FINAL
NAVAL AIR STATION ALAMEDA
Restoration Advisory Board (RAB) Meeting Minutes

www.bracpmo.navy.mil
950 W. Mall Square
Alameda Point, Building 1, Suite 140
Alameda, California 94105

June 3, 2010

The following participants attended the meeting:

Co-Chairs:

Derek Robinson	Base Realignment and Closure (BRAC) Program Management Office (PMO) West, BRAC Environmental Coordinator (BEC), Navy Co-chair
Dale Smith	Restoration Advisory Board (RAB) Community Co-chair

Attendees:

RAB Members

George Humphreys
Joan Konrad
James Leach
Kurt Peterson
Michael John Torrey

Community Members

Eldon Brodie, USS Hornet Air Museum
Susan Galleymore
Nancy Gormley
Bill Smith

Navy Members

David Darrow	Navy Remedial Project Manager (RPM)
Jacques Lord	Navy RPM
Cecily Sabedra	Navy RPM

City of Alameda Representatives

Frank Matarrese	Alameda City Council
Peter Russell	Alameda Reuse and Redevelopment Authority (ARRA)

Regulatory Agencies

Anna-Marie Cook	U.S. Environmental Protection Agency (EPA)
Dave Cooper	EPA
James Fyfe	California Environmental Protection Agency Department of Toxic Substances Control (DTSC)
John Kaiser	San Francisco Bay Regional Water Quality Control Board (Water Board)
Dot Lofstrom	DTSC
Xuan-Mai Tran	EPA
John West	Water Board

Contractors

Kristie Diller	AMEC Earth & Environment
John McMillan	Shaw
Tommie Jean Valmassy	ChaduxTt

The meeting agenda is provided as Attachment A.

MEETING SUMMARY

Dale Smith (community co-chair) called the June 2010 former Naval Air Station Alameda (Alameda Point) Restoration Advisory Board (RAB) meeting to order at 6:30 p.m. A round of introductions was conducted. During the introductions, Derek Robinson (Navy co-chair) noted that this RAB meeting is the last for Dot Lofstrom (DTSC) because she is moving to other projects. Mr. Robinson and several RAB members thanked Ms. Lofstrom for her work on the project. Anna-Marie Cook (U.S. EPA) noted that when Ms. Lofstrom joined the project, only one Record of Decision (ROD) had been signed at Alameda Point; now there are 16 RODs signed.

John Kaiser (Water Board) noted this regular RAB meeting will be his last as well. The Water Board is not currently hiring, so another Water Board employee, Alec Naugle, is taking over Mr. Kaiser's duties, but may not be able to attend RAB meetings. It was noted that John West (Water Board) will continue to attend.

I. Approval of May 2010 RAB Meeting Minutes

Ms. Smith asked for comments on the May 2010 RAB meeting minutes. Ms. Smith and Michael John Torrey provided minor comments, which will be incorporated into the final set of minutes for May 2010. The May 2010 RAB meeting minutes were approved as corrected.

II. Co-Chair Announcements

Mr. Robinson (Navy Co-chair) announced that the Navy has appointed new RPMs. He noted that three Navy RPMs have moved on to other positions in the past 3 months. Those three RPMs are Michelle Hurst, June Wheaton, and Catherine Haran. He introduced a new RPM, Jacques Lord. Mr. Robinson also announced that Bill McGinnis (Navy Lead RPM) did not attend this meeting because he is in Washington D.C. accepting the Chief of Naval Operations Award for Alameda.

Ms. Smith further noted that Jean Sweeney and Jim Sweeney (RAB members) have an excused absence for this evening.

III. Basewide Radiological Update

Mr. Robinson introduced Cecily Sabedra (Navy RPM) to present the *Basewide Radiological Update* (Attachment B-1). Ms. Sabedra reviewed the status of radiological investigations at various sites. During the review of slide 5, Ms. Smith noted that she and George Humphreys (RAB member) had commented in a letter to the Navy that they were disappointed in Navy radiological testing. She added that she feels the radiological testing should take place regardless of whether the Navy is testing the area for volatile organic compounds (VOC). Ms. Sabedra responded she had not yet seen the letter but would review it.

Mr. Humphreys asked about the red dots on slide 5. Ms. Sabedra responded they are groundwater boring locations, and the blue squares are membrane interface probes (MIP). Mr. Robinson noted there are no radiological sampling points on this figure because it is a general update for Site 1. Ms. Smith asked about the depth of the soil samples in Site 1 outside of the trenching areas. Ms. Sabedra clarified the samples are groundwater. Ms. Smith then asked about the depth of the groundwater samples. Mr. Robinson responded that the depths vary and added the Navy is drilling down to measure the relative concentrations of VOCs, and the goal is to define the plume.

Mr. Humphreys said he recalls a radium disposal pit that was supposed to be part of a time-critical removal action that was not undertaken because that pit was part of Area 1B. He asked if the pit has since been removed. Mr. Robinson said the Navy tried to remove the radium disposal area, which was a trench, but was unsure whether all of it had been excavated. He added that all of Area 1B is now being removed down to the Bay Mud. Mr. Humphreys asked if the Navy is sure that the trench is located in Area 1B. Mr. Robinson responded the Navy is not certain, but expects it to be located in Area 1B. Ms. Smith asked if the Navy would collect sidewall samples

to make sure all contamination is removed. Mr. Robinson stated this excavation extents will be defined by pre-design sampling, engineered to cover a large area, and will include sampling under the rip-rap. Ms. Smith asked if the Navy is aware of the problems encountered in excavating to depth next to the rip-rap at former Naval Station Treasure Island. There were significant water infiltration issues. Mr. Robinson said the Navy is aware of these problems.

Ms. Sabedra moved on to the review of Site 32. Mr. Humphreys asked how the Navy would be scanning for radiological constituents at the site, whether discrete samples would be collected or a buggy used to scan the surface. Ms. Sabedra stated surface scans will be conducted. Mr. Humphreys asked if the equipment can scan to the depth of few inches. Mr. Robinson said the equipment has improved and now can scan to a greater depth.

Mr. Robinson moved on to the update for Site 2. On slide 11, he noted that the title should read "Site 2" rather than "Site 1." During the discussion on Site 2, Ms. Smith noted the field work will begin during the rainy season. She asked how the rainy season might affect work and if the Navy would have to omit certain areas because of wet and muddy conditions. Mr. Robinson said the Navy tries to schedule the work around the rainy season when possible, but if not possible; no areas will be omitted in delineating the contamination at Site 2 because of wet conditions.

During the update of the Sites 5 and 10 storm drain removal, Frank Matarrese (Alameda City Council) asked if the Navy is only removing the storm drains or if they are being replaced. Mr. Robinson said they are being replaced. Mr. Matarrese said the City of Alameda is interested in the specifications for the new storm drains. The concern is that the new storm drains may not meet future, or even current, code. Mr. Matarrese asked that comprehensive information on the new storm drains be provided to the city manager. Mr. Robinson said the specifications will be in the completion report, but he will send the as-built information to Mr. Matarrese to provide to the city manager.

Kurt Peterson asked if a line passes beneath Building 5. Mr. Robinson affirmed that the line exists, and added that the Navy had capped that line as well as other lines that are not being addressed now. He added that the work is a time-critical removal action to remove lines that may be sources of contamination to the Seaplane Lagoon. Other lines will be addressed as part of the cleanup for Operable Unit (OU) 2C.

Mr. Robinson moved on to the update on Seaplane Lagoon. One slide 18, he noted the dredging at the site must be finished before April 2011, when the least tern season begins. Ms. Smith asked why the Navy must finish before April 2011, since the least terns do not usually start feeding until June. Mr. Robinson said the U.S. Fish and Wildlife Service mandated that schedule because the least terns could feed in the Seaplane Lagoon area as early as May, so the Navy must be done dredging prior to then.

Mr. Robinson discussed the basewide radiological surveys that were described in the Historic Radiological Assessment (HRA) but that are not covered under any other site investigations, noting in general the areas discussed are buildings. Ms. Smith said she and Mr. Humphreys told

the Radiological Affairs Support Office (RASO) during a previous RAB meeting that they feel basing investigation locations on historical information is not enough. She asked if the scans Mr. Robinson is describing are the additional scans that will be conducted because radiological contamination was identified when a Geiger counter was mistakenly left on during a site walk. Mr. Robinson responded the basewide scans he is talking about are related to the HRA and are not part of the additional scans that the regulatory agencies and the RAB requested. Mr. Robinson said that, in relation to the additional scans, the Navy has responded by scanning the entire shoreline as well as additional sampling locations and he noted on the map several locations where the Navy collected samples. He said the Navy found a wire with radiological paint and a few other small items. Mr. Robinson said it is not feasible for the Navy to scan the entire base; there is not funding to allow for such an enormous investigation. He noted that, as items are found, the information is used to update the site conceptual model for radiological contamination.

Ms. Smith stated she had seen information indicating that in the 1950s, two airplanes contaminated by the Bikini Atoll atomic test were decontaminated at Alameda Point. Mr. Robinson stated that areas where planes were historically decontaminated have been investigated.

Mr. Humphreys continued that part of the area where Mr. Robinson is discussing sampling, behind Site 2, is called the "chain of sausages" because there is a chain of elliptical-shaped deposits. It was filled during the 1930s, and is not an area where radiological contamination would be expected. Mr. Robinson stated the sampling is intended to detect potential migration. Anna-Marie Cook (EPA) agreed, saying the sampling is intended to evaluate whether Site 2 is similar to Site 1, where contamination migrated over time.

Ms. Cook added that she appreciates the concerns of the RAB members related to the approach for radiological sampling. She suggested the RAB create a work group to meet with the regulatory agencies and identify areas the RAB thinks should be investigated but may be overlooked by the current plan. She noted the RAB would have to prioritize its list and that the number of locations sampled would depend on the budget for the work. Mr. Robinson noted that if the EPA and RAB prepared recommendations for sampling, he would seriously consider them. Mr. Humphreys said he had prepared a write up which he would provide during the RAB comment period showing the additional locations to be sampled for radioactivity. Ms. Smith said that in addition to her and Mr. Humphreys, she assumes Jean Sweeney and Mr. Peterson will want to be involved.

Mr. Peterson said that, from looking at the map, it appears the Navy will sample near Pier 3, which is near the entrance to the USS Hornet museum. He added he was unaware there was a problem in the area. Mr. Robinson said a cesium deck marker was crushed in that area in 1998. A removal was done at the time, but current cleanup levels are even more stringent and instruments are improved, so the Navy is verifying that the contamination is properly addressed for current standards.

IV. Operable Unit 1 Remedial Action Update

Mr. Robinson introduced David Darrow (Navy RPM) to provide an update on the OU 1 work (Attachment B-2). During the review of slide 3, Ms. Lofstrom asked Mr. Darrow to convert the number of cubic yards (cy) to truckloads. Mr. Darrow responded that one truckload is typically 15 to 17 cy. Therefore, removal of 2,900 cy is about 170 to 190 truckloads.

Ms. Smith said that when she and Mr. Humphreys visited Site 7, it appeared to have been partially paved with concrete. Mr. Robinson explained that the material observed is road base, which looks like concrete. He stated the area will be paved within the next several weeks. Ms. Smith asked if the building at that site, Building 459, will be demolished. Peter Russell (ARRA) said the city would also like to obtain the information because the city has a tenant in the building. Mr. Darrow explained the building was "T" shaped, and the southern third of the north/south wing was removed prior to the commencement of remedial activities in October. For the upcoming work, an additional 40 feet of the north/south wing will be removed, leaving the northern third of the north/south wing. The Navy plans to leave the east/west wing in place. Ms. Smith asked if that east/west portion is the location of the former incinerator, and Mr. Darrow confirmed that her statement is correct. Mr. Humphreys asked about the contaminants of concern at the site. Mr. Darrow said that lead is the primary contaminant of concern, and the Navy had also found polycyclic aromatic hydrocarbons (PAH) and copper.

A community member asked where the excavated soil is taken. Mr. Darrow responded it is transported to an appropriate landfill, most likely Kettleman Hills Landfill.

During the review of slide 5, Mr. Peterson asked if the current work at Site 16 is separate from work previously done at Site 16. Mr. Darrow stated the remedial excavation at the shipping container storage area has been completed. The floors of three of the shipping containers were partially removed and the soil beneath them excavated. Ms. Smith asked if the shipping containers are movable. Mr. Darrow stated they would be too difficult to move because they are more than 100 feet long. Moving them would require cutting and crane work.

Mr. Darrow continued that in situ chemical oxidation will be complete at Site 6 in June and at Site 16 in July. Ms. Cook asked Mr. Darrow to clarify what is meant by "complete." Mr. Darrow explained the injections will be complete, but monitoring will continue for about 5 years, depending on the results.

V. July Tour Agenda

Mr. Robinson said the Navy has identified Saturday, July 17, 2010, for an Alameda site tour. Ms. Lofstrom asked how the tour will be advertised. Tommie Jean Valmassy (Tetra Tech) said a press release will be sent to several local papers and bloggers; flyers will be posted at the library, senior center, and other bulletin boards around town; and an e-mail will be sent to the Navy's e-mail distribution list. In addition, a sign-up sheet was passed around so attendees at the current meeting could sign up.

Mr. Robinson said the Navy hopes to tour four sites that day. Ms. Smith stated she had asked the RAB members to bring ideas on sites to visit. The sites were all listed on the board, and then each RAB member was allowed to vote for the four top choices. The top selections included Site 25, Shinsei Gardens; Seaplane Lagoon; Site 24; Site 1; and Corrective Action Area 3. Mr. Robinson said he will take the vote under advisement and will select four sites based on this list as well as considering sites that are accessible.

VI. Community and RAB Comment Period

Mr. Robinson asked if there were any community comments.

Mr. Humphreys said he would like to provide two brief presentations he had prepared. The first he titled Basewide Radiological Contamination (Attachment B-3). During the review of the map on page 5, Mr. Humphreys noted the hatched areas indicate areas that he suspects were filled from the estuary and therefore may be contaminated by radium. Mr. Russell asked why Mr. Humphreys had not hatched the area that was filled from 1947 through 1953. Mr. Humphreys stated he could have hatched the area, but Site 1 has already been surveyed and he didn't want to get carried away. He said that he understood from the Navy's statement that the radium discharges from Building 5 into the estuary had been redirected to the Seaplane Lagoon in 1946.

Mr. Humphreys also presented his report on the Site 25/Operable Unit 5/Installation Restoration 2 Groundwater Plume (Attachment B-4). During his presentation, Mr. Humphreys said that Mr. West stated he would look for the National Pollutant Discharge Elimination System (NPDES) permits for the storm pump station. Mr. West said he searched the archives and was unable to find the permit.

Mr. Robinson thanked Mr. Humphreys for his significant time and effort in preparing and discussing his presentations.

Ms. Smith stated she had begun a cursory review the draft zero-valent iron treatability report and said it appears the study did not work. She noted the comments are due on Sunday, August 1, 2010, and asked that the comment period be extended so the RAB can receive a presentation. Mr. Robinson agreed, also noting that he will try to arrange for a presentation on the treatability study report at the August RAB meeting, and will extend the comment period past that date.

VII. Meeting Adjournment

The meeting was adjourned at 8:30 p.m. There will be no RAB meeting in July. The next RAB meeting will occur at 6:30 p.m. on August 5, 2010, at 950 W. Mall Square.

Action Items

Action Items:	**Previous Item #/ Action Item Status/ Action Item Due Date:**	**Initiated By:**	**Responsible Person:**
1. Request for Presentations: **a.** Bayport sewer systems and change in the plumes over time. **b.** Site 26 cleanup.	1./ Pending/ To Be Determined	RAB	Mr. Robinson
2. Provide as-built specifications on the Sites 5 and 10 storm drain replacement to Mr. Matarrese.	0./ Pending / August 5, 2010	Mr. Matarrese	Mr. Robinson
3. Provide the RAB with a presentation about the zero-valent iron treatability study. Extend the comment period on the document past the August RAB meeting date.	0./Pending/August 5, 2010	Ms. Smith	Mr. Robinson

ATTACHMENT A

NAVAL AIR STATION ALAMEDA
RESTORATION ADVISORY BOARD MEETING AGENDA

June 3, 2010

(1 page)

RESTORATION ADVISORY BOARD

NAVAL AIR STATION, ALAMEDA

AGENDA

JUNE 3, 2010, 6:30 PM

ALAMEDA POINT – BUILDING 1 – SUITE 140
COMMUNITY CONFERENCE ROOM
(FROM PARKING LOT ON W MIDWAY AVE, ENTER THROUGH MIDDLE WING)

TIME	SUBJECT	PRESENTER
6:30 – 6:45	Approval of Minutes	Dale Smith
6:45 – 7:00	Co-Chair Announcements	Co-Chairs
7:00 – 7:30	Basewide Radiological Update	C. Sabedra/D. Robinson
7:30 – 7:45	OU-1 Remedial Action Update	David Darrow
7:45 – 8:00	July Tour Agenda	RAB
8:00– 8:30	Community & RAB Comment Period	Community & RAB
8:30	RAB Meeting Adjournment	

ATTACHMENT B

NAVAL AIR STATION ALAMEDA
RESTORATION ADVISORY BOARD MEETING HANDOUT MATERIALS

B-1 Basewide Radiological Update, presented by Cecily Sabedra and Derek Robinson, Navy (11 pages)

B-2 Operable Unit 1 Remedial Action Update, presented by David Darrow, Navy (4 pages)

B-3 Basewide Radiological Contamination, presented by George Humphreys, RAB (5 pages)

B-4 Site 25/Operable Unit 5/Installation Restoration 2 Groundwater Plume, presented by George Humphreys, RAB (13 pages)

ATTACHMENT B-1

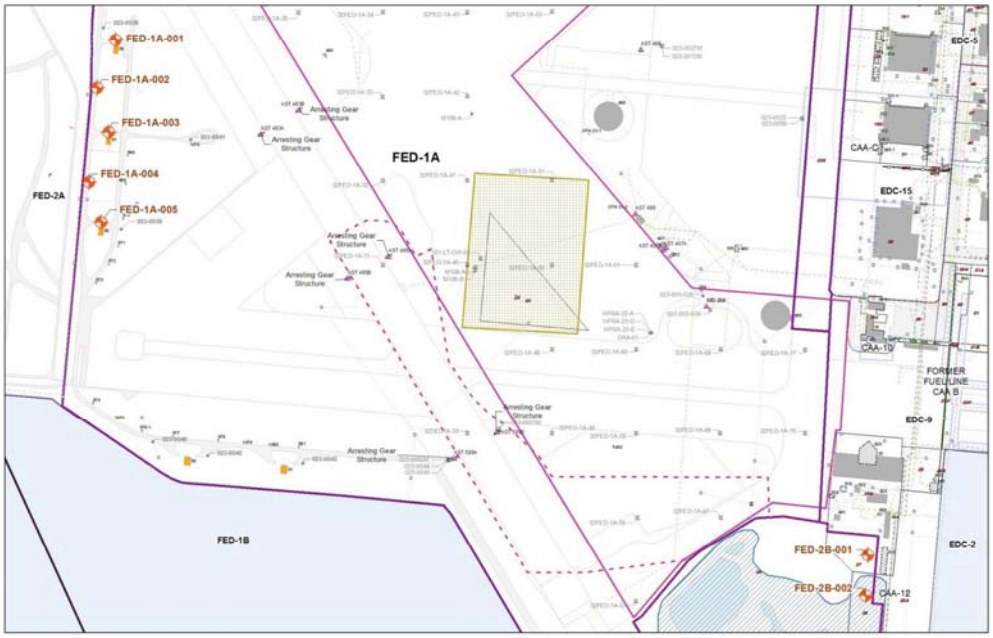
BASEWIDE RADIOLOGICAL UPDATE

(11 pages)

Basewide Radiological Update
Former NAS Alameda, CA
June 3, 2010
D.Robinson/C.Sabedra

TRANSFER PARCELS
FED-1A and FED-2B
RADIONUCLIDE SAMPLING

FED-1A and FED-2B
RADIONUCLIDE SAMPLING



IR SITE 1

IR SITE 1

IR SITE 1

SCHEDULE	
Final Pre-Design Investigation and Sampling Work Plan	May 19, 2010
Pre-Design Investigation Field Work	June 7, 2010 (2 months)
Draft Remedial Design/Remedial Action Work Plan (RD/RAWP)	August 2010
Remedial Action	February 2011 (3 years)

IR SITE 32

IR SITE 32

IR SITE 32

SCHEDULE	
Final Work Plan for Monitoring Well Installation and Sampling	May 19, 2010
Monitoring Well Installation Field Work	June 7, 2010 (2 weeks)
Comments due on Draft Radiological Characterization Work Plan	June 17, 2010
Radiological Characterization Field Work	August 2010 (1 month)
Draft Revised Remedial Investigation/Feasibility Study (RI/FS)	December 28, 2010

IR SITE 2

IR SITE 1

SCHEDULE	
Final WP/SAP for Remedial Action Pre-Design	October 2010
Final Remedial Design	April 2011
Remedial Action	October 2011 (3 years)

IR SITES 5&10 – STORM DRAIN LINES

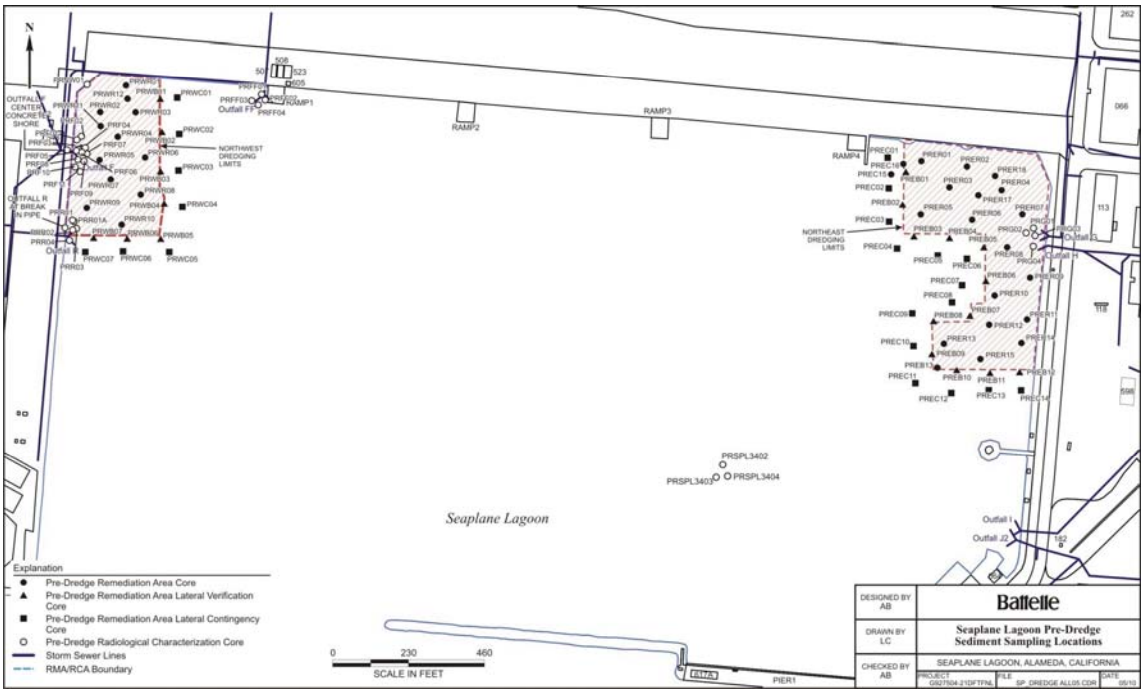
Site 5 Removal of Contaminated Pipe

Sites 5 and 10 Storm Drain Schedule

SCHEDULE	
Removal of Sites 5 and 10 radium-impacted storm drain lines that discharge into the northwestern corner of Seaplane Lagoon and the impacted soil associated with these lines	July 2008 – August 2010
Award of new contract to further delineate and evaluate the extent of radiological contamination in soil/other lines that may be associated with Site 5, the former Naval Air Rework Facility	August 2010
Planning/input from regulatory agencies and RAB on potential sampling locations to include in the Site 5 radiological work plan	September – November 2010

IR SITE 17 - SEAPLANE LAGOON

Sediment Sampling Locations in Seaplane Lagoon



Photos of Sediment Coring and Sampling Vessel

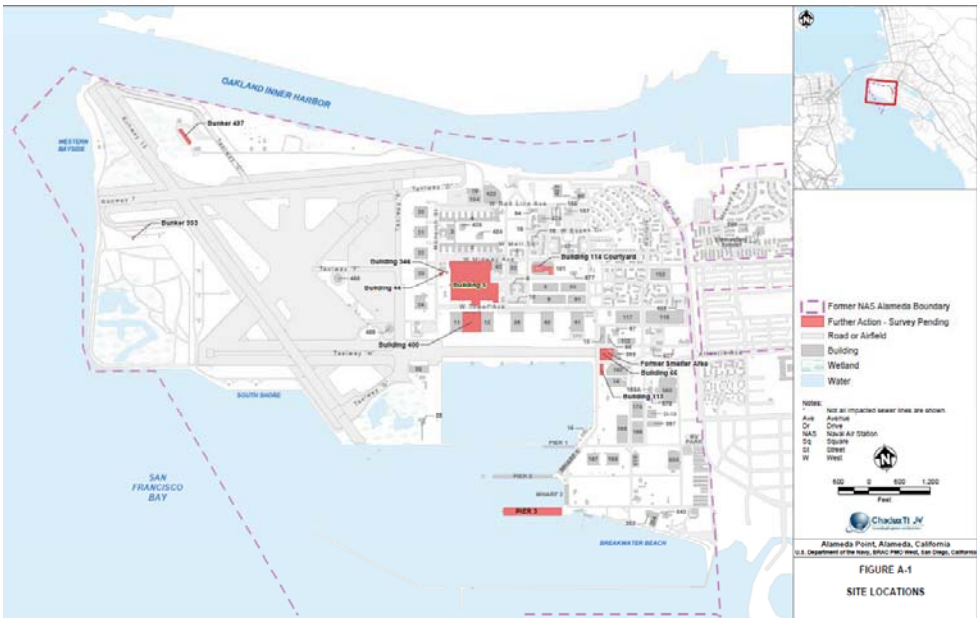
Site 17 Remediation Schedule

SCHEDULE	
Collection of pre-remediation sediment cores for laboratory analysis	April – May 2010
Approval of remedial action work plan incorporating results of sediment sampling	December 2010
Sediment dredging, management, drying, and disposal	January 2011
Completion of Site 17 remediation	December 2011

BASEWIDE RAD SURVEYS

Basewide Radiological Surveys

Buildings 5, 44, 66, 113, 346, 353, 400, 497, Pier 3, B-114 Courtyard, Smelter Area



Basewide Radiological Surveys

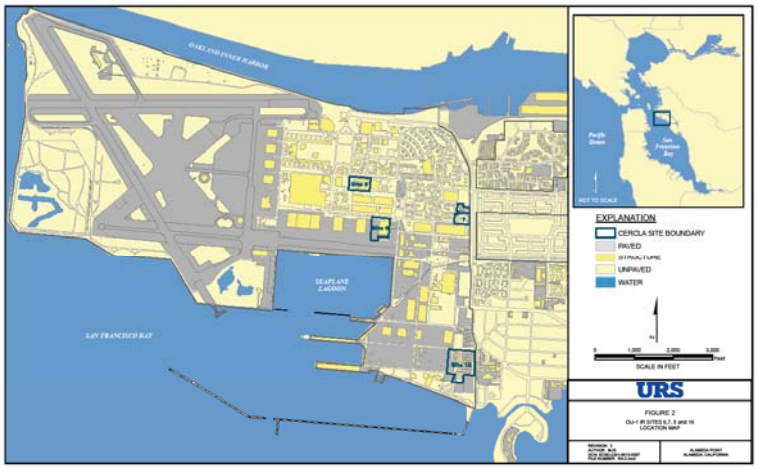
SCHEDULE	
Draft Final Work Plan for Basewide Radiological Surveys	May 31, 2010
Basewide Radiological Surveys	July 6, 2010 (3 months)
Draft Survey Reports	Beginning in November 2010

ATTACHMENT B-2

OPERABLE UNIT 1 REMEDIAL ACTION UPDATE

(4 pages)

Project Status Report
David Darrow
03 June 2010



SOIL REMEDIATION at Sites 7, 8, and 16:
Excavation and disposal of impacted soil

- Mobilized on October 5, 2009
- Excavated ~3100 CY of impacted soil
- Excavation expected to be complete in July

Soil Remedial Action – Site 7

- Demolished southern wing of North-South Building 459.
- Excavated approximately 2,900 CY
- Additional demolition at Building 459 and excavation to be completed after BCT concurrence
- Site 7 expected timeframe for completion is July

Soil Remedial Action – Site 8

- Excavated 5 CY of soil
- Verification sampling confirmed COCs (Lead, PCBs and dieldrin) were less than RGs
- Backfilled and restored to original surface

Soil Remedial Action – Site 16

- Approx 45 CY of lead-impacted soil has been removed
- Excavated approx 200 CY of impacted soil from five locations including Oil/Water Separators OWS 608A and 608B
- Backfilled, compacted and repaved excavations

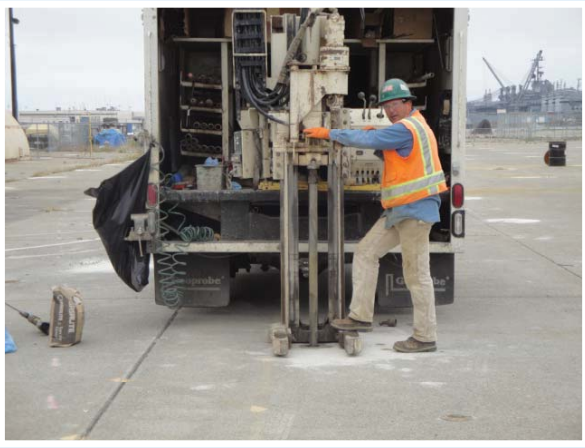
Groundwater Remedial Action – Summary

GROUNDWATER REMEDIATION at Sites 6 and 16: In-situ chemical oxidation using persulfate with ferrous sulfate as activator

- Treatability study conducted in April 2010
- 15 new GW monitoring wells installed

Schedule…

- Mobilized on May 4, 2010
- Completing 6-9 injection locations per day
- Completion of ISCO Injections on Site 6 in June and Site 16 in July



Groundwater RA – Site 6

- Site 6 OWS 040A – Removed OWS and backfilled with gravel-oxidant mix. GW to be monitored at the end of one year.
- Site 6 GW: 170 injections through direct-push borings
  - Treating ~67,200 ft^2

QUESTIONS?

ATTACHMENT B-3

BASEWIDE RADIOLOGICAL CONTAMINATION

(5 pages)

Basewide Radiological Contamination
June 3, 2010
Prepared by George B. Humphreys, PE

Introduction

At the March 4, 2010 RAB meeting, Mr. Derek Robinson, the Navy's Base Environmental Coordinator, announced that pursuant to the Historical Radiological Assessment (HRA) the Navy had investigated some additional storm drains associated with Building 5. These storm drain lines were connected to Outfalls A, B, and G (see Figure-1). These lines were found to have radium contamination, but at levels lower than the levels seen for the Time-Critical-Removal-Action (TCRA) at the sea plane lagoon. Mr. Robinson said that the Navy would investigate and clean up the radium contamination in these lines under CERCLA. The source of the radium was the paint shop in Building 5.

Possible Spread of Radium Contamination

At the April 1, 2010 RAB meeting, I said that I had been thinking about the discharge of radium contamination through outfalls A and B into the estuary and the widespread radium contamination that had been found at Site 1 and 32 outside the disposal cell areas. I said that it was possible that radium contaminated material had been dredged from the estuary and used to fill Sites 1, 32, and the Fed-to-Fed transfer parcels west of the west-hangar zone. This represents an alternative conceptual site model. Note that it also is conceivable that areas along the Oakland side of the estuary could have received radium-contaminated dredge material, depending on the fill sequences.

Fill Sequence at Alameda Point

Figure 2 shows the Alameda Naval Air Station under construction in 1940. In this photo, a building can be seen in the approximate location of Building 5. Filling has progressed westward to encompass the area now occupied by the two most southern hangars in the west hangar zone. The area now occupied by the seaplane lagoon also can be identified.

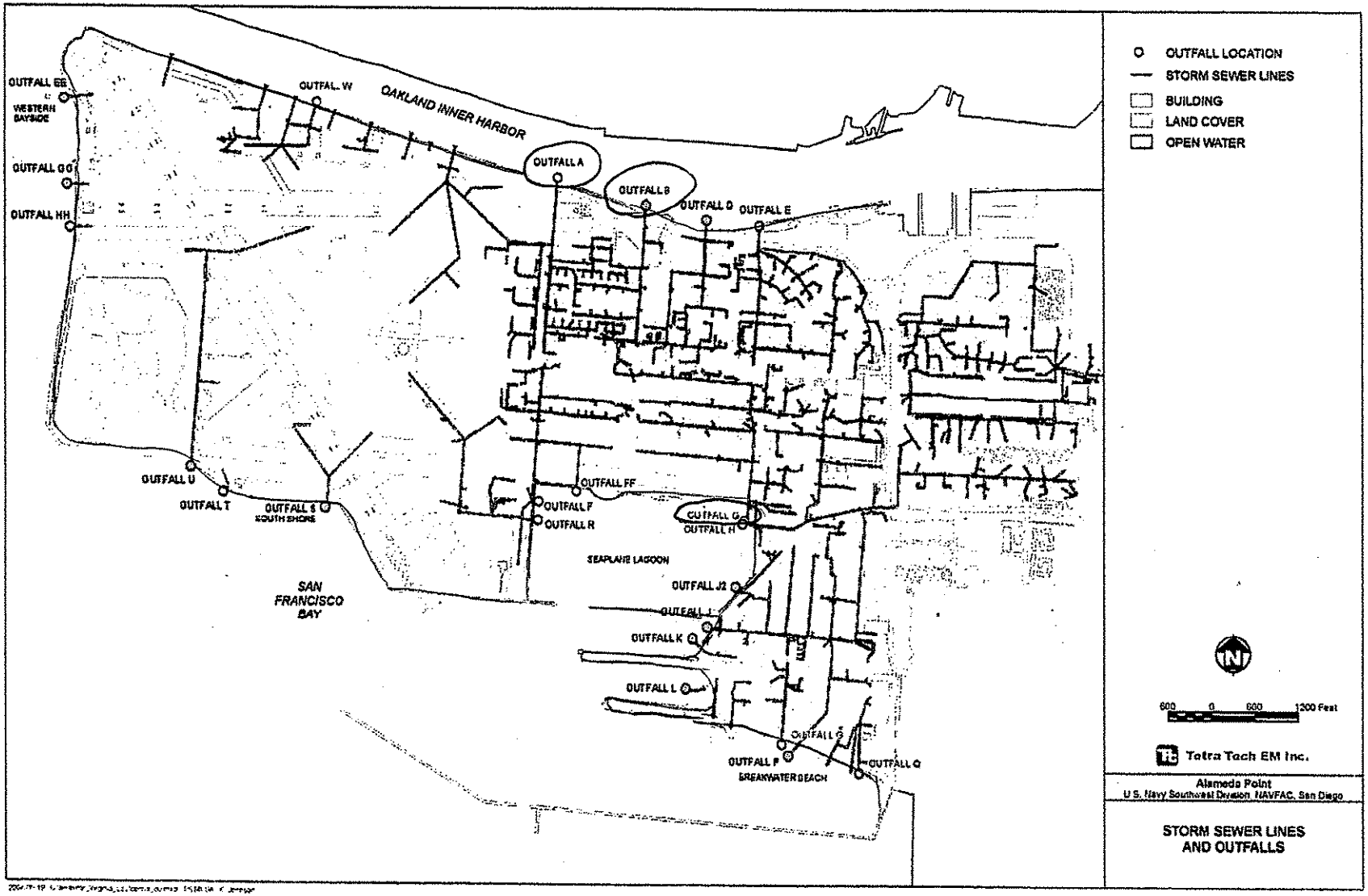
Figure-3 is an aerial view of the Naval Air Station Alameda on Sept. 28, 1984 after all of Alameda Point had been filled.

Figure-4 shows the fill history of Alameda Point adapted from a drawing prepared by Tetra Tech, Inc. The crosshatched areas were filled in during the 1940-1946 time frame. It can be seen that Site 1 and most of the runway area (Fed-to-Fed transfer parcels) were filled between 1940 and 1946. However, the area now occupied by Site-32, the strip along the estuary, the core area of the base (east of the west hangar zone) and the "string-of-sausages" were filled in prior to 1939.

Conclusions

Several conclusions can be drawn:

1. Site 32 had been filled in 1930-1934 and probably wouldn't have been affected by radium contamination dredged from the estuary in 1940 and shortly thereafter.
2. Site 1 and most of the runway areas (Fed-to-Fed transfer parcels) could be contaminated by radium-contaminated fill material dredged from the estuary.
3. The Fed-to-Fed transfer parcels should be surveyed for radium contamination. Also, radiation levels from this area should not be used as radium background levels in determining clean up levels for other areas.



Storm Sewer Lines and Outfalls at Alameda Point

FIGURE-1

Naval Air Station, Alameda under construction in 1940.

FIGURE-2

Aerial view of Naval Air Station, Alameda, California on 28 September 1984.

FIGURE-3

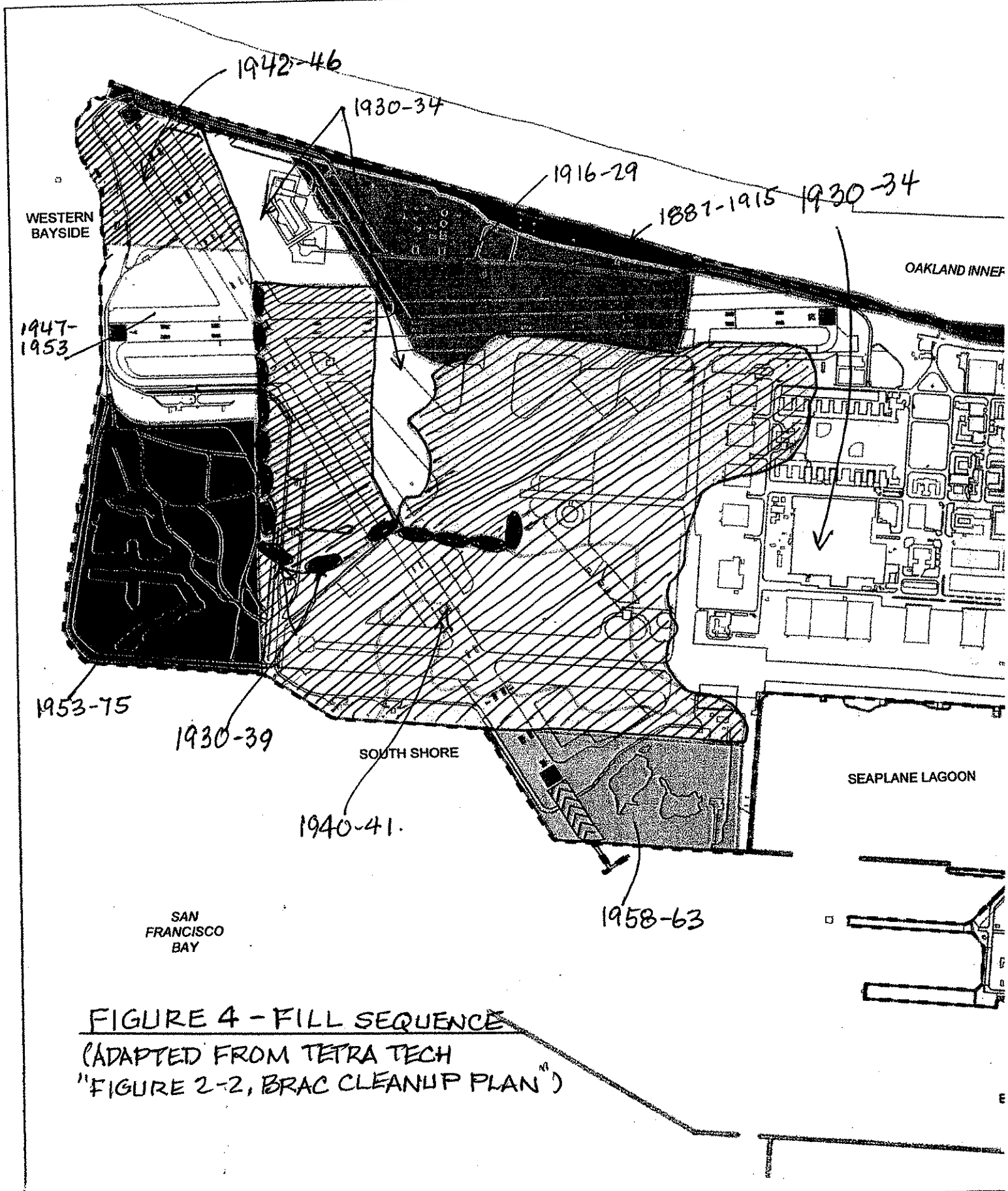


FIGURE 4 - FILL SEQUENCE
(ADAPTED FROM TETRA TECH "FIGURE 2-2, BRAC CLEANUP PLAN")

2003-03-11 U:\almda_sa\OO021\brac\mxd\fig02-02_fill_history.mxd TIEMI-SA K. Johnson

ATTACHMENT B-4

SITE 25/ OPERABLE UNIT 5/ INSTALLATION RESTORATION 2 GROUNDWATER PLUME

(13 pages)

Site 25/Operable Unit 5/IR-02 Groundwater Plume
May 31, 2010
Prepared by George B. Humphreys, P. E.

Background

A large plume (or underground lake) of benzene/naphthalene-contaminated groundwater extends under portions of the former Coast Guard North Housing Area (Installation Restoration, IR, Site 25), the Marina Village Family Housing Area (IR Site 31), the Woodstock Child Development Center/Island High School (IR Site 30), and the former FISC Annex (FISCA IR-02). This plume generally has been described as lying between 10 and 20 ft below grade. There presently is an effort underway by the Navy to remediate part of this plume using a process called biosparging. This entails injecting air below the plume to assist its degradation by endemic aerobic microorganisms, without simple augmentation or added nutrients.

Changes in Shape of the Plume

The shape of the plume appears to have changed with time. Early in the investigations, three main areas of high contamination levels (so-called hot spots) were identified. One was under Kollman Circle in Site 25, a second was under a portion of the Site 30 Woodstock/Island H. S. area, and the third was near the northwest corner of the College of Alameda (near the intersection of Stargell Ave./Tinker Ave. and 5th Street). Figure 1 shows the 1996 configuration of the plume. Figure 2, from a 2002 FISCA Site Management Plan prepared by ERM, shows a similar footprint for the benzene plume based on data from 1998 to 2001. Figure 3, shows the "benzene/naphthalene plume boundary as presented in an Oct. 2008 Navy Fact Sheet. Note that the plume as shown in Figure 3 is elongated in an east-west direction and with a new "hot spot" under Site 31, USCG Marina Village Family Housing. Figure 3 also shows the two initial biosparge treatment areas. Note the approximate location of the storm water pump station near Shinsei Gardens Apartments. For comparison, Figure 4 shows the naphthalene plume footprint, based on 2001 hydro punch data. Note that the highest naphthalene concentration of 19,000 µg per liter occurs near the northwest corner of the College of Alameda. This raises the question of whether treatment of benzene areas alone will cover all areas contaminated with naphthalene.

It also is interesting to view the vertical sections through the plumes as shown in Figures 5 and 6. The highest concentrations of benzene occur some 20 ft below grade and appear to intersect the Marsh Crust layer. This makes it problematic whether the biosparge air is being injected deeply enough to get under the bottom of the plume.

The initial treatment by the Navy involves arrays of air injection wells under the hot spots near Kollman Circle/Shinsei Gardens and under the USCG Marina Village Housing (Site 31). Neither the hot spot under Site 30 Woodstock/Island H. S. nor the hot spot near the northwest corner of the College of Alameda is being treated initially. The southern portion of the Shinsei Gardens apartments does not appear to be covered by the

initial treatment array. The Record-of-Decision (ROD) stated that the remediation of the plume might take eight years.

Warehouses

Five large warehouses (Figure 7) originally occupied the strip of land between the Marina Village Family Housing (IR Site 31) and the East Housing Area (now part of Bayport). The underlying soil in this strip was not well consolidated. The soil under these warehouses had subsided several feet, so that there was a gap between the floors and the underlying soil.

In about 2003, Neil Coe and I observed that the warehouses had been demolished and a large excavation ran through this area. This excavation appeared several hundred yards long, perhaps 100 ft wide and 10 to 15 ft deep. The Catellus construction manager said that a sanitary sewer line was going to be installed in an east-west direction through this excavation, connecting up with an EBMUD sanitary sewage line running under the estuary/turning basin. We mentioned that the plume, contaminated with benzene and naphthalene, might extend into the area that had been excavated. He said that Catellus was aware of this and that odors had been experienced. He said that the excavated soil would be tested before disposal. Later, the City's consultant, Dr. Peter Russell, said that the contamination in the excavated soil was gasoline or of petroleum origin. Another interesting fact is that some of the groundwater samples from IR Site 25 showed the presence of methyl tributyl ether (MTBE). This would indicate a gasoline source of fairly recent origin (within the last 30 years) for some of the contamination.

Storm Water Pump Station

In 2004, the Restoration Advisory Board received a presentation by Mike Blanchard of ERM, a Catellus contractor. This presentation described a large storm water pumping station to be built just east of the present Shinsei Gardens housing development. This pumping station is located several hundred feet west of the junction of Stargell Ave./Tinker Ave. and Fifth St. See Figure 8 for recent photos of the storm water pump station as installed. The pumps would discharge into a low- pressure force main (storm sewer line) running north through the FISCA near its boundary with IR Site 25. This line was to be 8 ft deep, to keep above the contamination plume, and have trench plugs at the pump station and every 100 yds to prevent the migration of contaminants along the new pressurized storm sewer. These four pumps are equipped with a trash rake and are designed to handle a 100-year storm. However, the pumps do not appear to be provided with an emergency power supply, even though the most likely time for an outage of normal power would be during a large storm event.

Although the presentation represented that the pump station did not occupy any of the proposed biosparge treatment zones, it appears to be located squarely inside the plume (between Shinsei Gardens and the northwest corner of the College of Alameda). The bottom of the storm water pump station was described as being 33 ft deep (below the level of the marsh crust). A number of storm water lines join in a union just south of the pump station. These include a 4-ft line running along Stargell Ave. and a 6-ft line

entering from 5th Street. From the union, a single 7-ft reinforced concrete pipe enters the pump station at 23 ft below grade. Figure 9 shows the confluence of storm water lines that existed near the new pump station prior to its construction. There also may be sanitary sewer lines along these two streets. The size, depth, orientation, and type of backfill used along this confluence of lines are unknown to the RAB. We also do not know when these lines were installed or whether they were installed with trench plugs.

Construction of the pump station was projected to require dewatering of the pump station pit for a period of about six months. This dewatering could have removed an appreciable mass of benzene/naphthalene thereby affecting the plume footprint. If dewatering averaged 5 gpm (7,200 gal per day), approximately a million gallons of groundwater would have been removed from the pit over a 6-month period. The dewatering effluent was to have been collected in a tank and treated by sedimentation and activated carbon before discharge into the estuary under an NPDES permit. This could be regarded as a form of pump-and-treat. Both Anna-Marie Cook and Dr. Peter Russell felt that the volume of effluent from pump station dewatering was less than the contractor expected.

Questions and Uncertainties

One question is whether the material surrounding the storm sewer and sanitary sewer lines that converge outside the entrance to the pump station could be providing conduits or pathways for the dispersal/migration of contaminants from the benzene/naphthalene plume and affecting the shape of the plume.

Another question is whether that the 6-month dewatering of the excavation for the construction of the storm water pump station has affected the shape of the plume. Periodic reports under the NPDES permit should have included the volumes of water discharged from the pump station dewatering.

The Navy currently is treating the two hotspots, i.e. near Kollman Circle and in the Marina Village Family Housing Area (IR Site 31). Initial results as reported at the March 4, 2010 RAB meeting were promising, but the Navy could be taking more aggressive action to remedy the entire plume. For instance, should the Navy also be treating the hot spot (between Shinsei Gardens and the northwest corner of the College of Alameda) and the hot spot that once existed under Site 30, Woodstock/Island H.S.? There may also be a question as to whether the "hot spot" of contamination near the northwest corner of the College of Alameda still exists (the Navy's recent maps seem to omit this area as a plume hot spot). It also might be prudent to treat those areas of the overall plume between the hot spots. These questions appear particularly relevant in view of the ROD's projected 8-year treatment schedule, which could be further prolonged if it is later decided to extend the areas to be treated.

The source of the benzene and naphthalene contaminants has still not been identified. It is unclear whether benzene and naphthalene in the plume(s) originated from the same source(s). At one time, it was thought that the stained area (Figure 7) was a former disposal pit that could have been the source of these contaminants. Also,

naphthalene is the largest single component of coal tar, which suggests that it might have originated from the former coal gasification plants along the estuary. Benzene is a by-product of coke, oil and gas production. If the benzene and naphthalene hot spots have penetrated the marsh crust and younger bay mud, as shown in the Figure 5 and 6 cross sections, this could make it difficult to bioremediate by air injection. The Draft Final Remedial Investigation (July 2002) showed the benzene plume as being 500ft long, whereas the naphthalene plume was 2000 ft long. If the benzene and naphthalene plume(s) do not have the same footprints, treating the benzene plume will not necessarily remediate all of the naphthalene.

What volume of soil was excavated along the alignment of the former warehouse area? What contaminants were found? How much contaminated soil was hauled off site and where was it taken?

Conclusions

The shape of the benzene/naphthalene plume, as reported, has changed with time. The plume has been extended in a westward direction to include the area in IR Site 31, USCG Marina Village Family Housing. The northern portion of the plume originally shown under and to the north of IR Site 30, Woodstock/Island H. S. is no longer shown.

The entire plume currently is not being treated by biosparging. The area near the northwest corner of the College of Alameda, the hot spot under Island H. S. and the areas between the hot spots also should be treated to meet the remediation goals. Paving of Stargell Ave./Tinker Ave. and housing construction has covered some of the plume area near the northwest corner of the College of Alameda, but streets could be cut and injection wells installed at a slant under existing housing.

The design of the discharge line from the storm water pump station, at an 8-ft depth and with trench plugs, probably is adequate. However, the effects of the storm water lines and sanitary sewer lines entering or passing through the vicinity of the storm water pump station is unknown

Benzene in Shallow G.W. - 1996

(Source: Alameda Annex RI)

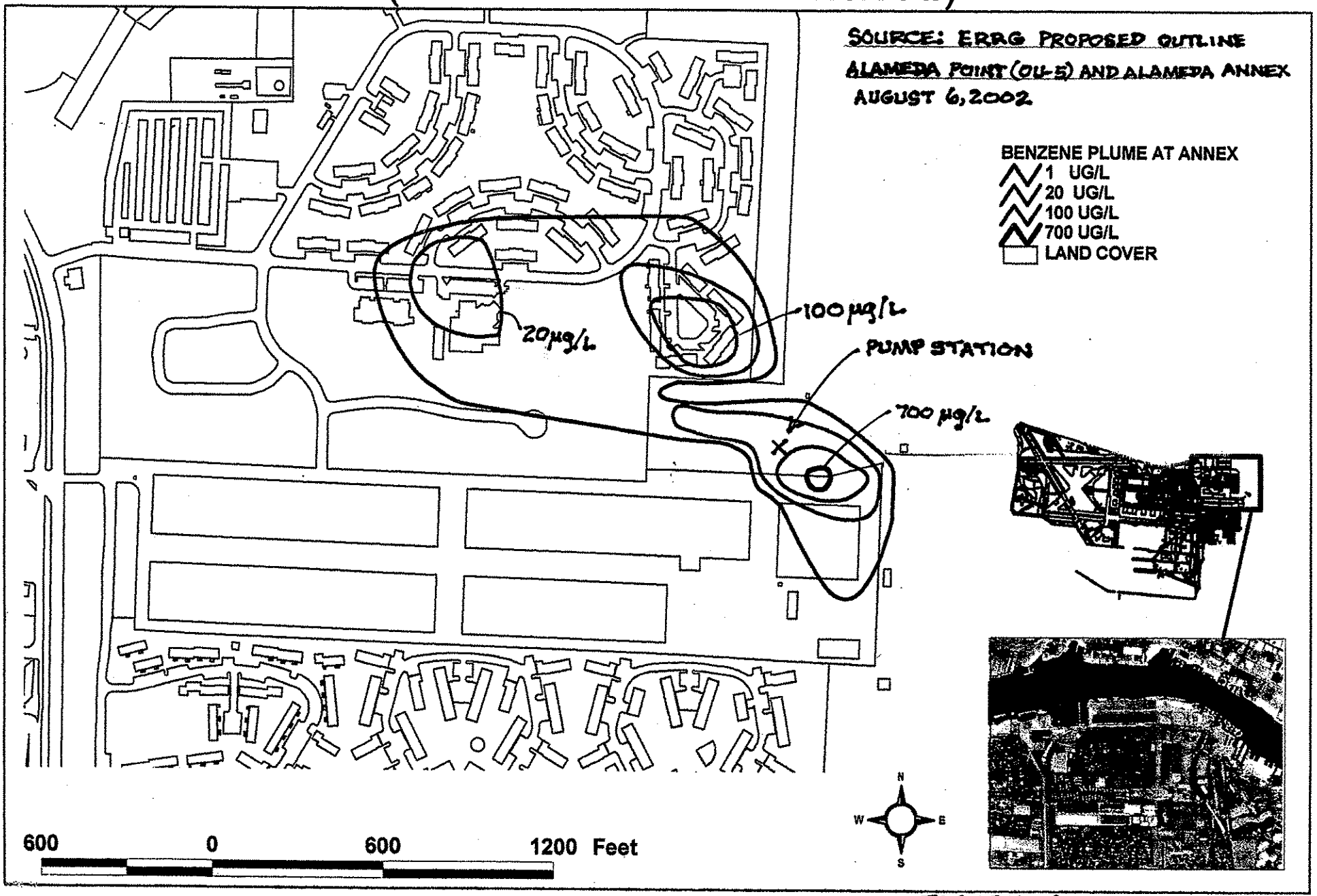
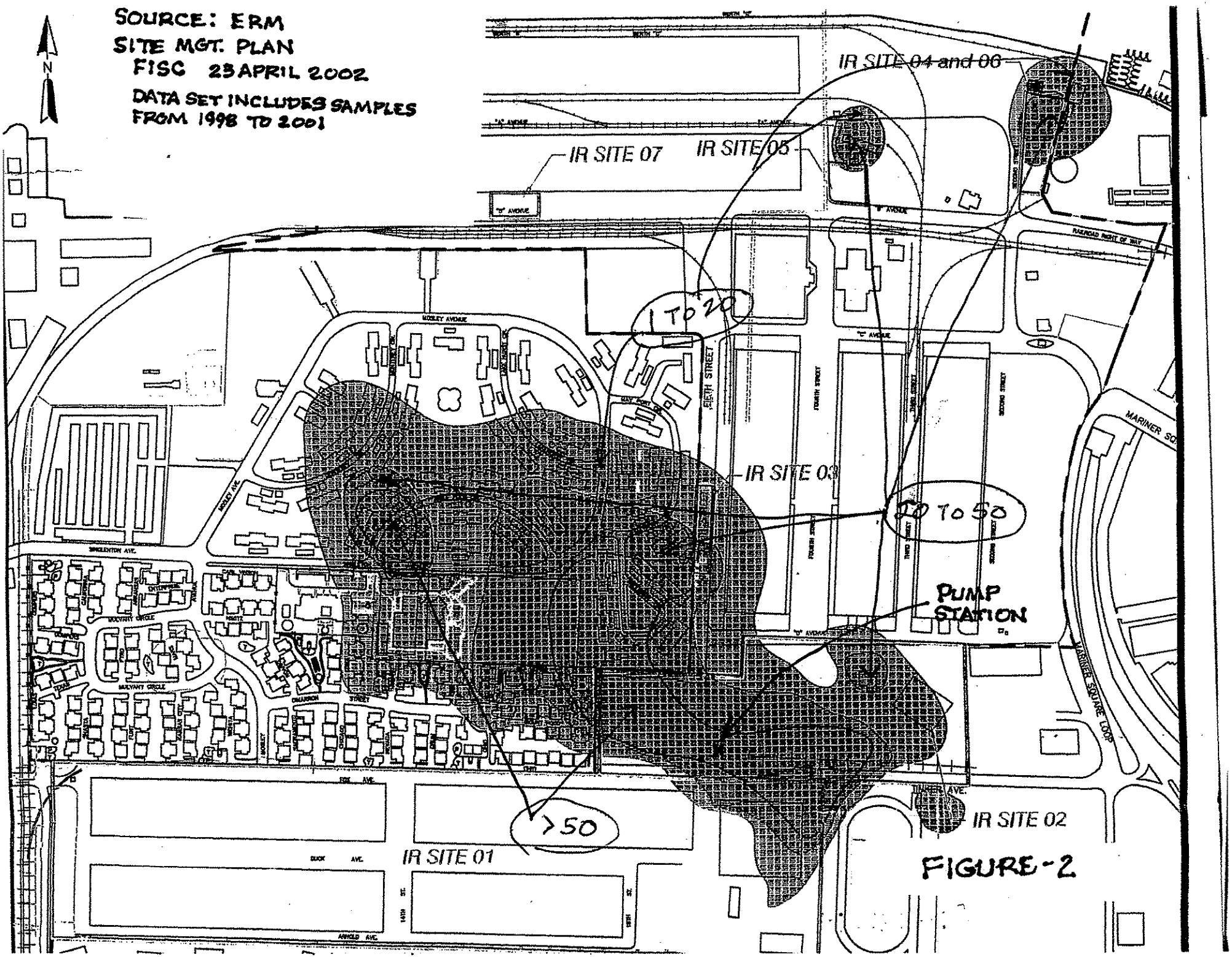
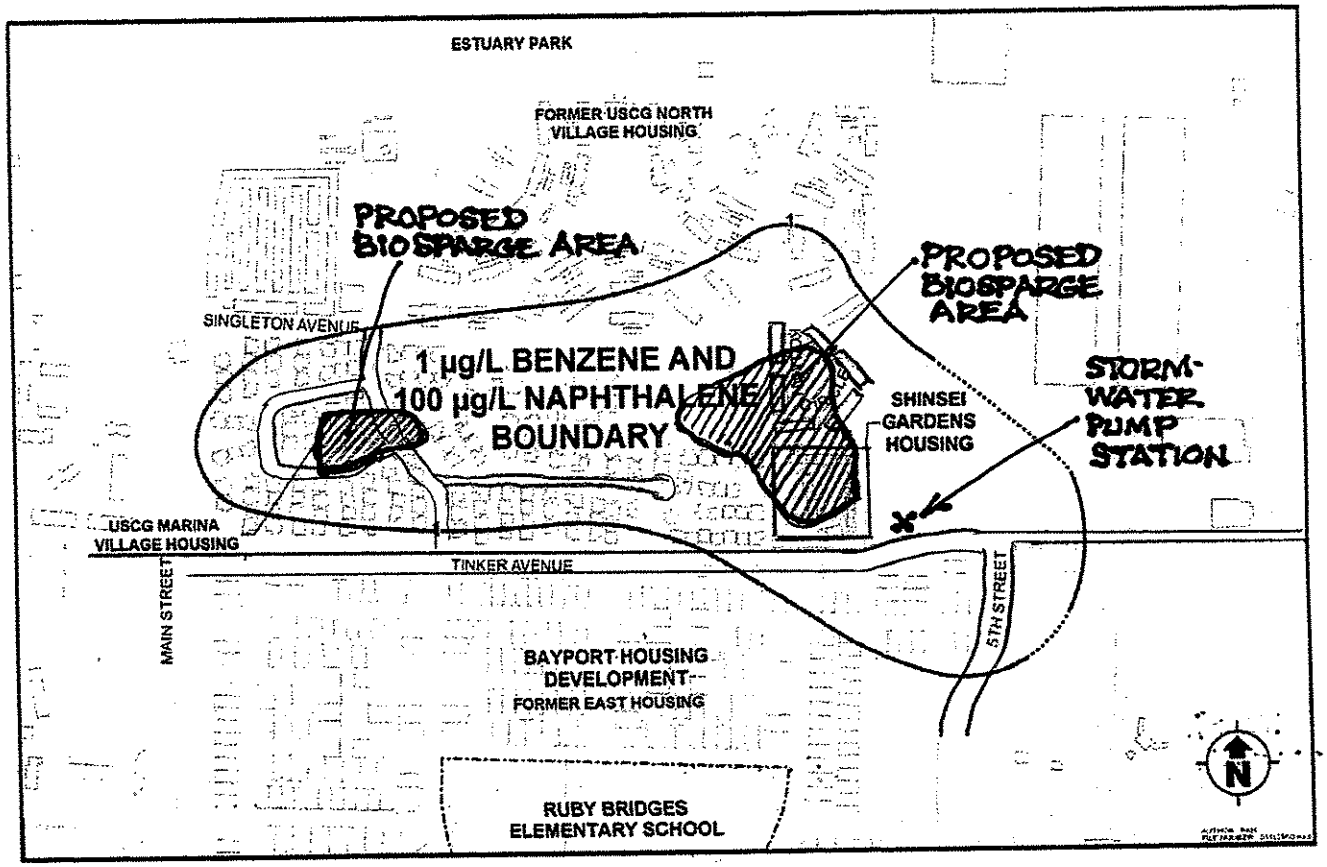


FIGURE-1


SOURCE: ERM
SITE MGT. PLAN
FISC 23 APRIL 2002
DATA SET INCLUDES SAMPLES FROM 1998 TO 2001
N
IR SITE 04 and 06
IR SITE 07
IR SITE 05
1 TO 20
IR SITE 03
20 TO 50
PUMP STATION
>50
IR SITE 01
IR SITE 02
FIGURE-2



OU-5/IR-02 Groundwater Plume

SOURCE: REMEDIAL ACTION AT OU-5/IR-02 FORMER NAVAL AIR STATION ALAMEDA AND FISCA OCT 2008

FIGURE-3

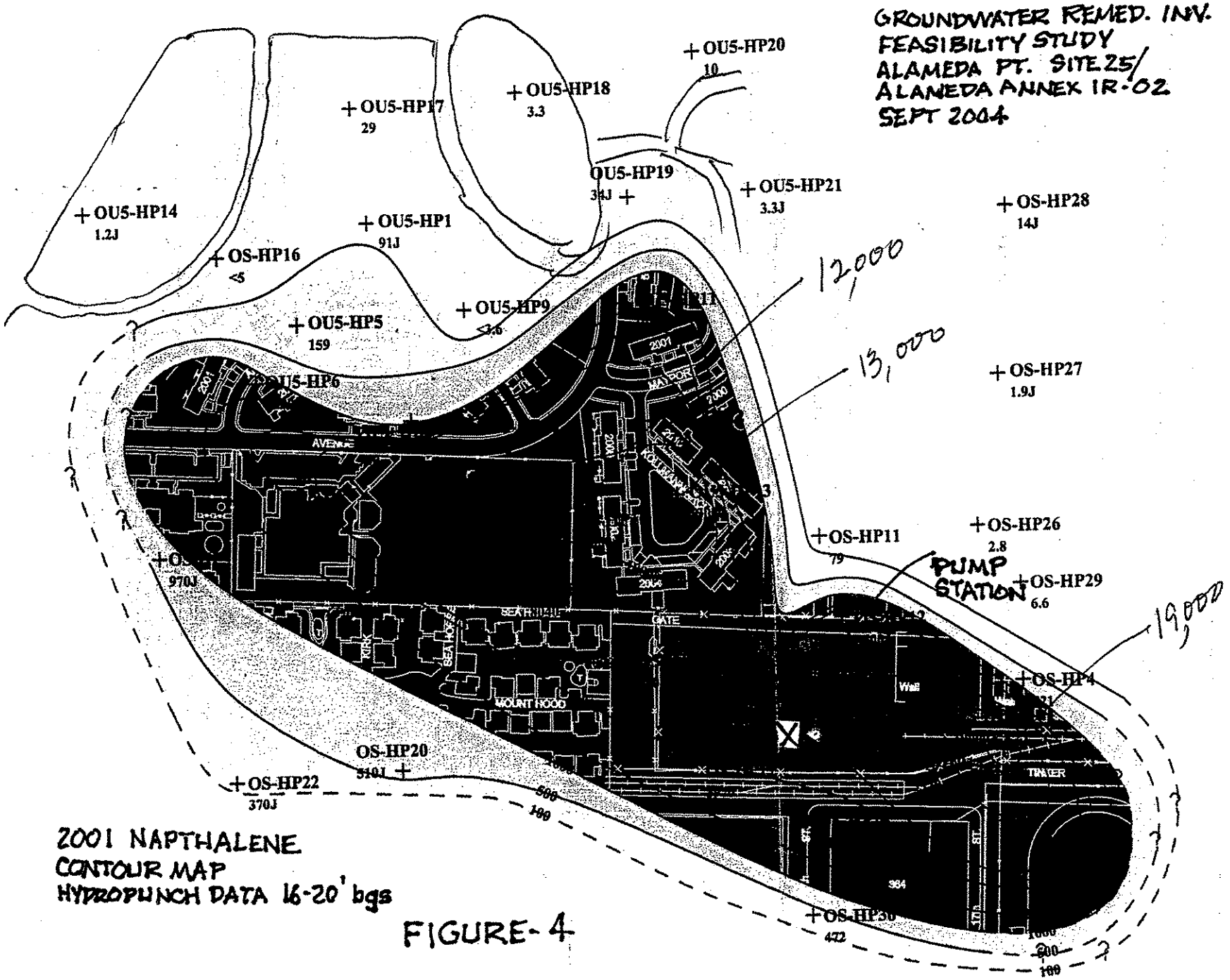
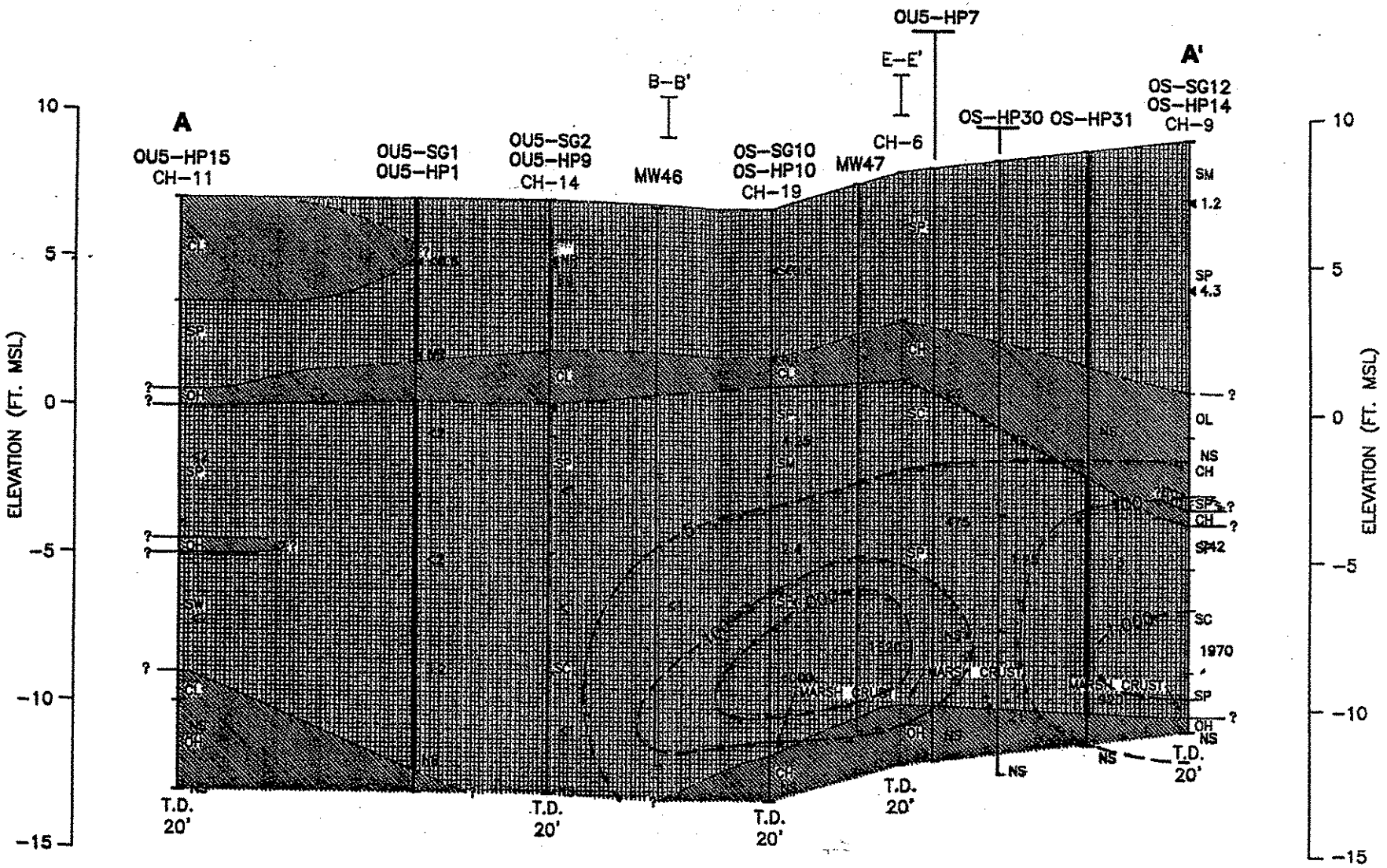
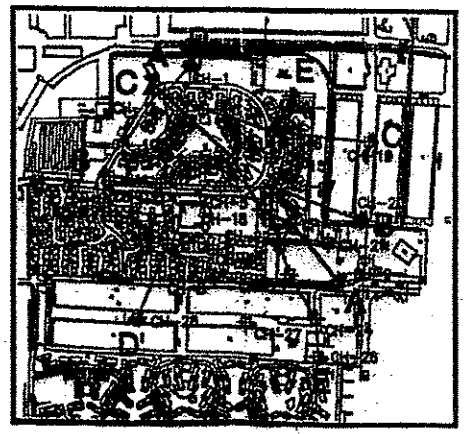

SOURCE: ERRG.
GROUNDWATER REMED. INV.
FEASIBILITY STUDY
ALAMEDA PT. SITE 25/
ALANEDA ANNEX IR-02
SEPT 2004
+ OU5-HP20
10
+ OU5-HP18
3.3
+ OU5-HP17
29
OU5-HP19
34J +
+ OU5-HP21
3.3J
+ OS-HP28
14J
+ OU5-HP14
1.2J
+ OU5-HP1
91J
+ OS-HP16
<5
12,000
+ OU5-HP9
3.6
+ OU5-HP5
159
13,000
+ OS-HP27
1.9J
+ OS-HP11
79
+ OS-HP26
2.8
PUMP STATION
+ OS-HP29
6.6
19,000
+ OS-HP4
+ OS-HP20
510J +
+ OS-HP22
370J
+ OS-HP30
422
2001 NAPTHALENE
CONTOUR MAP
HYDROPUNCH DATA 16-20' bgs

FIGURE-4





INSET

HORIZONTAL SCALE

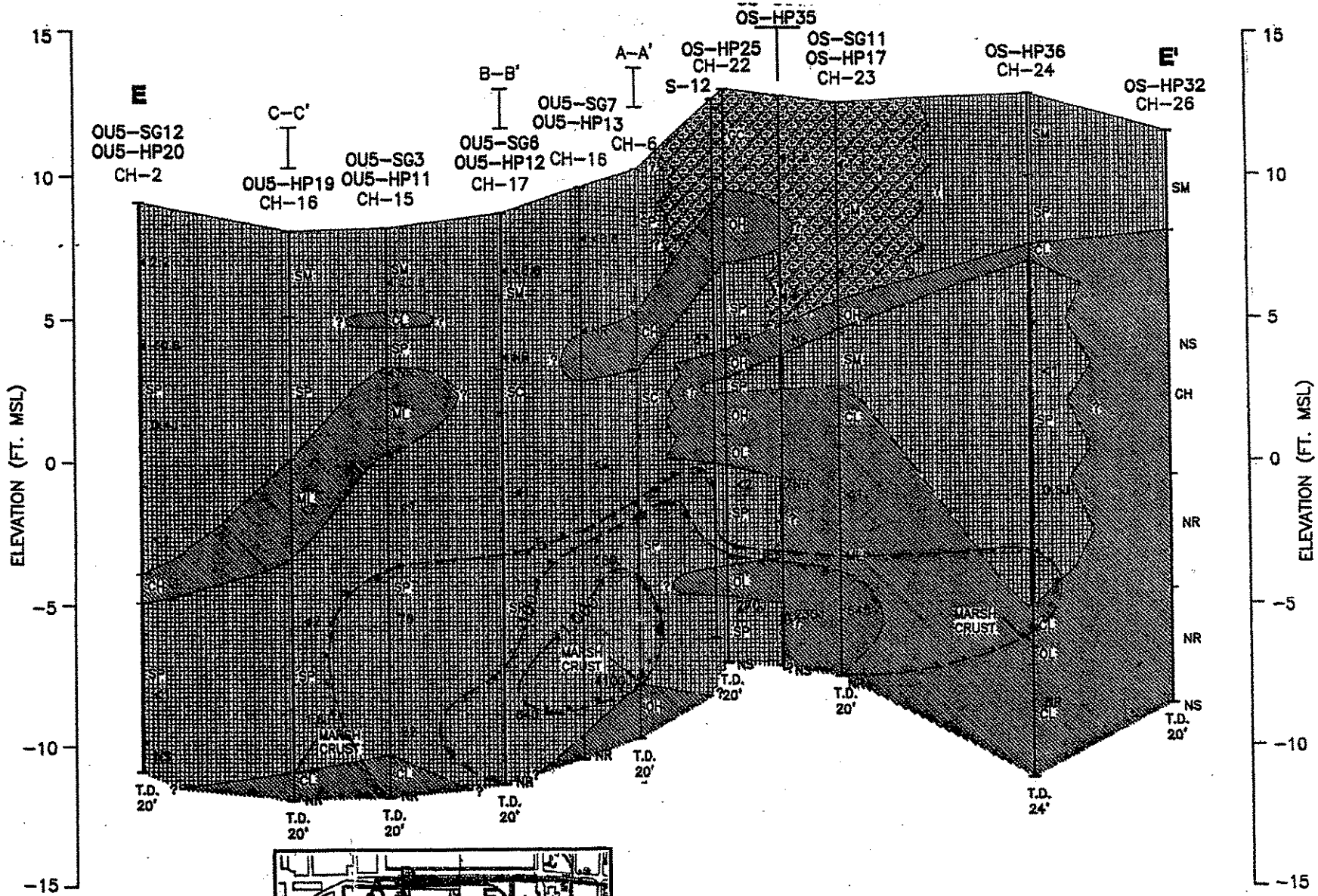
0 300 600 FEET

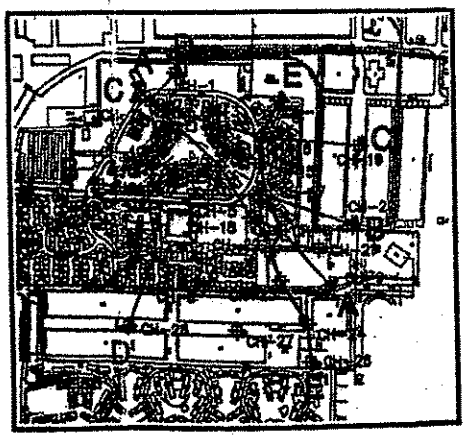
VERTICAL SCALE

0 5 10 FEET

(VERTICAL EXAGGERATION = 60x)

FIGURE-5





INSET

HORIZONTAL SCALE

0 300 600 FEET

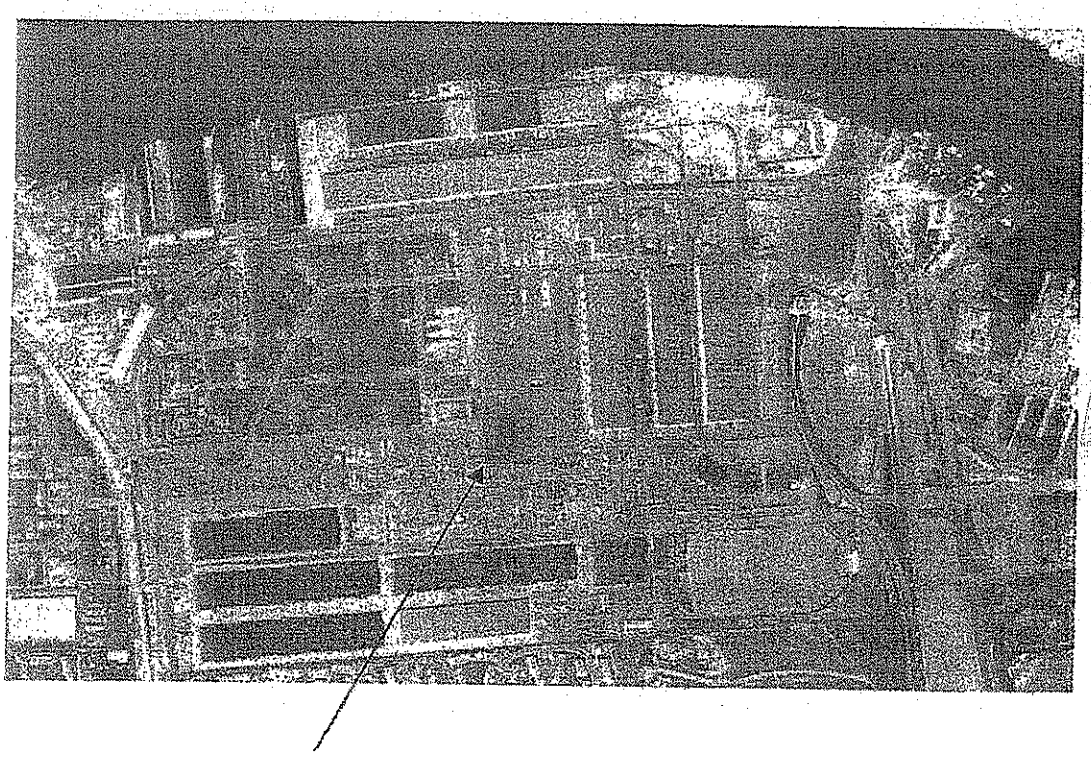
VERTICAL SCALE

0 5 10 FEET

(VERTICAL EXAGGERATION = 60x)

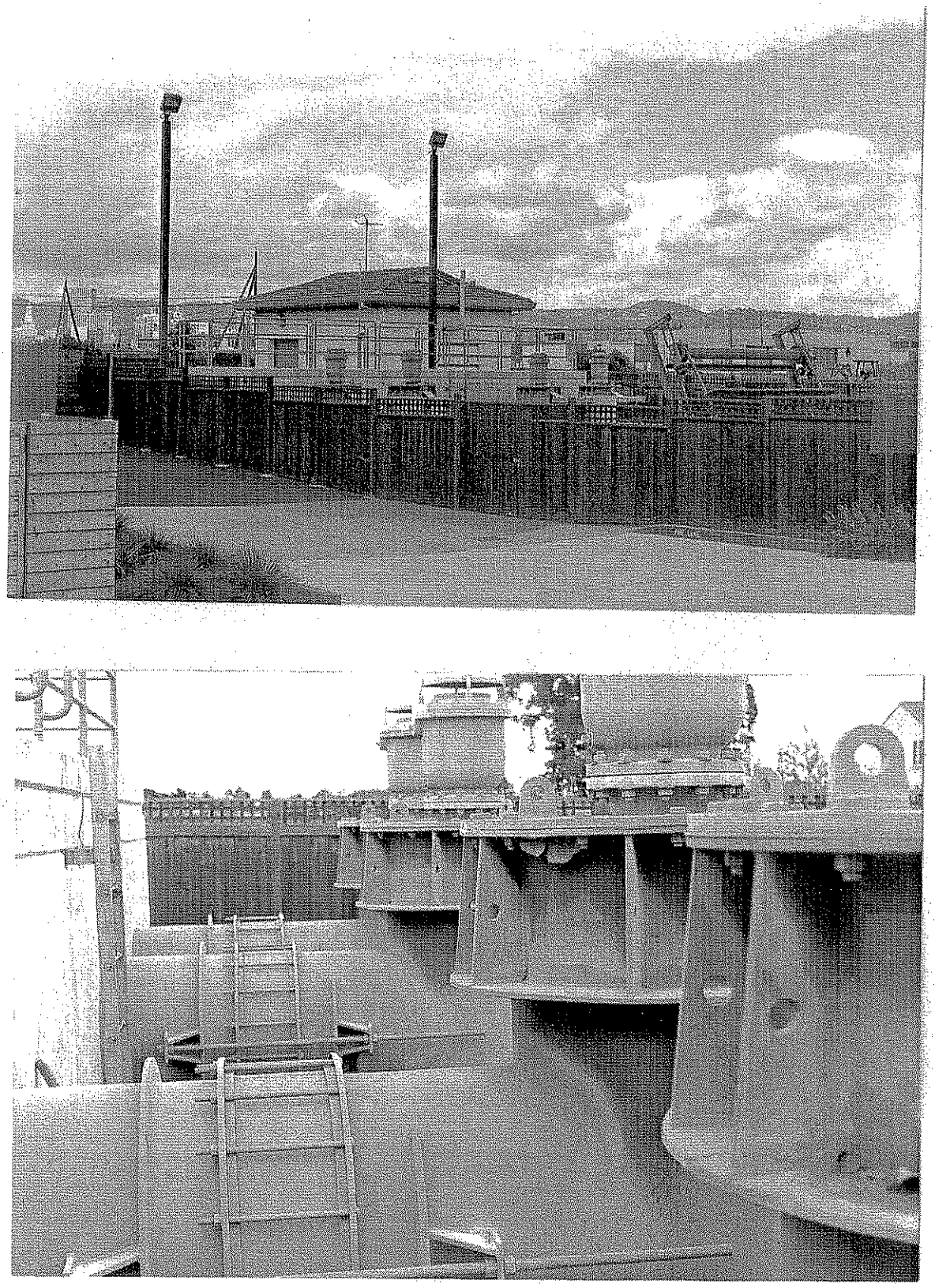
FIGURE-6

1968 Aerial Photograph Depicting Stain



"Stained" Area

FIGURE-7



STORM WATER PUMP STATION NEXT TO SHINSEI GARDENS APARTMENTS - APRIL 2010

FIGURE-8

SOURCE : NAVY PROPOSED PLAN
ON FISCA APRIL 2002

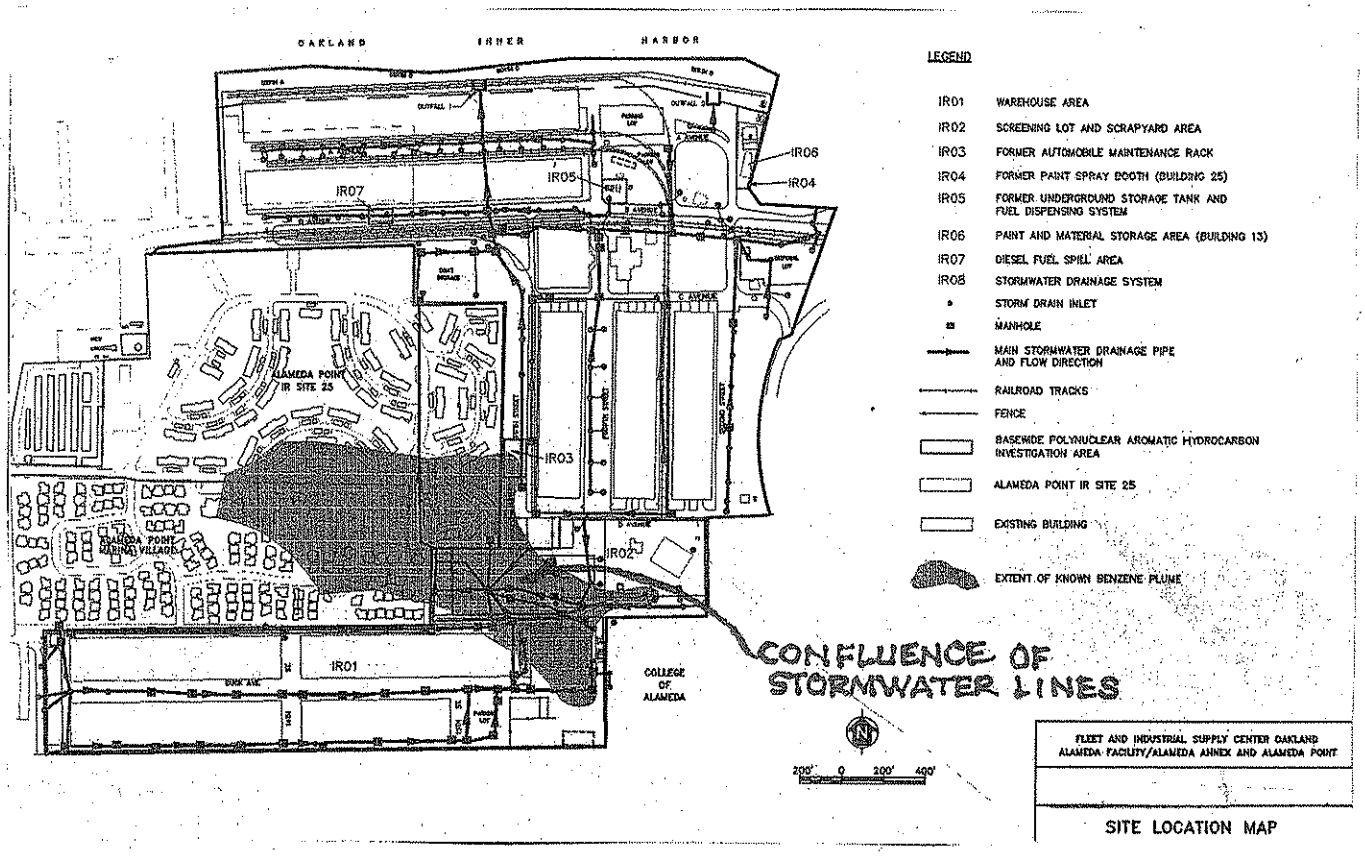


FIGURE-9