NAVAL AIR STATION (NAS) ALAMEDA RESTORATION ADVISORY BOARD MEETING SUMMARY

NAS Alameda Bachelor Officers Quarters
NAS Alameda, California

Tuesday, December 5, 1995

ATTENDEES

See attached list.

MEETING SUMMARY

I. Introduction/Minutes

The meeting was called to order at 7:07 p.m.

Ken O'Donoghue, the community co-chair, opened the meeting and asked whether any restoration advisory board (RAB) members had comments on the November RAB meeting minutes. The following revisions were requested:

- Malcolm Mooney requested the following changes: Page 1, change "sinc" to "sync." Page 8, reflect that AEG has decided to move to Pittsburg, California, not out of state. Page 3, change "Environmental" in "EFA" to "Engineering."

- Tom Lanphar requested the following changes: Page 4, correct the spelling of "accumulate." Page 4, the response should indicate that to prevent contaminated water from entering the San Francisco Bay, a vacuum truck will collect all water used in the Site 18 removal action. Page 5, indicate that closure requirements are handled under the Resource Conservation and Recovery Act (RCRA), not the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Change references to "Mr." Bill Smith to "Dr." Smith.

- Heidi Gitterman requested the following changes: Page 8, change Roman numeral IV to IX. Page 8, revise bullet item to make clear that Karen Hack requested an outline of the Navy's 1996 budget request, as opposed to the funds allocated which is a separate item.

Mr. O'Donoghue moved to approve the November RAB meeting minutes pending the above revisions. RAB members approved Mr. O'Donughue's motion.

Lieutenant Commander (LCDR) Mike Petouhoff introduced Susan Ellis from the California Department of Fish and Game's Base Realignment and Closure (BRAC) unit, in Monterey, California; she has been assigned to NAS Alameda.

II. Co-Chair Announcements

Mr. O'Donoghue announced that Dr. Bill Smith has been with the RAB since its formation and will now be working with the Berkeley Environmental Restoration Center (BERC). Mr. O'Donoghue stated that this is an opportunity to enhance communication between BERC and the Navy and to actively bring academia further into the process to address some of the challenges in cleaning up NAS Alameda.

Mr. O'Donoghue announced that the December midterm focus group meeting will be held December 12, at 7:00 p.m. in the RAB library in Building 1, NAS Alameda. The purpose of the meeting is to discuss action items for January and the new year.

III. Action Item Update

At the November 7 RAB meeting, Ms. Hack requested an outline of the activities for which funding was originally requested in the 1996 budget and the funding that was eventually awarded. In response to Ms. Hack's request, LCDR Petouhoff presented the budget update summarized below.

Projects funded at the end of fiscal year (FY) 1995 are as follows:

- Removal action of storm drains (Site 18)
- University of California at Berkeley (UCB) bioremediation project
- Ecological risk assessment follow-on work

Project funding just approved for fiscal year 1996 is for the following:

- Completion of the Site 18 removal action
- Site 16 removal action
- UCB Seaplane Lagoon and landfill sediments work
- Radiological and other incidental Installation Restoration (IR) work
- Completion of the basewide environmental baseline study (EBS)
- Air permit transfers and other compliance activities

The following project has been shelved pending additional funding in FY 1996:

- Additional sampling for sediments

Projects pending funding in FY 1997 are as follows:

- Sites 7A, 7C, and 14 removal actions
- Treatability studies and removal actions to be determined at various sites

LCDR Petouhoff provided Ms. Hack with a hard copy of his report.

Following LCDR Petouhoff's presentation, RAB members raised several questions and comments. Ms. Hack asked whether additional sampling was included in the ecological follow-on work funded for 1995. LCDR Petouhoff explained that initial assessments are first necessary to determine the appropriate next steps. Doug DeHaan pointed out that the NAS Alameda budget funded for fiscal year 1996 does not reflect the full amount originally requested by the Navy. LCDR Petouhoff stated that although all monies requested in 1996 were not awarded, he anticipates fuller funding in 1997. He stated that it is recognized that BRAC III installations have received less funding than BRAC I and II installations; as a result, 1997 funding should be more complete.

LCDR Petouhoff announced that the agenda for 1996 RAB meetings is being developed and requested that anyone with agenda items call Hans Petersen at the NAS Alameda Environmental Office. A draft list of proposed agenda items was distributed to the RAB (see List of Handouts).

Ardella Daley stated that, considering that the community reuse plan should be finalized by the end of January, she would like discussion of the plan to be included as a future agenda item. LCDR Petouhoff responded that it will be included on the February agenda.

Mr. Lanphar responded to Ms. Hacks' request for copies of any approved portions of the Federal Facilities Site Remediation Agreement (FFSRA). Mr. Lanphar explained that the FFSRA represents a contract between the State and the Navy, and no sections are final. As a result, no sections can yet be made available to the public.

IV. Focus Group Update

TECHNOLOGY FOCUS GROUP

Dr. Smith deferred to Tom Okey for discussion of this topic, as the Technology Focus Group and the Natural Resources Focus Group will hold a joint meeting.

NATURAL RESOURCES FOCUS GROUP

Mr. Okey stated that the Natural Resources Focus Group will hold a joint meeting with the Technology Focus Group on December 19, 1995, at 7:00 p.m. in the RAB Library, Building 1, NAS Alameda. He stated that Dr. June Mire of Environmental Management, Inc., (PRC), and BERC representatives will attend the meeting to answer questions regarding the ecological risk assessment underway at NAS Alameda (which also will be the subject of a presentation at tonight's RAB meeting). He stated the meeting is not limited to RAB members, and anyone interested in attending is welcome. Mr. Okey also thanked LCDR Petouhoff and Mr. Lanphar for their informative presentation at the Audubon Society Workshop held at NAS Alameda on November 9.

REUSE FOCUS GROUP

Ron Basarich stated that the Reuse Focus Group has no update to present.

OUTREACH FOCUS GROUP

Karin King stated that the Outreach Focus Group has no update other than Ms. King is finishing the article she has been writing on the NAS Alameda RAB.

ORGANIZATIONAL FOCUS GROUP

Lyn Stirewalt reported that she met with LCDR Petouhoff and Mr. O'Donoghue to finalize the RAB charter; she expects the charter to be available by the next RAB meeting. Ms. Stirewalt stated that she will pass out another proposed version of business cards for RAB member review and comment.

V. "Protecting the Waterfront" Video

LCDR Petouhoff introduced a video produced by Mr. Petersen outlining the programs that have been implemented at NAS Alameda to protect the San Francisco Bay and the NAS Alameda waterfront. Activities outlined in the video include:

- Bilge water treatment plant: This system treats oily water that collects in the bilge of a ship
- Site 18 removal action: The NAS Alameda storm drain system is being cleaned to remove contaminated sediments that have accumulated in catch drain basins
- Storm water runoff treatment system: Rainwater that may collect contaminants as it flows into drains is treated before being released in the bay

- Education of workers on proper waste maintenance and disposal practices
- Professor Jim Hunt of UCB discussing the importance of sediment studies in the Navy's IR Program.

VI. Ecological Assessment

AQUATIC RISK ASSESSMENT

LCDR Petouhoff introduced Dr. Mire who made a presentation on the Aquatic Risk Assessment at NAS Alameda (see List of Handouts). Dr. Mire opened her presentation by highlighting the goals of ecological assessment:

- Evaluate exposure to plants and animals
- Assess effects on plants and animals
- Determine risks to plants and animals
- Recommend a risk reduction strategy

Dr. Mire explained the traditional process, in which characterization of risk takes precedence over cleanup. She explained that the traditional approach to risk assessment is a phased approach that relies on extensive studies to quantify risks. To reduce uncertainty, studies are phased over a long period of time, prolonging the time before cleanup is initiated. Dr. Mire stated that the traditional phased approach is slow, expensive, and focused on characterization rather than remediation.

As a result, NAS Alameda is implementing the U.S. Environmental Protection Agency's (EPA) Superfund Accelerated Cleanup Model (SACM) approach to ecological assessments, referred to as the "common sense approach." SACM focuses directly on sites known to pose the greatest risk to human health and the environment. Dr. Mire explained that this approach directs funds for early cleanup of sites known to pose a risk, and eliminates unnecessary studies. She added that the SACM focuses on presumptive remediation alternatives that are already established.

Dr. Mire explained that the screening process used in SACM is being established by the Biological Technical Assistance Group (BTAG). The BTAG is an interagency group working collaboratively to address environmental problems in the San Francisco Bay. The agencies represented in the BTAG include the U.S. EPA, U.S. Fish and Wildlife Service, California EPA, Regional Water Quality Control Board (RWQCB), and the National Oceanic and Atmospheric Administration. Under SACM, using BTAG-approved screening criteria, sites will be assigned to one of three groups:

- Definite or immediate risk (HOT)
- Little or no risk (COLD)
- Not hot, but otherwise uncertain (GRAY)

Dr. Mire explained that by using this screening approach, the sites known to present a risk will be immediately targeted for cleanup. "Gray" sites will be further assessed to determine appropriate action. This approach will prevent limitless study that can exhaust funds, prolong the cleanup process, increase the potential risk and continued exposure to plants and animals, and allow contaminant migration.

Dr. Mire then gave an overview of the regional approach to ecological assessment of contaminated sediments in the bay. Dr. Mire explained that because there has been industrial activity in the San Francisco Bay Area for more than 100 years, resulting in bay sediment contamination, it is essential that the problems of sediment and fish contamination be addressed regionally. Dr. Mire explained that if NAS Alameda cleaned all the sediments surrounding the base without working regionally, such cleanup could be in vain because sediments from the rest of the bay could, in some places, migrate into the cleaned area and thwart cleanup efforts. The regional assessment now being established by the BTAG includes the following elements:

- Developing sediment screening values. Because bay area sediments are contaminated from many sources from more than 100 years of industrial activity, it is necessary to develop sediment screening values for the entire bay.

- Developing a database of toxicological effects of contaminants on native species common to Navy installations; this will help streamline resources and prevent duplicative efforts

- Developing regional ecological exposure models for animals of concern at Navy installations; this will also help to streamline resources and prevent duplicative efforts

- Developing guidelines for conducting feasibility studies at "hot" sites and validating status of "cold" sites

Dr. Mire gave an example of an exposure assessment using the least tern. To determine whether the least tern is at risk from contaminated sediments at NAS Alameda, the following approach will be used:

- Review least tern foraging data on prey species. Because the least terns have been studied for so long, there is a significant amount of information that can be evaluated.

- Evaluate exposure of those prey species to contaminated sediment; in other words, determine if the fish eaten by the least terns are exposed to contaminated sediments

- If exposure of prey fishes to contaminants is thought to be significant, measure

contaminant levels in prey species caught in the area. Measurement includes testing fish tissues in prey species.

- Develop a model for determining contaminant transfer to least terns, if necessary

- Characterize the risk to least terns

Dr. Mire explained that this particular approach proceeds from the "top" down, because the least tern is an endangered species. This process will entail first assessing the fish eaten by the least terns. If they are found to be affected by contaminants, the prey of these fish may be assessed depending on the foraging and migratory behavior of the prey fishes. On the other hand, exposure assessments for nonendangered animals is conducted from the "bottom" up. Sediments will be analyzed, and if necessary, tissues of resident animals will be analyzed for contaminants. Transfer of contaminants from prey to predator will be estimated based on standard toxicological methods. Exposure assessments at NAS Alameda will include the following animals:

- Wading birds
- Shorebirds
- Ducks and geese
- Raptors
- Small animals

Dr. Mire closed her presentation by encouraging RAB members to comment on future ecological assessment work. For example, the RAB may provide input during presentations of the ecological assessment results, expected mid-1996, as well as review reports summarizing the ecological assessment in mid- to late 1996.

TERRESTRIAL RISK ASSESSMENT

Dr. Mire introduced Steve Clark (PRC), who gave a presentation on terrestrial risk assessment at NAS Alameda. Mr. Clark first explained what has been accomplished to date in the terrestrial risk assessment:

- Identification of habitats and receptors: the process of identifying which habitats, plants, and animals may be harmed by chemical release

- Threatened and endangered species survey: reviewing literature from organizations such as U.S. Fish and Wildlife Service, California Department of Fish and Game, and Bay Area nonprofit organizations. No threatened or endangered species were found during the vegetation survey or the Salt Marsh Harvest Mouse survey.

Mr. Clark then described habitats that exist at NAS Alameda (see List of Handouts). He

presented a habitat map and several slides of terrestrial habitats. Mr. Clark explained that dense pickleweed at NAS Alameda is the preferred habitat of the Salt Marsh Harvest Mouse. To determine whether the harvest mouse was residing at NAS Alameda, a total of 300 traps were set for 8 days in the West Beach Landfill Wetland and in the Runway Area Wetland. No harvest mice were caught at NAS Alameda.

Mr. Clark outlined what remains to be accomplished in the terrestrial risk assessment:

- Identify contaminants of potential concern. This process will be based on chemical data, background information, and ecological screening values.
- Identify complete exposure pathways. This process identifies routes by which a species can be exposed to chemicals.
- Identify sites requiring cleanup to protect receptors
- Identify sites requiring no further action

WATERFRONT: LAGOON AND LANDFILL SEDIMENTS

LCDR Petouhoff introduced Dr. Smith from BERC's Allied Technology Group (ATG). Dr. Smith gave an overview of the organization of the BERC office and his position (see List of Handouts). Dr. Smith continued with an explanation of BERC's participation in assessing sediment contamination in the Seaplane Lagoon and the West Beach Landfill Wetland sites. He stated that the process is in the early stages, and ATG is soliciting public comment on the process.

Dr. Smith gave an overview of the program, which is primarily focussed on metals because BERC has strong expertise in metals. He explained that sediment assessment will include identifying toxins, determining how metals reach plants and animals, and determining how toxins affect the ecosystem.

Dr. Smith explained that sediments are sampled at different depths. Contaminated surface sediments are considered to pose an immediate hazard; core sediments beneath the surface may become a hazard if disturbed. Dr. Smith stated that BERC will be conducting bulk sediment and pore water toxicity tests. Toxicity identification evaluations (TIE) will be conducted to determine the nature of the toxic sediments. These tests will help determine whether and how metals reach various plants and animals. He also noted that the actual impact of toxins in the sediments will depend on site-specific conditions.

ATG will also be coordinating bioaccumulation studies using clams in 28-day exposure tests, and extraction with marine worm digestive fluids. Finally, Dr. Smith presented the following potential remedial alternatives:

- Seaplane Lagoon: institutional controls, dredging and capping in place, or dredging and upland disposal

- Landfill: institutional controls, partial excavation and installation of reactive perimeter wall, or excavation, dredging, and upland disposal

Dr. Smith stated that when considering remedial alternatives, it is important to consider whether a remedial action might actually exacerbate the situation. As an example, he explained that dredging underwater sediments, as in the Seaplane Lagoon, might disturb contaminants in such a way as to cause more serious risk to plants and animals, while capping the lagoon would minimize disruption of contaminated sediments and perhaps better protect plants and animals.

VII. Ecological Discussion: Questions and Answers

LCDR Petouhoff invited all three presenters, Dr. Mire, Mr. Clark, and Dr. Smith, to field questions from RAB members and the public. The following questions were discussed.

- Mr. Mooney asked Mr. Clark if no further action will be recommended at sites where contamination is known to be present but no complete exposure pathway is determined to exist. He further asked what steps will be taken in the event that complete exposure pathways are identified in the future. Mr. Clark stated that the terrestrial risk assessment report will provided enough information to identify situations where potential risks to plants and animals would exist if the future conditions should change.

- Mr. DeHaan asked Dr. Smith about the schedule of BERC activities. Dr. Smith responded that the workplan has not been completed; he estimates 6 to 9 months to complete the studies, and stated that the total process will probably take about 3 to 4 years. Dr. Mire added that the schedule of activity will depend on what component of the work is being discussed. She explained that regional criteria needed for the ecological risk assessment will not be available for 6 months. LCDR Petouhoff added that schedules will be updated in the NAS Alameda BRAC Cleanup Plan (BCP). He further noted that reuse timelines are shorter than cleanup schedules, and therefore, interim reuse opportunities will be made available.

- Mr. Okey referred to an earlier comment made by Dr. Mire that regional sediment screening criteria will be established based on the whole Bay Area as a reference site. He said that he was uncomfortable with the approach and asked why the San Francisco Bay is being used as the reference point for establishing the criteria. Dr. Mire responded that surrounding regional (ambient) conditions must be established to determine to what degree sediments should be cleaned. If NAS Alameda were to clean the sediments beyond existing ambient conditions, the area would

probably become contaminated again because of the surrounding conditions. Mr. Okey asked how ambient conditions will be determined. Dr. Mire explained that the criteria are being established using data collected by the RWQCB at sampling sites throughout the bay, and not from areas known to be contaminated by Navy installations or current industry.

- Ms. Stirewalt asked if the BTAG meetings are open to the public. Jim Haas of the U.S. Fish and Wildlife Service explained that the BTAG is an ad hoc interagency group, made up of regulators and natural resource trustees; the Navy is not a participant. The BTAG is sponsored by the EPA to address biological issues at cleanup sites. LCDR Petouhoff stated that the BRAC Cleanup Team (BCT) is in regular contact with the BTAG, and as a member of the BTAG, Mr. Haas can make presentations on the screening criteria as they are developed. Mr. Haas stated that when screening criteria are being established, there will be a public review process directed by RWQCB.

- Ms. Stirewalt asked Dr. Mire if fish toxicity will be evaluated. Dr. Mire answered that only small resident fish will be evaluated. LCDR Petouhoff stated that it is known that fish in San Francisco Bay are contaminated and they should not be eaten, whether they are caught at NAS Alameda or the Berkeley pier. The Navy wants to inform people about the problem and is posting signs, at NAS Alameda written in four languages, warning that fish caught in the bay should not be eaten.

- Mr. Okey asked if there are resident fish that are appropriate for ecological assessment evaluation. Dr. Mire stated that resident fish will be evaluated if there is a logical link between the sediments, invertebrates, and the fish. She reiterated that although the least tern assessment proceeds from the top down, generally assessments are conducted from the bottom up, so that first the determination is made whether sediments are contaminated. If sediments are contaminated, the effects or invertebrates are assessed; if the invertebrates are contaminated, the resident fish will be evaluated.

  Mr. Okey then explained that Conservation Science, which he represents, has received a small grant to do food web modeling on the transport of seven contaminants. The modeling will be based on existing data collected from various sources. Mr. Okey stated that this is the first time such modeling has been done for the San Francisco Bay.

- Dr. Smith asked Dr. Mire about the pilot fish study. Dr. Mire responded that the study indicates that fish caught at NAS Alameda do not pose a greater risk than fish caught anywhere else in the San Francisco Bay.

VIII. Closing Remarks

Mr. O'Donoghue stated that the RAB members and the public should not be intimidated by technical language, and questions will be answered in accessible language at the focus group on December 19.

Mr. O'Donoghue thanked the presenters and advised that the questions would continue at the joint Natural Resources and Technology Focus Group meeting on December 19. He said that anyone interested in attending the focus group should call Teresa Bernhard at (415) 244-2596. He stated that if no one calls to indicate that they will attend the focus group meeting, it will be canceled.

The meeting was adjourned at 9:47 p.m.

IX. Action Items

- PRC will produce copies of the ecological posters presented at the December RAB meeting and provide the copies to NAS Alameda for distribution to the RAB.
- The Navy will make the SACM available in the RAB library.
- Mr. Haas will provide a presentation to the RAB on the regional sediment screening criteria once they are developed by the BTAG.

The next meeting will be held at 7:00 p.m. on Tuesday, January 9, 1996, at the Bachelor Officers Quarters, NAS Alameda.

NAVAL AIR STATION (NAS) ALAMEDA RESTORATION ADVISORY BOARD
MEETING SUMMARY
LIST OF HANDOUTS

NAS Alameda Bachelor Officers Quarters
NAS Alameda, California

Tuesday, December 5, 1995

- **Proposed RAB Agendas for 1996**
  Distributed by LCDR Petouhoff

- **Terrestrial Ecological Risk Assessment**
  Distributed by Mr. Steve Clark

- **NAS Alameda Ecological Assessment**
  Distributed by Dr. June Mire

- **Berkeley Environmental Restoration Center: Seaplane Lagoon and West Beach Landfill Wetlands**
  Distributed by Dr. Bill Smith

DRAFT
Naval Air Station, Alameda
Restoration Advisory Board
Agenda
December 5, 1995

Time	Subject	Presenter
7:00-7:10	Introductions and Minutes	RAB
7:10-7:15	Co-Chair Announcements	Co-Chairs
7:15-7:20	Action Items Update	RAB
7:20-7:25	Focus Group Announcements	FG Chairs
7:25-7:35	"Protecting the Waterfront" Video	Environmental Office
7:35-8:00	Ecological Assessment	
	-Aquatic Risk Assessment Dr. Mire will discuss the ecological assessment of aquatic areas at NAS Alameda, which include the Western Bayside, Oakland Inner Harbor, Seaplane Lagoon, West Beach Landfill Wetland and Runway Wetland.	Dr. June Mire, PRC
8:00-8:10	BREAK	
8:10-8:25	-Terrestrial Risk Assessment Mr. Clark will address how we'll approach ecological issues on the land portions of the base in Operable Units 1, 2 and 3. (The industrial areas and the landfill.)	Mr. Steve Clark
8:25-8:35	Waterfront: Lagoon & Landfill Sediments	Mr. Bill Smith
8:35-8:50	Ecological Discussion: Q & A	Mire, Clark, Smith
8:50-9:00	1996 RAB Agenda Topics	
9:00	Adjourn	

PROPOSED RAB AGENDAS FOR 1996

JANUARY - Status of Cleanup
BRAC Cleanup Plan

EBS Phase IIB Results Summary

FEBRUARY - Background Ambient

MARCH - Risk Assessment
Uncertainties and Assumptions

APRIL - Other Radiological Issues

MAY - Beneficial Re-Use of Groundwater

June -

July -

August -

September -

October

November

December

Terrestrial Ecological Risk Assessment

Steve Clark
PRC Environmental Management, Inc.
Portland, Oregon
phone: 503-227-7516
fax: 503-227-7615

What has been accomplished so far?

- Identification of Habitats
- Identification of Receptors
- Threatened and Endangered Species Survey

Habitat Types at NAS Alameda

Urban/ Ornamental Landscapes

Non-Native Grasslands

Estuarine Intertidal Emergent Wetlands

Ruderal Upland Vegetation

Disturbed Areas

Paved Runway Areas

California Least Tern Sanctuary

Brackish Pools

Beach

Rip Rap

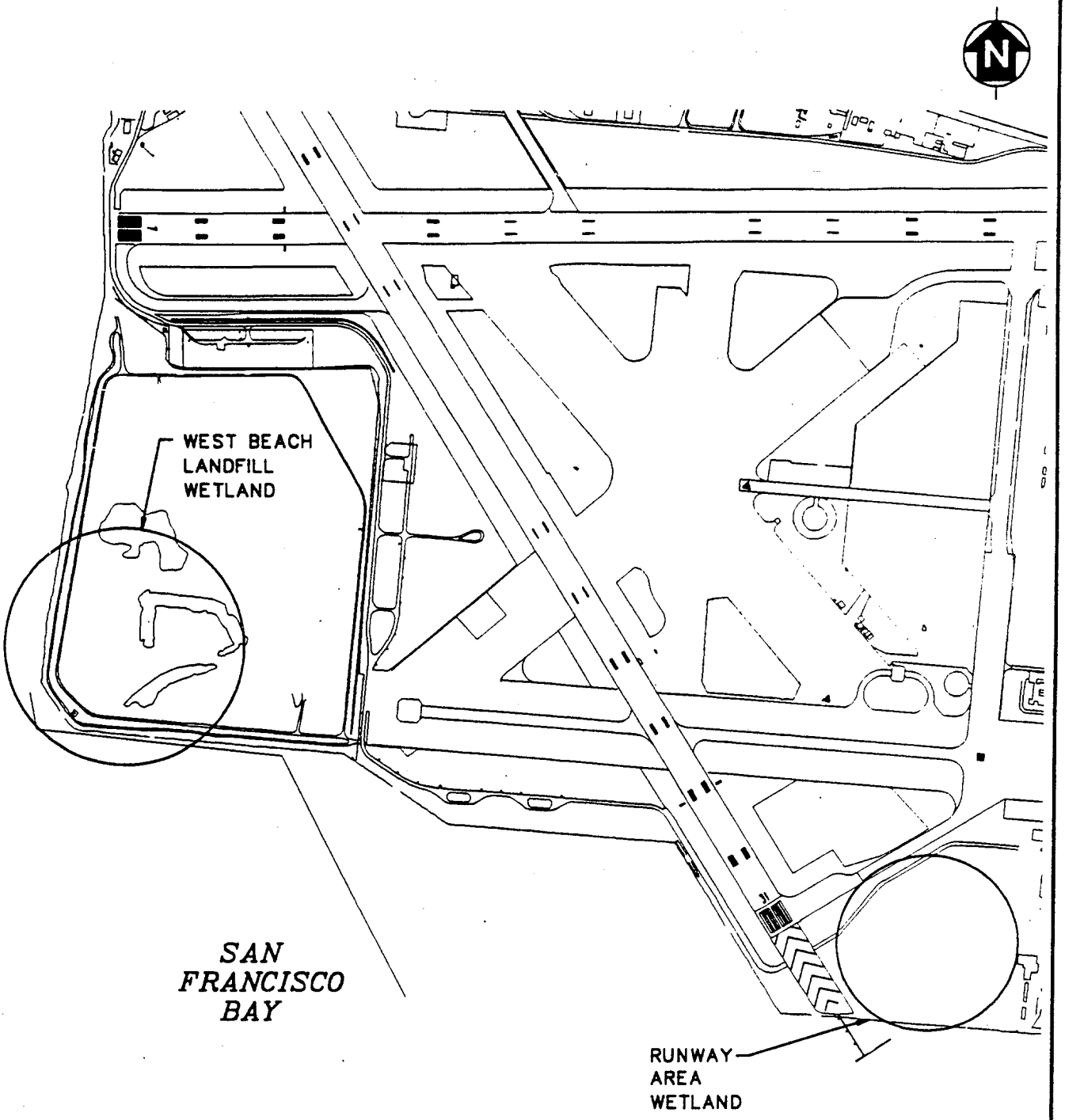
Open Water

HABITAT MAP

(Slide 4)

HABITATS AND SPECIES

(Slides 5 through 10)



500' 0 500' 1000'

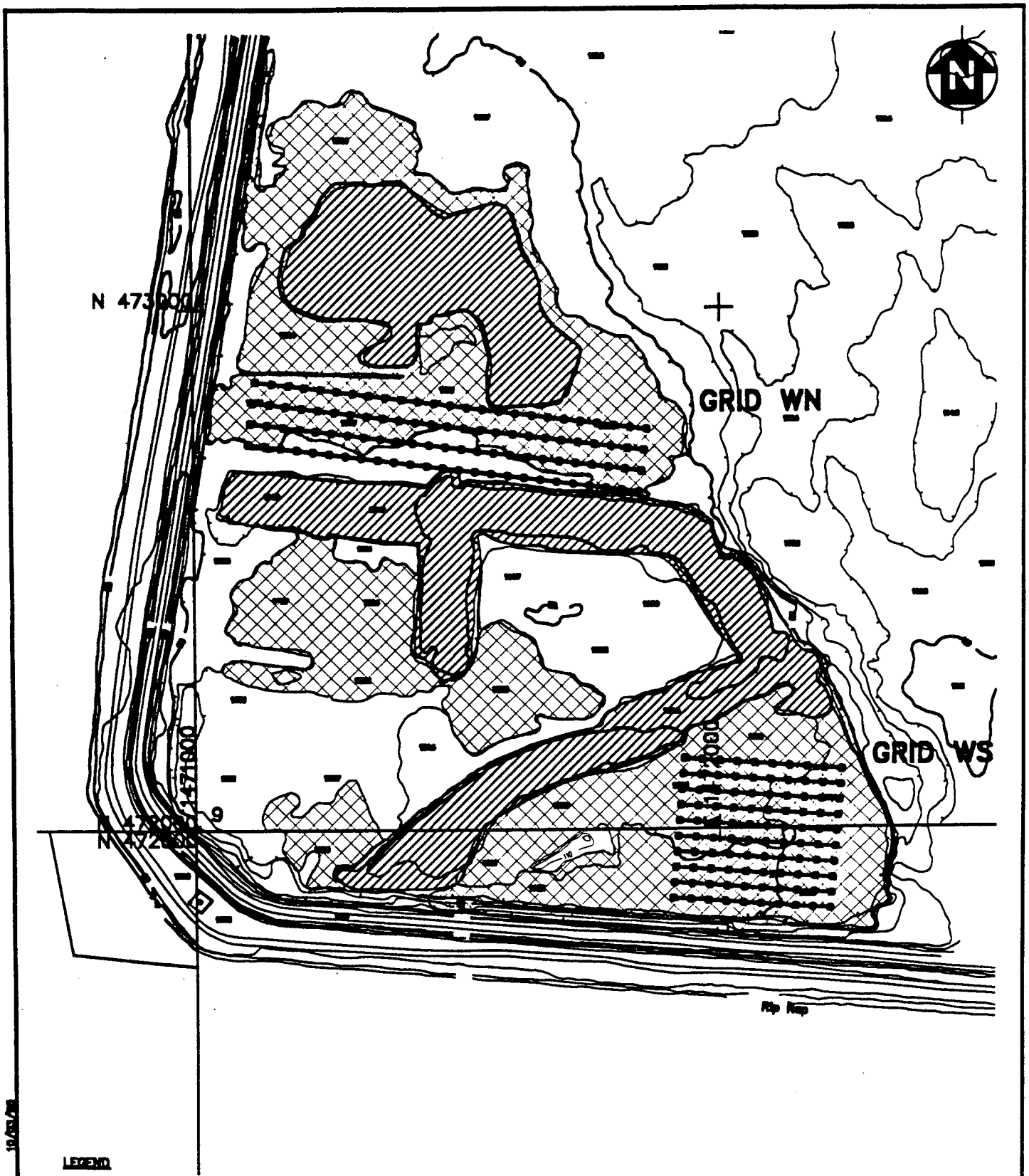
SCALE: 1" = 1000'

NAVAL STATION ALAMEDA
ALAMEDA, CALIFORNIA

FIGURE 1
LOCATION MAP

PRC ENVIRONMENTAL MANAGEMENT, INC.

DATE: 10/12/95 DDJ DNFILE NAME: R:\CAD\0440107\M14\TES\ALALOC.DWG



LEGEND

WEST BEACH LANDFILL WETLAND

OPEN WATER AREA (SEASONAL)

APPROXIMATE TRAP LOCATIONS

WN WEST BEACH LANDFILL WETLAND – NORTH GRID

WS WEST BEACH LANDFILL WETLAND – SOUTH GRID

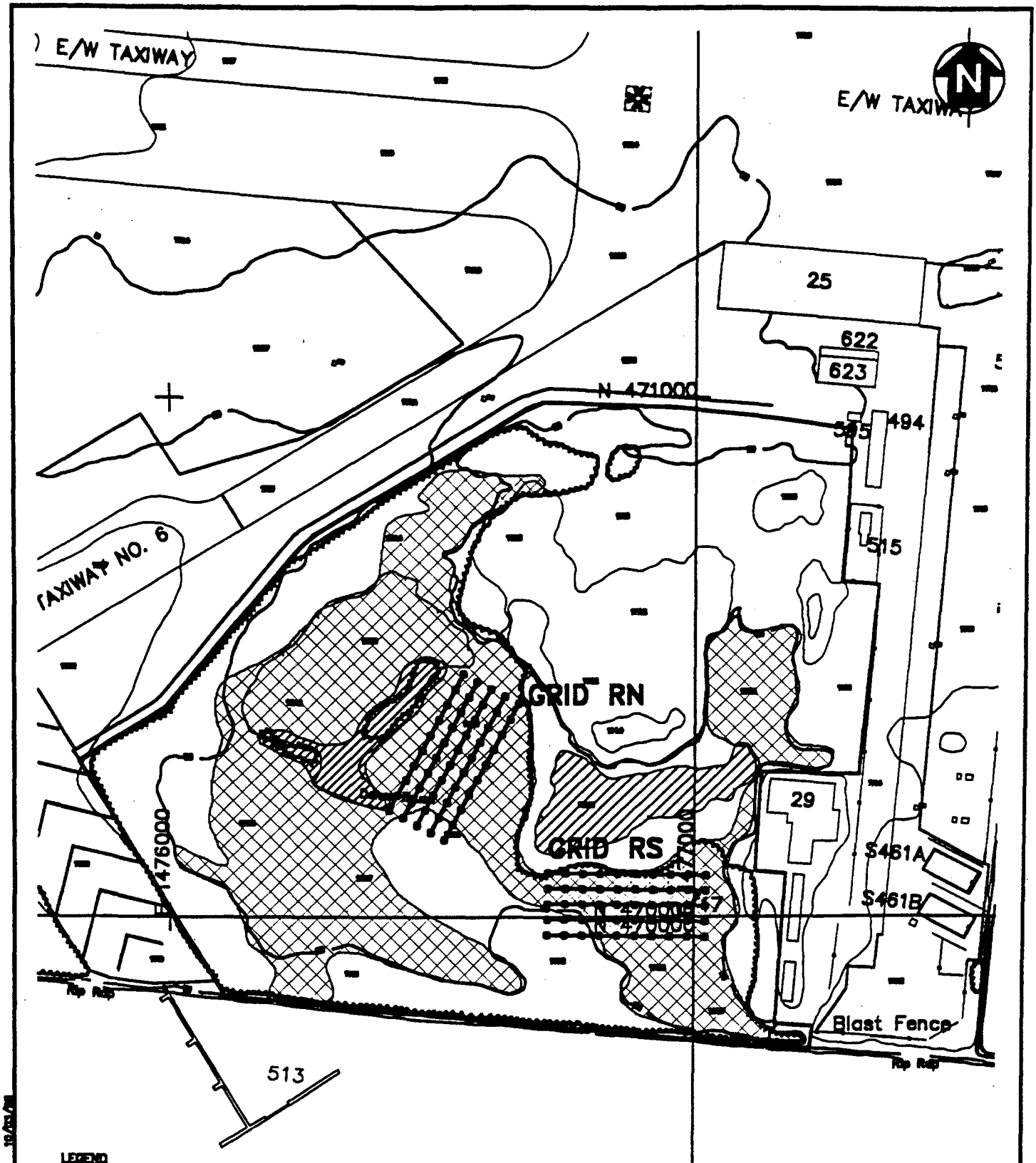
125' 0 125' 250'

SCALE: 1= 250'

NAVAL AIR STATION ALAMEDA
ALAMEDA, CALIFORNIA

FIGURE 2

SALT MARSH HARVEST MOUSE SURVEY GRIDS
WEST BEACH LANDFILL WETLAND



NAVAL AIR STATION ALAMEDA
ALAMEDA, CALIFORNIA

FIGURE 3

SALT MARSH HARVEST MOUSE
SURVEY GRIDS
RUNWAY AREA WETLAND

Summary of Results for Each Grid
Salt Marsh Harvest Mouse Survey
NAS Alameda

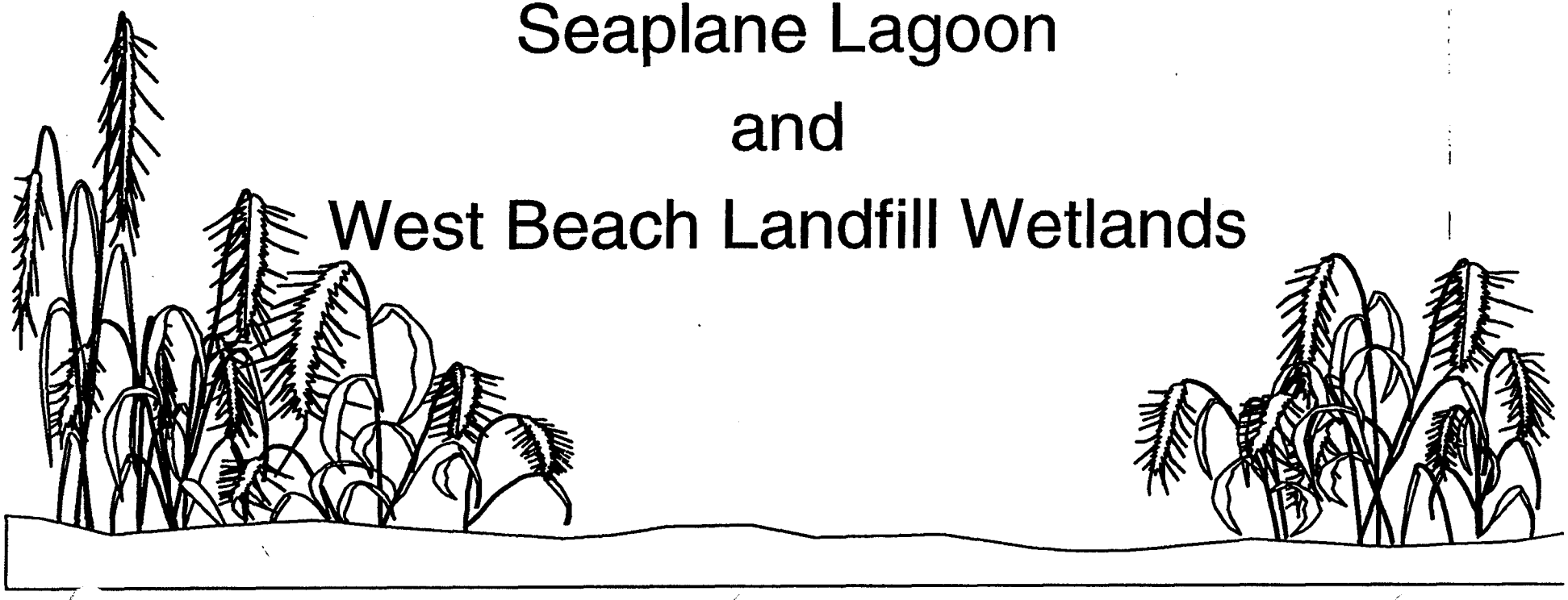
Date	Grid	Species	Number Captured	Closed, Empty Traps	Number of Trap Nights
8/22 - 8/31/95	WN	House mouse *Mus musculus* Black rat *Rattus rattus*	404 1	32	800
8/22 - 8/31/95	WS	House mouse *Mus musculus*	210	107	800
8/22 - 8/31/95	RN	House mouse *Mus musculus*	108	38	397
8/22 - 8/31/95	RS	House mouse *Mus musculus*	63	37	400
TOTAL		House mouse *Mus musculus* Black rat *Rattus rattus*	785 1	214	2,397

What remains to be accomplished in this phase of work?

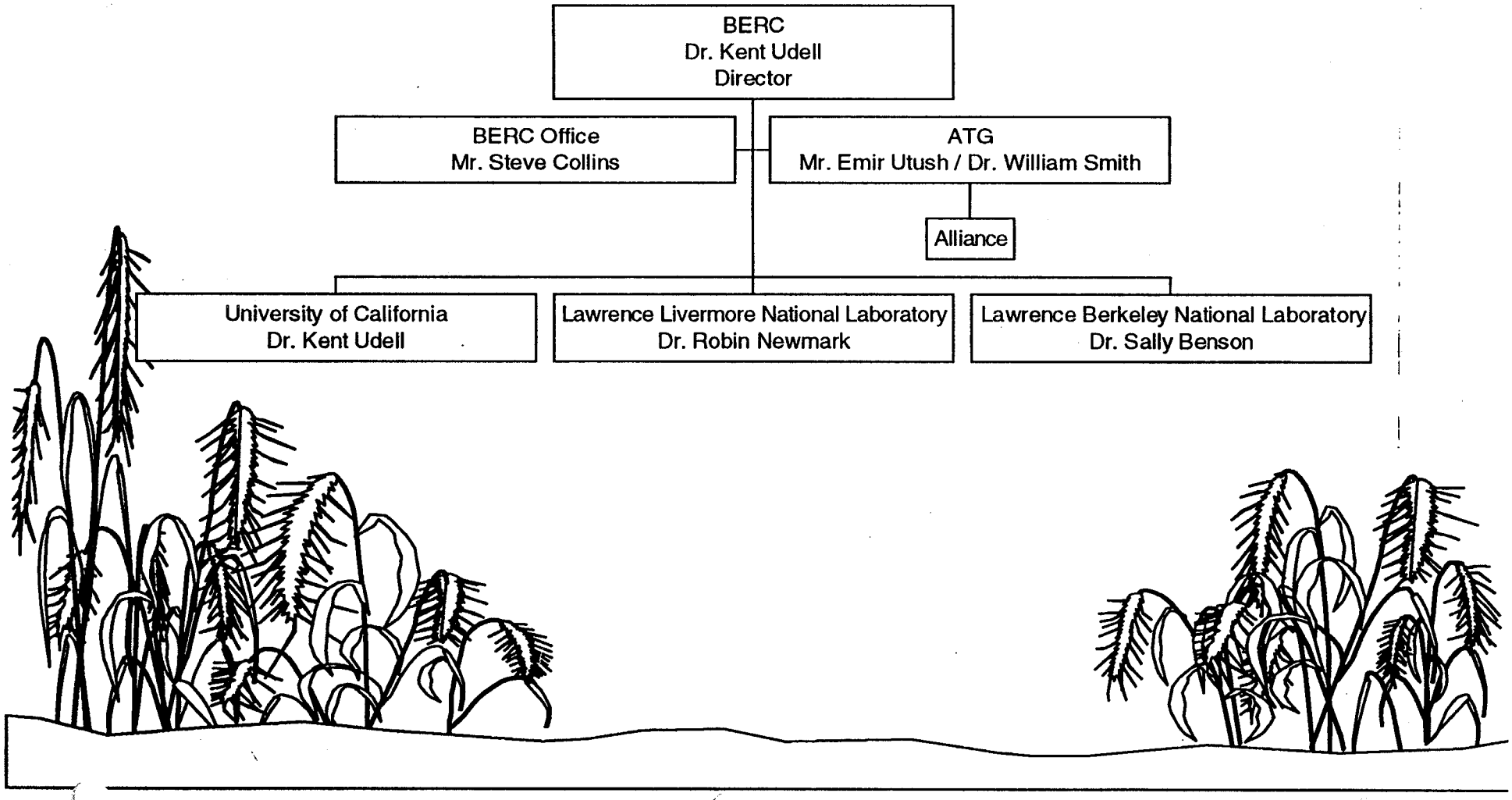
- Identify Contaminants of Potential Concern
- Identify complete exposure pathways
- Identify sites that require no further action
- Identify sites requiring cleanup to protect receptors

Berkeley Environmental Restoration Center

Seaplane Lagoon
and
West Beach Landfill Wetlands

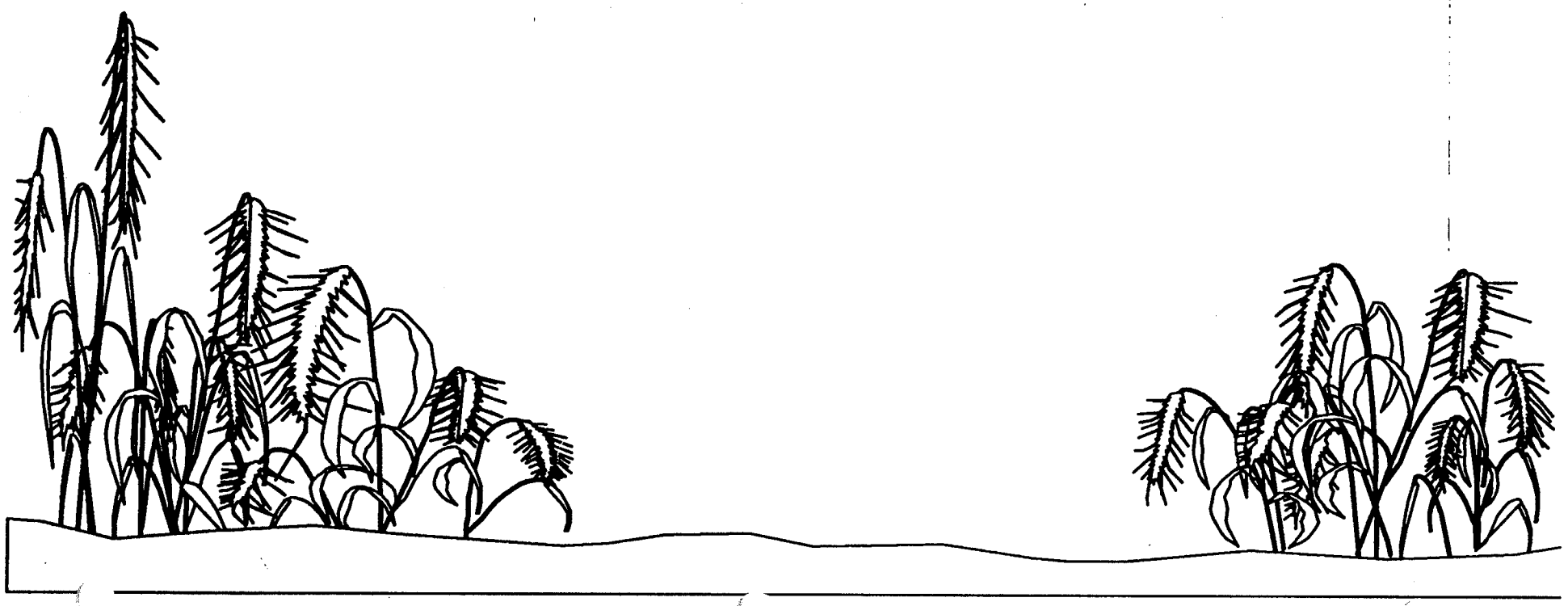


Participating Organizations



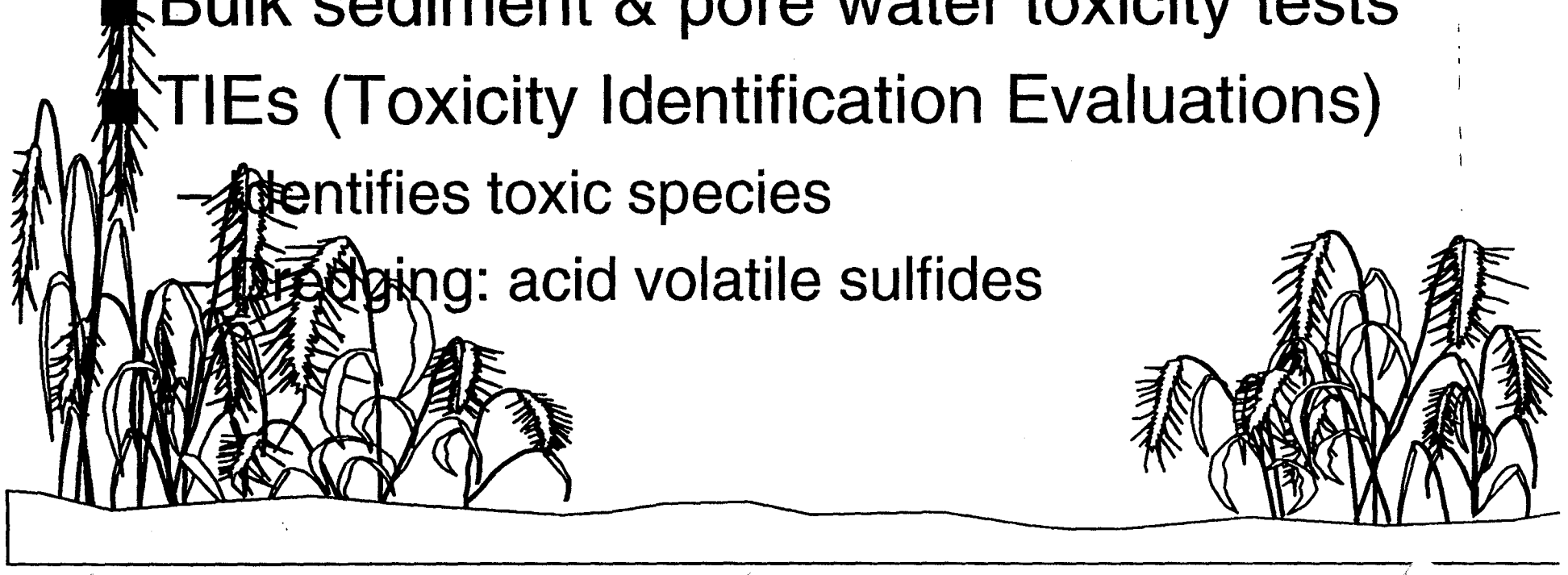
Assessment of Sediments

- What are the Toxins?
- How do Metals Reach Plants and Animals?
- How do Toxins Effect the Ecosystem?



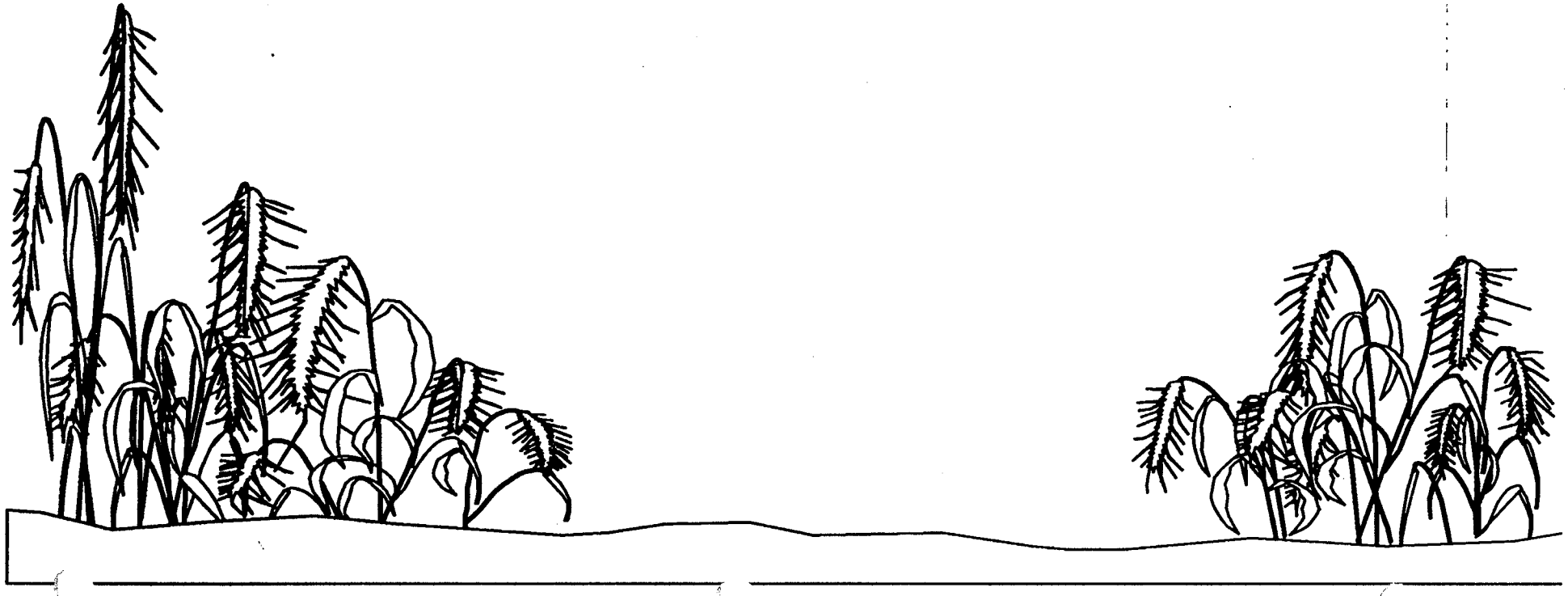
What are the Toxins?

- Sample sediments at different depths
  - Present hazard: surficial sediments
  - Potential hazard: core sediments
- Bulk sediment & pore water toxicity tests
- TIEs (Toxicity Identification Evaluations)
  - Identifies toxic species
  - Dredging: acid volatile sulfides



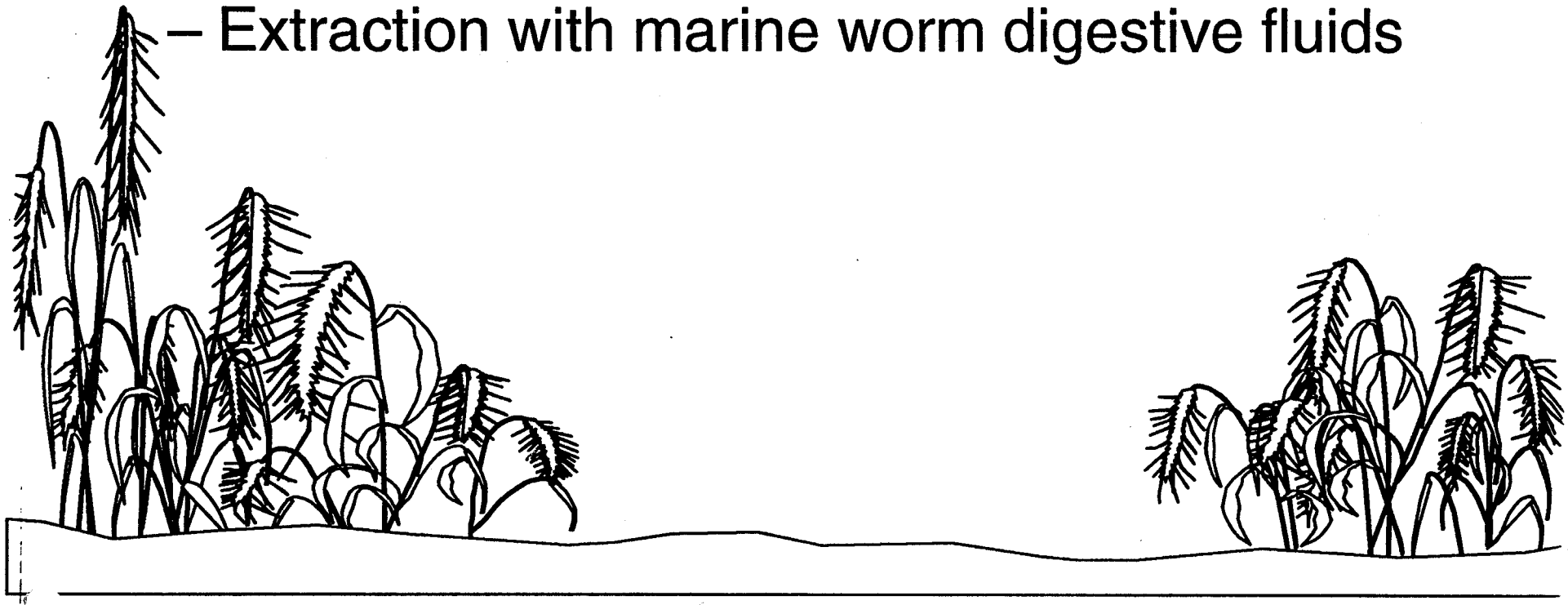
How Do Metals Reach Plants and Animals?

- Speciation in sediments and waters
- Partioning between sediments and waters
- Transport within sediments



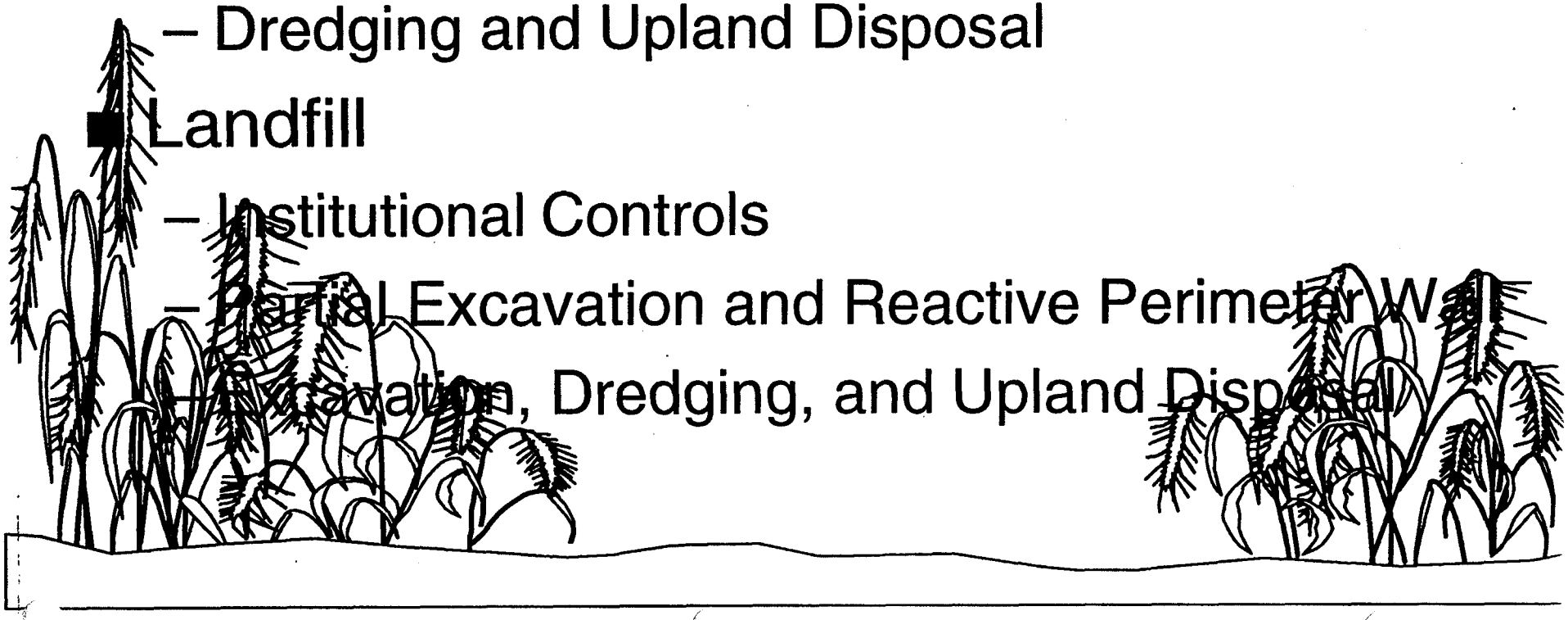
How Do Toxins Effect the Ecosystem

- TIEs (Toxicity Identification Evaluations)
- Bioaccumulation studies
  - Clams (28 day exposure)
  - Extraction with marine worm digestive fluids



Some Remedial Alternatives

- Seaplane Lagoon
  - Institutional Controls
  - Dredging and Capping in Place
  - Dredging and Upland Disposal
- Landfill
  - Institutional Controls
  - Partial Excavation and Reactive Perimeter Wall
  - Excavation, Dredging, and Upland Disposal



ATTACHMENT

ATTENDANCE LIST

RESTORATION ADVISORY BOARD
MEETING SUMMARY - DECEMBER 5, 1995

THE ABOVE IDENTIFIED ATTACHMENT IS NOT AVAILABLE.

EXTENSIVE RESEARCH WAS PERFORMED BY NAVFAC SOUTHWEST TO LOCATE THIS ATTACHMENT. THIS PAGE HAS BEEN INSERTED AS A PLACEHOLDER AND WILL BE REPLACED SHOULD THE MISSING ITEM BE LOCATED.

QUESTIONS MAY BE DIRECTED TO:

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NAVAL FACILITIES ENGINEERING COMMAND
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