NAVAL AIR STATION ALAMEDA RESTORATION ADVISORY BOARD MEETING SUMMARY

NAS Alameda Bachelor Officers Quarters
NAS Alameda, California

Tuesday, March 5, 1996

ATTENDEES

See the 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 February RAB meeting summary. The following revisions were requested.

Malcolm Mooney requested that the Maritime Administration acronym be changed from MERAD to MARAD on page 5; the Roman numerals be corrected on page 5; clarification that the Marina area described in the community reuse plan also includes the shoreline.

II. Co-Chair Announcements

Mr. O'Donoghue made the following announcements.

- The next focus group chair meeting is scheduled for 7 p.m. on Wednesday, March 20, 1996, in the RAB library.
- The charter is still being reviewed and should be completed by April.
- Dr. Bill Smith has resigned from the RAB as a result of his increased responsibilities at the Berkeley Environmental Restoration Center (BERC). To avoid an apparent conflict of interest, tonight will be Dr. Smith's last RAB meeting as a member. Dr. Smith lives in Alameda and as a community member will continue to participate in the focus groups.

Lieutenant Commander Mike Petouhoff made the following announcements.

- Two video cameras are being used to tape the RAB meeting. Segments of the tape will be used in a documentary on the base closure process at NAS Alameda. Video tapes of recent RAB meetings are available for viewing.

- Sherri Withrow will be leaving her position in the environmental office at NAS Alameda. She has accepted a job with the Federal Bureau of Investigation (FBI). LCDR Petouhoff announced that tonight was the last RAB meeting Ms. Withrow will be attending as an NAS Alameda employee. Mr. O'Donoghue thanked Ms. Withrow for her hard work and years of service, and presented her with a certificate of appreciation. Ms. Withrow thanked Mr. O'Donoghue and stated it is the RAB that deserves the thanks, and expressed her appreciation for the work the RAB is doing.

- LCDR Petouhoff announced that he is resigning to take a Navy teaching position at Port Hueneme in southern California. He stated that he is going to miss working with Tom Lanphar and James Ricks, and the last RAB meeting he will attend will be in May. He expects his replacement will be introduced to the RAB at the April RAB meeting.

- The NAS Alameda Environmental Office voice mail system is operational although there were some initial problems.

- The Environmental Impact Statement Scoping Meeting will be held at Alameda High School on March 13, 1996.

- NAS Alameda will be hosting a display and giving presentations at the Lawrence Hall of Science on April 27, 1996, as part of Earth Week activities at UC Berkeley.

- The Emergency Planning and Community Right to Know Act (EPCRA) mandates that locations with toxic chemicals must notify the surrounding community of the inventory of toxic substances to assist them in preparedness plans in the event of an emergency that may result in a release, such as an earthquake. NAS Alameda is on the list of sites required to inventory and disclose information about toxic materials. He stated that the inventory has been completed and much of the hazardous material has been removed because of base closure cleanup activities.

III. Action Item Update

Karen Hack stated that she had faxed to LCDR Petouhoff the information he had requested regarding a Navy policy on toxic cleanup. LCDR Petouhoff stated that he received the information and will address it at the next RAB meeting.

Ms. Hack stated that she has requested that she be allowed to attend the monthly progress review meetings for NAS Alameda. She also stated she wants to automatically receive the agenda for the meeting when it is distributed. Ms. Hack stated that she wants clarification on whether community members will be allowed to attend the progress review meetings as suggested earlier by the BCT. LCDR Petouhoff stated that although the Base Realignment and Closure (BRAC) Cleanup Team (BCT) had agreed to allow community members to attend the progress review meetings on specific occasions, the BCT had not agreed to allow for regular attendance by a community member. LCDR Petouhoff stated that this issue will be discussed and he will advise Ms. Hack of the decision before the next RAB meeting.

IV. Focus Group Update

REUSE FOCUS GROUP

Reuse focus group chair Ron Basarich stated that he will be coordinating with Doug de Hann to plan a workshop for RAB members and representatives from the Base Reuse Advisory Group (BRAG) to address accelerating the finding of suitability to lease (FOSL) process. LCDR Petouhoff stated that the BCT welcomes input from the reuse focus group and noted that cleanup activities for 1996 are scheduled to meet the Alameda Reuse and Redevelopment Authorities (ARRA) requests for the year.

ORGANIZATIONAL FOCUS GROUP

Organizational focus group chair Lyn Stirewalt stated that the focus group needs an influx of new members to help finish the charter and help Mr. O'Donoghue with the overall organization of the RAB. She stated that anyone interested in joining the focus group should contact her.

NATURAL RESOURCE FOCUS GROUP

Focus group chair Tom Okey thanked Sherri Withrow for being a source of positive energy in the RAB process. He also thanked LCDR Petouhoff for his broad perspective within the confines of the Navy hierarchy. Mr. Okey also thanked Dr. Smith for his intellectual leadership within the RAB.

Mr. Okey stated that a focus group meeting was not held this month. He distributed a handout summarizing models for estimating transport of contaminants from Bay Sediment to fish.

TECHNOLOGY FOCUS GROUP

Focus group chair Dr. Smith stated that the meeting planned with Lawrence Berkeley Laboratory representatives has been tentatively rescheduled for 10:00 a.m. to 2:00 p.m. on March 23, 1996, at the Lawrence Berkeley National Laboratories. He stated Wayne Mayer will be coordinating the meeting and will be replacing Dr. Smith as the technology focus group chair.

EARLY ACTIONS FOCUS GROUP

Focus group chair Kent Rosenblum stated that he has been out of town and has therefore not conducted a focus group meeting since the last RAB meeting. He stated that the group will be looking into activities for preparing the soccer field for use.

V. Introduction to Background/Ambient

LCDR Petouhoff began the presentation by explaining that the issue of background/ambient conditions is just beginning and there is not a consensus yet between the regulators and the Navy. He stated that although early in the process, the BCT will present the issue to the RAB so that members will be aware of the issues early in the discussions. He then introduced Dr. Jim Polisini, Department of Toxic Substance Control (DTSC), Dr. Sophia Serda, Environmental Protection Agency (EPA), and Ron Gervason, Regional Water Quality Control Board (RWQCB), who were present as part of the audience.

LCDR Petouhoff presented the following working definitions for the discussion:

Background
Establishing background is part of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process. It is the process of establishing what chemicals are naturally occurring in the area as compared to those which are the result of human activities, including industry and the Navy.

Ambient
The process of establishing what chemicals at NAS Alameda are the result of human activity yet precede the existence of NAS Alameda. NAS Alameda is made of fill material that was dredged from the bay. The fill material is "dirty" from the industrial activities throughout the bay that resulted in soot deposits in the bay sediments prior to dredging the material to create NAS Alameda.

LCDR Petouhoff explained that these issues have been addressed on a small scale in dealing with the soccer field lease. He stated that elevated levels of arsenic were found in the soil; however, investigations show that elevated levels of arsenic are found throughout the bay area and arsenic is naturally occurring. Because elevated levels of arsenic are not the result of any human activities, the presence of arsenic is considered a part of the background conditions. LCDR Petouhoff then explained that elevated levels of benzo (a) pyrene (industrial soot) were found in the soccer field soil. The soot is the result of industrial activity that resulted in deposits in the bay sediments that were eventually dredged and used to create NAS Alameda. The industrial soot is found in all the areas of the base created with fill material from the bay and is not a result of Navy activity so is considered ambient.

Tom Lanphar stated that determining what chemicals are part of background/ambient conditions is what the Navy and regulators are currently trying to accomplish.

LCDR Petouhoff stated that the task involves:

- Establishing what is there (in the soil)
- Establishing what is naturally occurring
- Establishing what is the results of previous industrial activities

Mr. Lanphar stated that this is the key issue being addressed and that there is consensus between the Navy and regulators on some issues, and the discussion continues on several other issues. He stated that part of the discussion is focused on deciding what data sets to use in establishing background/ambient levels.

Mr. Mooney asked if the Navy is responsible for cleaning up the dirty sediments used as fill material in the creation of NAS Alameda. LCDR Petouhoff stated that cleanup levels have not been established yet. He explained that under CERCLA, no cleanup of naturally occurring chemicals beyond background levels is required. He stated that cleanup of ambient chemicals is contingent on evaluating the risk posed by a particular chemical, which, under CERCLA, is different than addressing a release. As an example, LCDR Petouhoff stated that in the case of the soccer field, elevated levels of benzo (a) pyrene (industrial soot) were found and determined to be ambient. Considering the nature of the reuse activity, the ambient soot was determined to pose little risk. LCDR Petouhoff stated that it is his goal to disclose the known risks associated with ambient conditions, and consider the most appropriate reuse activities for the land.

Mr. Basarich asked if soil that contained high levels of naturally occurring chemicals was relocated, how would issues of background/ambient be addressed. Mr. Gervason stated that there are specific examples of this occurring in the south bay, and determining background/ambient conditions was very difficult. He stated that it is important to evaluate each site individually. James Ricks stated that determining background/ambient conditions is a very difficult process.

Mr. Lanphar stated that there are gray areas in what appears to be background/ambient and what is considered a release. He stated that in a case where pesticides were used properly in agriculture, contamination is not considered a release. However, if pesticides were used improperly or there was a spill and contamination resulted, it is considered a release. The most important task is to get background/ambient quantified so that the risk can be considered and that informed decisions can be made.

LCDR Petouhoff continued his presentation by explaining that there are two types of statistical errors that need to be avoided when determining background/ambient conditions.

- **False Negative**
  When a test shows that soil is clean when it is actually dirty

- **False Positive**
  When a test indicates that soil is dirty when it is actually clean

LCDR Petouhoff stated that to avoid these false readings the state has presented an approach that will diminish the false negative readings, showing dirty land as clean; however, this approach is more likely to produce a false positive, showing clean land as dirty. Another approach is being considered in which both methods are used to compliment each other and minimize the false readings.

Mr. Okey stated that it is important to make sure there is a sufficient amount of samples to ensure the accuracy of the tests. He stated that without sufficient sampling the statistics get "weird" and may show dirty soil as clean. Mr. Basarich asked what kind of sampling data will be used. LCDR Petouhoff responded that it is recognized that two objectives must be met to determine background/ambient conditions: obtaining "clean" data, and a sufficient amount of data.

Mr. Basarich asked when the data collection will be completed. LCDR Petouhoff stated that deciding what data sets to use is crucial in determining background and he expects this process to be completed in the coming months. Dr. Polisini explained that an area that had five different soil types took a year and half to determine background levels. He stated that a simple site could take weeks. Mr. Ricks stated that identifying data sets, and determining if data from various sources can be used together, is part of the ongoing process.

Mr. Okey asked if the College of Alameda will be used as a reference site. LCDR Petouhoff stated that several data sites are being considered including the college.

VI. Methodology of Data Acquisition and Statistical Comparisons

Mr. O'Donoghue introduced Theresa Lopez, a senior toxicologist with PRC Environmental Management, Inc. Ms. Lopez explained that she would be outlining what was presented in the technical memorandum Draft Final Statistical Methodology for Background Comparisons (PRC 1995) regarding background/ambient analysis.

Ms. Lopez presented the following (see List of Handouts):

> **Purpose of Background Analysis:** (1) identify chemicals above background levels, (2) meet regulatory requirements and, (3) establish remediation target goals

Ms. Lopez stated that this will be achieved in a five-phase process:

- Planning
- Data collection/validation
- Data presentation
- Statistical tests
- Professional judgment and geochemical analysis (common sense approach)

Ms. Lopez stressed that the goal is to determine whether the site-specific chemical population is different from the background/ambient chemical population. She explained that once it is determined what chemicals and which concentrations of chemicals are naturally occurring, statistical tests can be used to determine if chemicals detected on site are present at levels above those determined to be naturally occurring.

Ms. Lopez stated that the strategy to determining background includes the following.

- Identifying non-impacted areas that can be used as reference points
- Selecting appropriate geographical and geological data sets that will permit statistical comparisons
- Identify background chemicals (naturally occurring) as well as chemicals that are the result of human activity but are distributed throughout the environment
- Distinguish between native soils and fill soil

Ms. Lopez stated that another component in the process is data review which includes the following.

- Develop descriptive summary statistics
- Concentration maps
- Soil type evaluation: distinguishing fill soil and native soil
- Sample size (number of samples)
- Detection frequency (the number of times a chemical is found)

Ms. Lopez gave a description of different approaches in determining background/ambient conditions. She outlined the following:

80% Lower Confidence Limit (LCL)/95th Percentile Approach (brightline approach)

- Advantages include identifying hot spots
- Disadvantages:
  - It is not a statistical test
  - High potential for false positives
  - May indicate positive result even when the average background and site concentrations are identical

Ms. Lopez explained that to address the problems associated with the 80 % LCL/95th percentile approach, statistical tools have been developed. The advantages of using a statistical approach include:

- Relies on a mean concentration and variance of data
- Minimally biased or influenced by:

    - Underlying distributions
    - Sample sizes
    - Nondetects
    - Multiple detection limits
    - Outliers
    - Allows hypothesis testing
    - Statistical differences between populations means determined
    - False negative and positive errors can be specified and controlled

Ms. Lopez explained that the disadvantage to using a statistical approach is that such an approach can not be used to directly identify hot spots.

VII. Question and Answer Period

In response to the presentations by LCDR Petouhoff and Ms. Lopez, RAB members engaged in a discussion with the presenters, asked questions, and made comments including the following:

- Mr. Basarich asked for clarification regarding what is considered "native" soil. He stated that it was his understanding that almost all of NAS Alameda was not native soil. Ms. Lopez stated that portions of the southeastern portion of the base contain native soils. She further explained that native soils are present underneath the fill soil.

- Mr. Mooney asked how deep the Navy is exploring under the fill soil in the search for native soil. Ms. Lopez responded that the depth explored was 10 feet or until groundwater was encountered.

- Mr. Okey stated that the brightline approach is descriptive but doesn't indicate whether the contamination is site related. He asked what the approach would be compared to in determining if the contamination is site related. Ms. Lopez stated that once the appropriate data sets are identified and background/ambient is calculated, the brightline will be calculated using this information.

- Dr. Smith asked Ms. Lopez to clarify which chemicals she was referring to regarding determining background levels. Ms. Lopez stated that the chemicals she is discussing includes all inorganics. An approach has not been agreed upon yet for ambient organic chemicals. Dr. Smith stated he is concerned about the contaminants that bioaccumulate. Ms. Lopez stated that background levels for all metals and those above background will be evaluated for all potential exposure pathways.

- Helen Hillman asked what is done with different data sets that have different detection limits. Ms. Lopez stated that detection limits are an important consideration in determining whether different data sets can be combined. With inorganic data , most chemicals are detected in almost 100% of the samples, so detection limits don't affect results.

- Ardella Daly asked who makes the decisions regarding background/ambient. Mr. Lanphar stated that it is an interagency decision involving the United States Environmental Protection Agency (EPA), the California EPA, and the Navy.

- A member of the public asked whether the Navy will cleanup to background levels or will risk be considered. LCDR Petouhoff stated that both risk calculations and background/ambient levels will be used in determining cleanup levels. Dr. Policini stated that the importance of determining background is that inorganics in background will not be included in the risk assessment. Richard King asked what would happen if the background levels determined still posed a risk and who would be responsible for the cleanup? LCDR Petouhoff stated that there are naturally occurring chemicals in nature that pose a risk to human beings. However, the Navy is not responsible for cleaning up what is naturally occurring.

- Ms. Hack stated that she was concerned about the chemicals determined to be ambient. LCDR Petouhoff stated that all the polynuclear aromatic hydrocarbons (PAH) are the focus of determining what is ambient. He stated that the process includes analyzing the fill material and its distribution, and the history of the site. Mr. Lanphar added that there is an assumption that there is an ambient level to be determined because the fill was dredged from the bay after there had been significant industrial activity in the area. He stated that the question is how to determine what is ambient which is what the Navy and regulatory agencies are grappling with now.

- Gina Kathuria added that the Regional Water Quality Control Board (RWQCB) considers background and human health risk assessment information when considering cleanup levels. She stated that if there is a risk, the RWQCB requires the Navy to explore cleanup options. She stated that information regarding this policy can be found in the Resolution 6816 (see List of Handouts).

- Ms. Stirewalt stated that she was concerned that background/ambient levels will be used to hold the Navy to only minimal cleanup levels.

- Mr. Lanphar stated that if the Navy and the regulatory agencies do come to a conclusion about what is background/ambient this information will be used in the human health risk assessment. This will allow us to streamline our work so that every time we find a PAH we don't have to complete another individual human health risk assessment. Mr. Policini added that in CERCLA, background is meant to be used throughout the process and to establish a frame work for the feasibility study.

- Mr. Okey asked a series of technical questions relating to data sets. Dr. Policini stated that he would talk to Mr. Okey individually and explain these technical issues.

Mr. O'Donoghue thanked the presenters.

The meeting was adjourned at 9:03 p.m.

The next meeting will be held at 7:00 p.m. on Tuesday, April 2, 1996, at the Bachelor Officers Quarters, NAS Alameda.

Naval Air Station, Alameda
Restoration Advisory Board
Agenda
March 5, 1996

Time	*Subject*	*Presenter*
7:00-7:10 P.M.	Introductions and minutes	RAB
7:10-7:15	Co-Chair Announcements	Co-Chairs
7:15-7:20	Action Item Update	RAB
7:20-7:25	Focus Group Announcements	FG Chairs
7:25-8:00	**Introduction to Background/ Ambient** --Objectives-Why it's necessary --Geology-Some definitions	**BCT** LCDR Petouhoff Tom Lanphar
8:00-8:10	BREAK	
8:10-8:30	**Methodology of Data Acquistion & Statistical Comparisions**	**Theresa Lopez, PRC Senior Toxicologist**
8:30-8:45	Application at NAS Alameda	BCT & PRC
8:45-9:00	Question and Answer Period	
9:00	Adjournment	

Naval Air Station, Alameda
Restoration Advisory Board Meeting
Attendance List
6 February 1996

RAB Members

BRAC Cleanup Team

Name	Affiliation
LCDR Mike Petouhoff	NAS Alameda BEC/Navy Co-Chair
Tom Lanphar	DTSC

Facilitator

Heidi Gitterman	Facilitator

RAB Members

Ken O'Donoghue	**Community Co-Chair**
Ron Basarich	RAB Member, Reuse FG
Doug deHaan	RAB Member
Karen Hack	(Alt. for Saul Bloom)
Helen Hillman	NOAA
Gina Kathuria	RWQCB
Richard King	RAB Member
Michele Kortyna	RAB Member
Wayne Mayer	RAB Member
Malcolm Mooney	RAB Member
Bert Morgan	RAB Member
Tom Okey	RAB Member, Natural Resources FG
Gary Olem	RAB Member
William Smith	RAB Member, Technology FG
Lyn Stirewalt	RAB Member, Organizational FG
Michael Torrey	RAB Member

Other Attendees

Eva Cross	Resident
Esther Hill	U.S. EPA
Kathleen Kirkwood	Alameda Times Star
Nora Lew	BAAQMD
Hans Petersen	NAS Alameda
Barbara Price	PLK Enterprises, Inc.
Marie Rainwater	PRC

Other Attendees (cont.)

David Rist	CAL-EPA/DTSC
Keith Sammons	Greenline
Dan Shafer	PRC
Paul Tuttle	Alameda Reuse and Redevelop. Auth.
Larry Ramos	NAS Environmental
Bernard Tong	EFA West
Sherri Withrow	NAS Alameda
Susan Withrow	Resident
Rusty Wulhers	Greenline

Naval Air Station Alameda

Background Analysis

Five-Phase Process

Phase 1:	Planning
Phase 2:	Data collection/validation
Phase 3:	Data presentation
Phase 4:	Statistical tests
Phase 5:	Professional judgment and geochemical analyses

Strategy

- Identify appropriate background areas (non-impacted areas)
- Select appropriate geographical and geological data sets that will permit statistical comparisons

Data Review

- Develop descriptive summary statistics:
  - arithmetic/geometric average, concentration range
  - detection limit range
- Concentration maps
- Soil type evaluation:
  - geologic units
- Sample size
- Detection frequency

80% LCL/95th Percentile Approach

- Advantages:
  - Identifying hot spots
- Disadvantages:
  - It is not a statistical test
  - High potential for false positives
  - May indicate positive result even when the average background and site concentrations are identical

Statistical Tools

- Allows hypothesis testing
- Statistical differences between population means determined
- False negative (Type I) and positive (Type II) errors can be specified and controlled

◆ Disadvantages:

- Cannot be directly used to identify hot spots

Transport of Contaminants from Bay Sediment to Fish: Case Studies of PCB Uptake at NAS Alameda Sites

Progress Report Information Sheet, 5 March 1996

Conservation Science Institute

Tira Foran[1], Thomas A. Okey[2]

Transport of contaminants, like PCB's, from sediment to fish can be estimated using Young's (1988; Lee et al. 1993) approach of integrating two models: an equilibrium partitioning bioaccumulation model and an exponential bioaccumulation model. This approach can be used to reliably estimate the concentrations of contaminants that would accumulate in fish living in a hypothetical closed system (an area in which fish stay), provided there is adequate information on contaminant concentrations in sediment and the carbon content of that sediment. The exponential bioaccumulation model alone can be used if information is available on contaminant concentration in benthic prey. Young's (1988) exponential bioaccumulation model is shown below:

$$C_y = (C_x)(TSAF)^{(TLy-TLx)}$$

where:

C_y = pollutant tissue concentration of predator

C_x = pollutant tissue concentration of prey

TSAF = trophic step amplification factor = $C_y / (C_x)(TLy-TLx)$

TLy = trophic level of predator

TLx = trophic level of prey

This empirical model is based on validated quantitative information about the trophic levels (food web position) of various species and the observed "behavior" of a chemical in such a food web. This exponential bioaccumulation model will produce a curve of predicted contaminant concentrations in the tissues of organisms that occupy various trophic levels (*see curve on* Figure 1).

Contaminant data from the Western Bayside and Oakland Estuary sites are of limited usefulness because the PCB detection limits were set too high during sample analysis (200 ppb). We know that concentrations of PCB's did not exceed 200 ppb in clams exposed to Western Bayside and Oakland Estuary sediment. To account for this uncertainty, we constructed three scenario's assigning prey tissue residues to 25, 50, and 75% of the method detection limit and multiplying by three (3) to convert bioaccumulation data to benthic prey tissue residue (Lee et al. 1993). These scenario's produced the three curves plotted in Figure (1).

Measured concentrations of contaminated fish tissues can then be plotted on the same graph. We plotted measured concentrations of PCB's in various species of fish captured in other locations in the San Francisco Bay (SFRWQCB 1994)(Figure 1). Not only were these fish captured in other places, many of them are mobile and probably accumulate contaminants from more than one location throughout their home range. The curve of predicted concentrations can than be compared to the plotted measured concentrations. If the plotted measured concentrations fall below the curve, this indicates that the modeled area is a source area for the contaminant in question. In this case it would indicate that NAS Alameda's Western Bayside and Oakland Estuary sediment contributes more PCB's than other places within the home ranges of the fish. The largest source of uncertainty in this example is the lack of information due to high method detection limits. These predictive models can be refined when more information becomes available.

This progress report is presented to provide an example of how this modeling approach can be applied. Please feel free to provide any comments or suggestions on improving this approach.

Literature Cited

Lee, H. et al. 1993. Draft Ecological Risk Assessment of the Marine Sediments at the United Heckathorn Superfund Site. U.S. EPA ERL-Narragansett and Region IX. ERL-N: N269.

SFRWQCB. 1994. Contaminant levels in fish tissue from San Francisco Bay. San Francisco Bay Regional Water Quality Control Board, California Department of Fish and Game, and State Water Resources Control Board.

Young, D.R. 1988. Report on the Assessment and Application of Pollutant Biomagnification Potential in Near Coastal Waters. Environmental Research Laboratory—Narragansett, U.S. Environmental Protection Agency, Newport, OR, No 7992(A).

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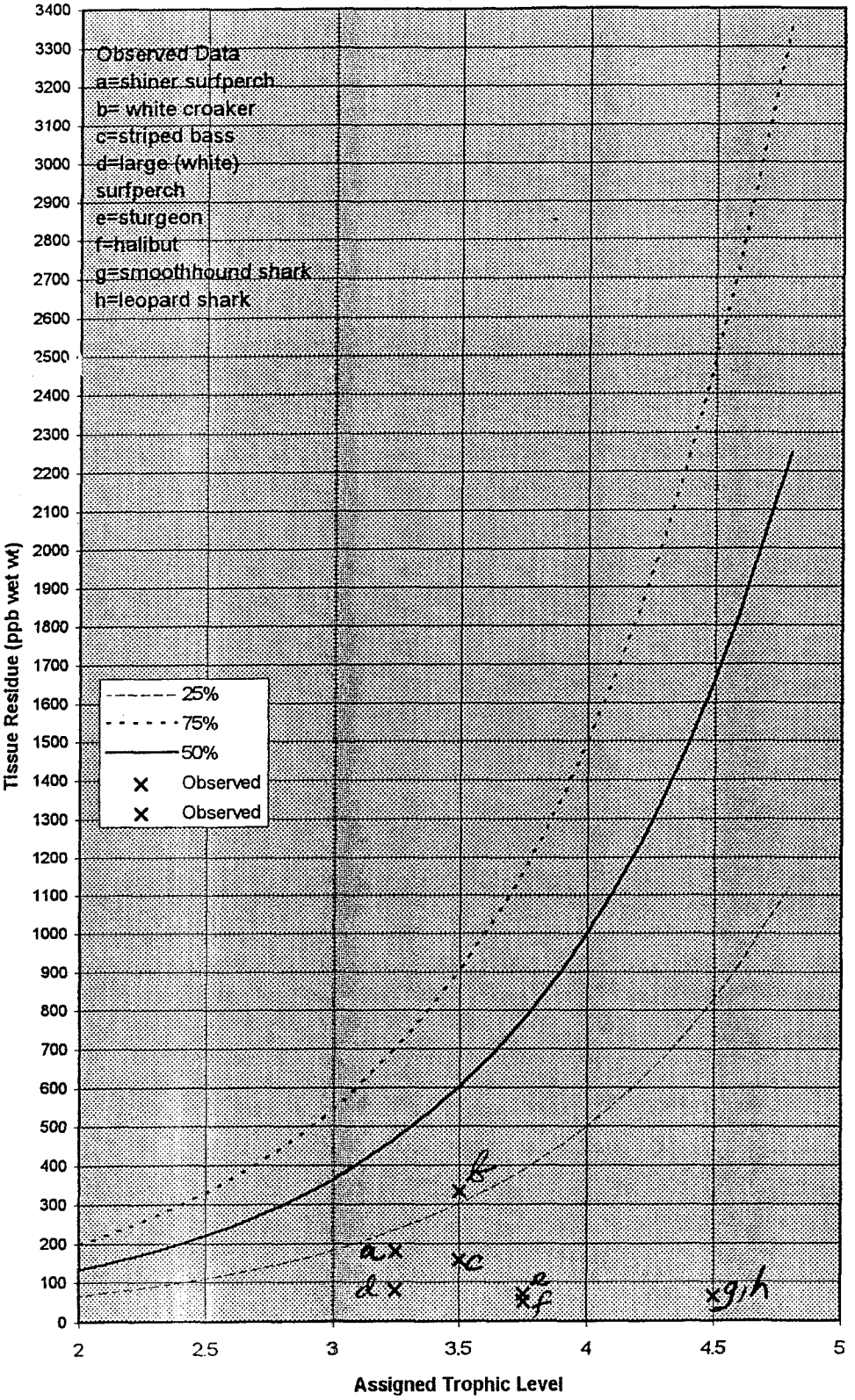
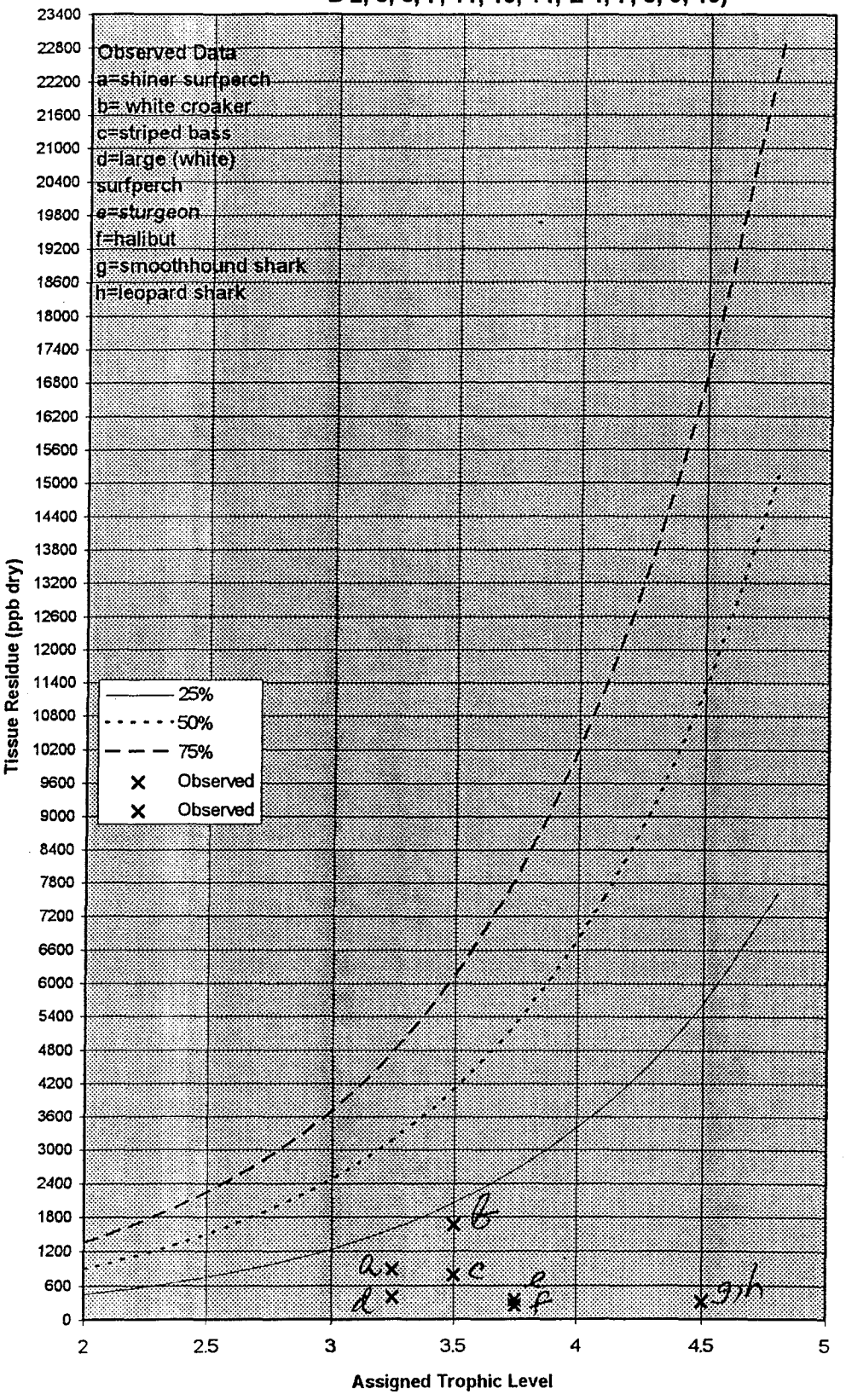
[2] Conservation Science Institute, 5163 Golden Gate Ave, Oakland CA 94618-2029, (510) 652-3959

Fig. 1 Observed vs. Predicted Total PCB Residues (ppb wet wt) Under Three Scenarios of Benthic Infauna Tissue Residue (NAS Alameda Stations B 2, 3, 5, 7, 11, 13, 14; E 4, 7, 8, 9, 10)



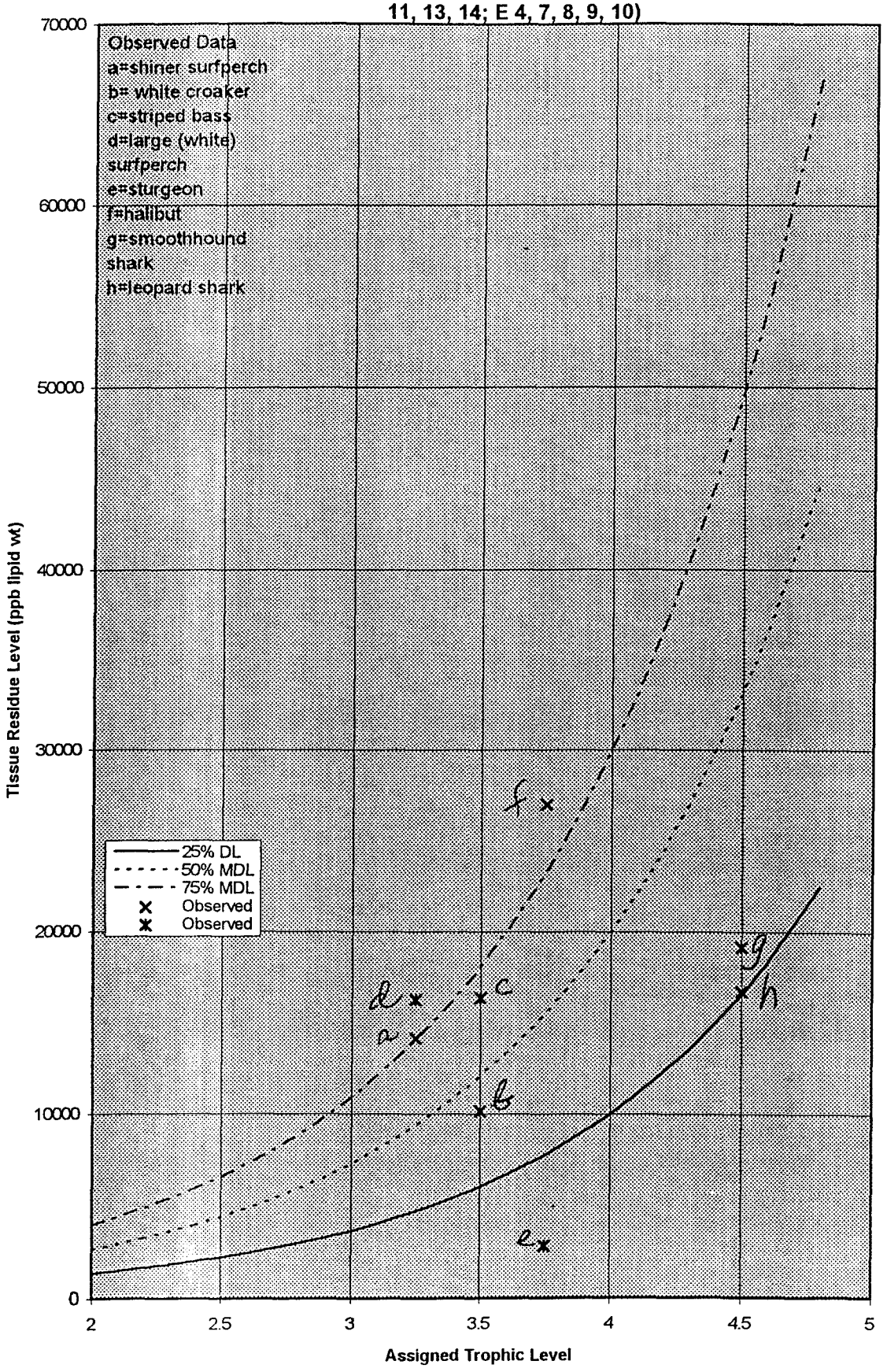
"Observed" = mean tissue residues (RWQCB, 1994).
Base Organism: *Macoma nasuta*
Scenarios described in text.
EPA Pilot Study Screening Value for Human Fish Consumption = 3 ppb (wet wt)

Fig. 1.1 Observed vs. Predicted Total PCB Residues (ppb dry wt) Under Three Scenarios of Benthic Infauna Tissue Residue (NAS Alameda Stations B 2, 3, 5, 7, 11, 13, 14; E 4, 7, 8, 9, 10)



"Observed" = mean tissue residues (RWQCB, 1994).
Base Organism: *Macoma nasuta*
Scenarios described in text.

Fig 1.2 Observed vs. Predicted Total PCB Residues (ppb lipid wt) Under Three Scenarios of Benthic Infauna Tissue Residue (NAS Alameda Stations B 2, 3, 5, 11, 13, 14; E 4, 7, 8, 9, 10)



STATE WATER RESOURCES CONTROL BOARD

RESOLUTION NO. 68-16

STATEMENT OF POLICY WITH RESPECT TO
MAINTAINING HIGH QUALITY OF WATERS IN CALIFORNIA

WHEREAS the California Legislature has declared that it is the policy of the State that the granting of permits and licenses for unappropriated water and the disposal of wastes into the water of the State shall be so regulated as to achieve highest water quality consistent with maximum benefit to the people of the State and shall be controlled so as to promote the peace, health, safety, and welfare of the people of the State; and

WHEREAS water quality control policies have been and are being adopted for waters of the State; and

WHEREAS the quality of some waters of the State is higher than that established by the adopted policies and it is the intent and purpose of this Board that such higher quality shall be maintained to the maximum extent possible consistent with the declaration of the Legislature;

NOW, THEREFORE, BE IT RESOLVED:

1. Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water, and will not result in water quality less than that prescribed in the policies.

2. Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.

3. In implementing this policy, the Secretary of the Interior will be kept advised and will be provided with such information as he will need to discharge his responsibilities under the Federal Water Pollution Control Act.

BE IT FURTHER RESOLVED that a copy of this resolution be forwarded to the Secretary of the Interior as part of California's water quality control policy submission.

CERTIFICATION

The undersigned, Executive Officer of the State Water Resources Control Board, does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on October 24, 1968.

Dated: October 28, 1968

/s/
Kerry W. Mulligan
Executive Officer
State Water Resources
Control Board

"6. It shall be prohibited to discharge all conservative toxic and deleterious substances, above those levels which can be achieved by a program acceptable to the Board, to waters of the Basin."

The intent of this prohibition as specified by the Board in its Basin Plan is "to minimize the discharge of persistent toxicants into waters, thus protecting aquatic life and public water supplies."

Nondegradation Policy - The State Board expressed its policy on maintaining the high quality of California's waters within the document. The manner in which this Policy is interpreted and implemented will have a profound effect on the establishment of a procedure to set "clean-up" standards as well as the standard itself.

The key provision of the Policy reads as follows:

"1. Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in the policies."

The State Board has expressed its intent within a subsequent guidance document (Management Memo No. 18, Feb., 1973) that this provision apply to all surface and groundwaters that have an existing or potential beneficial use. Further, it is the intent of the State Board that as a general rule, the waters of the State shall not be degraded beyond their present quality by waste discharges due to man's activities. Strict application would mean that no level of hazardous materials could be discharged into any stream or aquifer.

Provision 1 contains three conditions under which a change is allowable. These conditions must all be satisfied and are: A change must be consistent with the maximum benefit to the people of the State; a change must not unreasonably affect beneficial use of the water; and a change must not result in water quality less than that prescribed in the Board's plans and policies. Within Management Memo No. 18 the State Board has provided interpretations of these provisions.

The first condition contains the phrase "maximum benefit to the people". The State Board interprets this in the following manner: "... it must be assumed that "maximum benefit" has a predominantly social and economic meaning. That is, existing water quality must be maintained unless such a policy would require actions clearly inconsistent with the benefits obtained, or actions which pose hardships for a certain segment of the State greater than the benefits obtainable for that or another segment."

The second condition contains the phrase "unreasonably affect beneficial use of the water." The State Board interprets this in the following manner: "...unreasonably affect beneficial use of the water implies a judgment of reasonableness on the part of the planner. This must be supported by as rigorous an analysis as possible of the effect of the proposed change on beneficial uses. An unreasonable affect would be any detrimental change in or a measurable reduction of beneficial uses".

The last condition refers to other State Policies which in this case are contained in the Regional Board's Basin Plan.

CEQA - The Legislative in Chapter 1 (Section 21000) of the California Environmental Quality Act listed a number of declarations of intent and among these is the following:

> "(d) The capacity of the environment is limited, and it is the intent of the Legislature that the government of the state take immediate steps to identify any critical thresholds for the health and safety of the people of the state and take all coordinated actions necessary to prevent such thresholds being reached."

The above declaration indicates that each cleanup plan should prevent "critical thresholds for the health and safety of the people of the state" from being reached. This implies that an environmental determination is required as part of the Regional Board's approval of each cleanup plan. The decision to use CEQA Categorical exemptions or require the preparation of other environmental documents should be made on a case-by-case basis.

III. PROPOSED PROCEDURE

In identifying the goals of a clean-up standard, existing policy statements dictate the maintenance of existing water quality unless sufficient justification can be made for anything less.

The procedure for determining whether maintenance of existing water is reasonable must be based on technical and economic considerations and the consequences of allowing degradation relative to potential and existing beneficial uses.

There are a range of alternative strategies which define a scale available for setting clean-up standards. The following three basic alternatives define that range.

1) Maintain Existing Water Quality - This alternative implies that the modification of the chemical, physical and/or biological properties of existing water is prohibited. Therefore, all discharged hazardous materials would have to be prevented from entering groundwater or removed from groundwater.

2) Allow water quality degradation without affecting beneficial uses - This alternative would allow for some water quality degradation but would demand the preservation of existing and potential beneficial uses.

3) Allow water quality degradation with the resultant loss of one or more beneficial uses - This alternative would allow for water quality degradation at a level which would affect beneficial uses. It is not anticipated that this alternative will be approved under most circumstances.

As noted, the above alternatives define a degradation scale, shown in the attached Figure 1, with alternative one (no degradation) as one extreme and alternative three (loss of beneficial uses) as the other extreme. The scale is defined by identification of beneficial uses and the water quality necessary to protect those beneficial uses. All available existing water quality criteria as well as information in the literature will be used to identify the water quality necessary to protect the beneficial uses. Existing State and Regional Board policies dictate the maintenance of existing water quality (alternative 1) unless sufficient justification can be made for

anything less. Movement down the scale requires consideration of the maximum benefit to the people. The factors which will be used to determine the maximum benefit to the people and ultimately an acceptable location on the degradation scale include the cost of achieving various levels of clean-up, the technical feasibility of achieving various levels of clean-up, and public opinion.

The procedure that follows from the above considerations is best illustrated by the following general example.

Example:

A hazardous material discharge is identified at an industrial facility located within a groundwater basin. The vertical and lateral extent of the discharge has been identified and the geohydrology of the immediate area has been characterized. As part of this characterization the contaminated zone has been identified as well as its potential for migration to all other lower groundwater zones and surrounding ground and surface waters.

Before a decision can be made regarding the clean-up objectives it is necessary to identify the following elements:

- Existing water quality;
- Existing and potential beneficial uses;
- Any available water quality criteria, including technical literature;

- Proposed clean-up strategies within the zone of contamination including, at a minimum, alternatives 1, 2, and one other;
- Proposed strategies to control the spread of contamination both vertically and laterally, including alternatives 1 and 2;
- A proposal for long-term monitoring to verify attainment of the objectives.

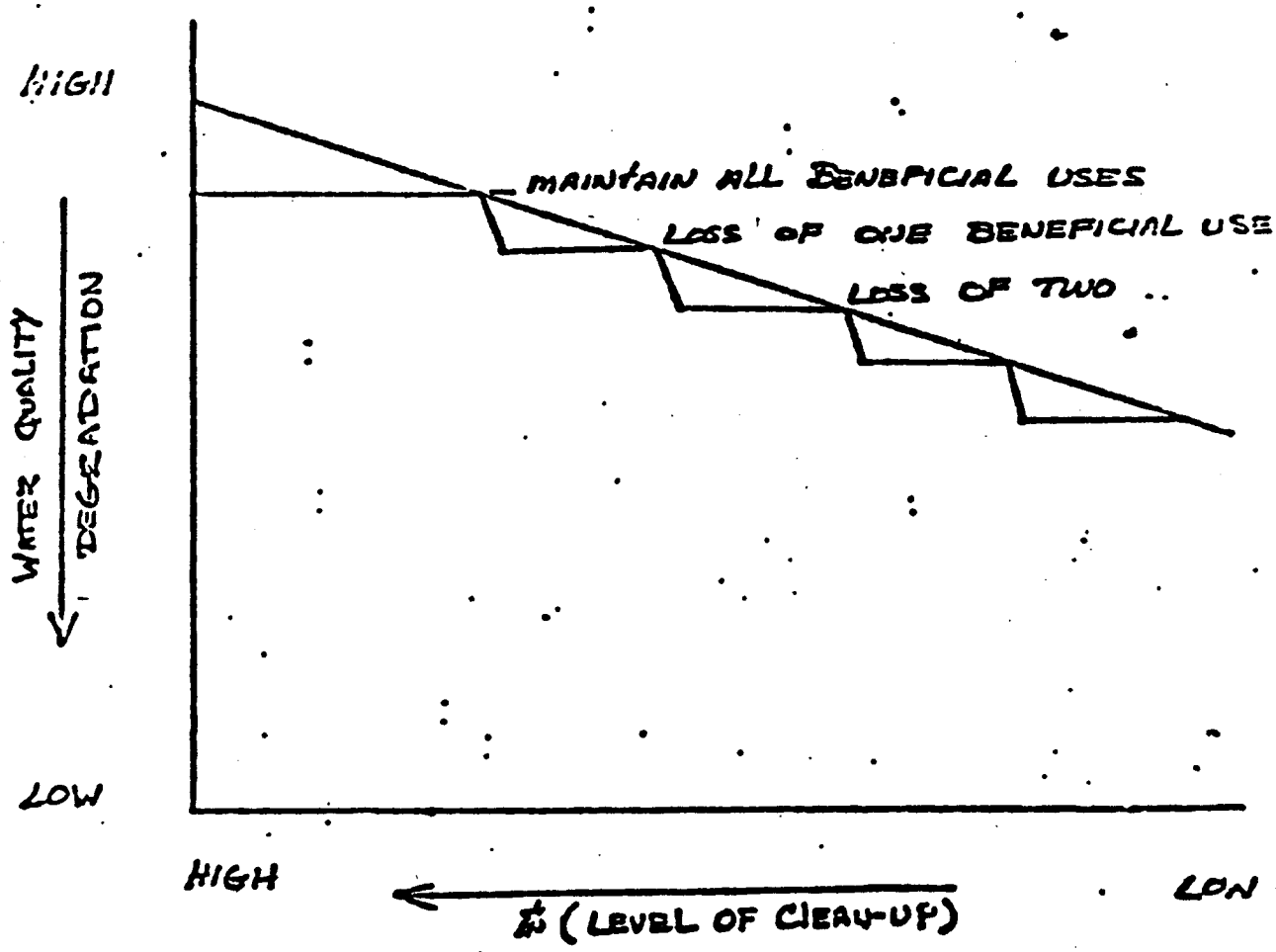
The above information can then be used to construct a cost versus degradation curve, as shown in the attached Figure 2. The above information including the cost-degradation curve will be used to identify and select the appropriate alternative strategy.

Based on the above information, the Regional Board staff will recommend clean-up objectives to the Executive Officer. The recommendation will also identify the discharger's clean-up strategy to achieve those objectives. The Executive Officer will review the staff recommendation and determine the appropriate Regional Board action.

FRED H. DIERKER
Executive Officer

3/9/83
Date

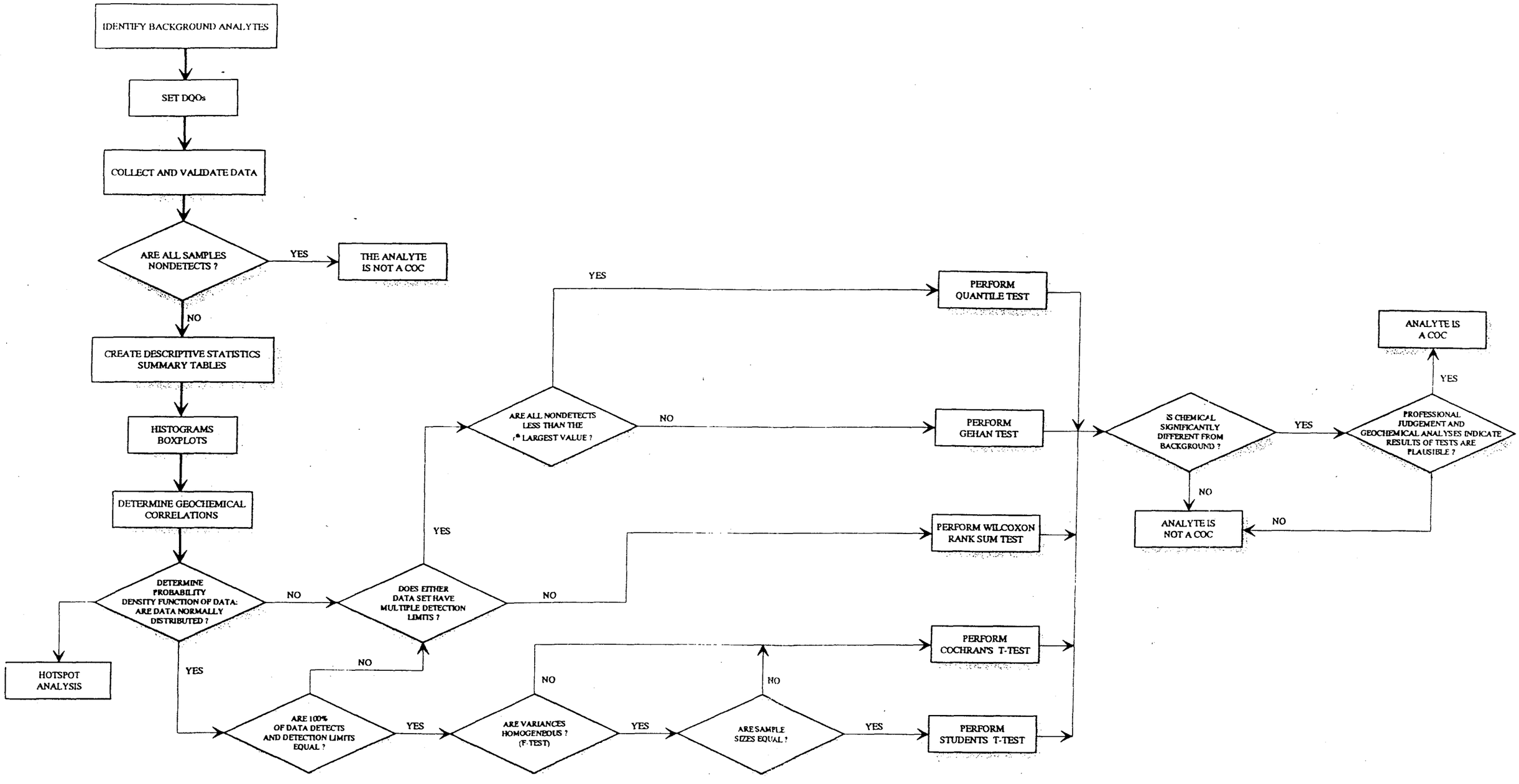
Approved



STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

FIGURE 1

DRAWN BY: | DATE: | APPROVED:



* SEE SECTION 5.5.2 FOR DESCRIPTION OF r

FIGURE 2
FLOW CHART FOR COMPARING SITE DATA TO BACKGROUND