks were generally comparable to reference</li> </ul>	No unacceptable risk posed to birds at Breakwater Beach
Avian Community – least tern	<ul style="list-style-type: none"> <li>• No exceedance of highest risk-based thresholds</li> <li>• Risks were generally comparable to reference</li> </ul>	
Avian Community – double-crested cormorant	<ul style="list-style-type: none"> <li>• No exceedance of highest risk-based thresholds</li> <li>• Risks were generally comparable to reference</li> </ul>	



## SITE INSPECTION CONCLUSIONS

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PMO**

- **Sediment investigations indicate that most sediment contaminant concentrations at both Western Bayside and Breakwater Beach are lower than risk-based thresholds and/or reference concentrations**
- **Risks to human health are acceptable and consistent with reference conditions at both Western Bayside and Breakwater Beach**
- **Risks to ecological receptors are acceptable and comparable to reference at both Western Bayside and Breakwater Beach**
- **No further action is recommended for both sites**



## QUESTIONS

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**ATTACHMENT B-4**  
**MARCH 2007 BCT ACTIVITIES**  
**(One Page)**

## March 2007 BCT Activities

**OU 5 (Groundwater beneath Coast Guard Housing and Annex) Record of Decision Conference Call, March 6, 2007:** The regulatory agencies have reviewed the draft ROD and submitted comments. Many of the comments speak to the need for greater clarity on the objectives of the Institutional Controls (ICs) and the means by which they will be implemented. The ICs for this ROD are complicated by having the groundwater plume underlie property owned by the Navy and leased to the Coast Guard, property which has been privately developed into the Bayport Housing area and potentially the property of the College of Alameda. The BCT and their legal advisors are working to resolve this issue. The ICs will only be in place for the duration of the remedy which is estimated to be eight years, so they are not long-term ICs.

### **Monthly BCT Meeting March 27, 2006**

The following items were covered in the BCT meeting:

- **PBC-1 Finding Of Suitability to Transfer:** The PBC-1 FOST is being prepared. PBC-1 is the area to the northeast of the Site 26 Western Hangar Zone. Petroleum contamination has been found in this area and has been remediated under the oversight of the Regional Board. There are no CERCLA issues in this area.
- **Basewide Groundwater Monitoring Program:** The BCT discussed which groups of monitoring wells could be taken out of the monitoring program and moved to the remedial action program as part of the operation and maintenance of remedies. Monitoring wells in sites which have a ROD and are beginning to implement the remedies will be the first to be removed from the basewide program.
- **Site Management Plan Update for FY 2008:** The annual update for the SMP will be underway soon, with a draft ready by June. The draft will go to the RAB as well as the regulators for review.