AECRU Contract Number N68711-00-D-0005
Delivery Order 0007

REVISED FEASIBILITY STUDY

IRP SITE 1, NAVAL BASE VENTURA COUNTY
POINT MUGU, CALIFORNIA

March 2004

Prepared for

DEPARTMENT OF THE NAVY
Michael J. Gonzales, Remedial Project Manager
Southwest Division
Naval Facilities Engineering Command
San Diego, California

Prepared by

TETRA TECH EM INC.
1230 Columbia Street, Suite 1000
San Diego, CA 92101
(619) 525-7188

for

Katy Norris, Project Manager

DS.A007.10571

CONTENTS

ACRONYMS AND ABBREVIATIONS VI

EXECUTIVE SUMMARY 1

1.0 INTRODUCTION 1

1.1 Purpose and Organization of Report 1

1.1.1 Purpose 1

1.1.2 Organization 3

1.2 Background Information 3

1.2.1 Site Description 6

1.2.2 Site History 24

1.2.3 Nature and Extent of Contamination 32

1.2.4 Contaminant Fate and Transport 38

1.2.5 Baseline Risk Assessment 41

1.3 Conclusions 45

2.0 IDENTIFICATION OF APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND REMEDIAL ACTION OBJECTIVES 46

2.1 INITIAL DETERMINATION OF ARARs 46

2.1.1 Federal Chemical-Specific 47

2.1.2 Federal Location-Specific 47

2.1.3 Federal Action-Specific 48

2.1.4 State Chemical-Specific 48

2.1.5 State Location-Specific 48

2.1.6 State Action-Specific 48

2.2 REMEDIAL ACTION OBJECTIVES 49

2.2.1 Landfill Gas 49

2.2.2 Soils 49

2.2.3 Groundwater 49

3.0 DEVELOPMENT AND SCREENING OF ALTERNATIVES 50

3.1 SELECTION OF REMEDIAL OPTIONS 50

3.1.1 No Further Action 50

3.1.2 Institutional Controls 50

3.1.3 Site Boundary Controls 51

3.1.4 Landfill Cover Repair, Maintenance, and Drainage Improvements 51

3.2 SELECTION OF REMEDIAL ALTERNATIVES 51

3.3 DETAILED ANALYSIS OF ALTERNATIVES 52

3.3.1 Overall Protection of Human Health and the Environment 52

3.3.2 Compliance with ARARs 52
3.3.3 Long-term Effectiveness and Permanence 52
3.3.4 Reduction in Toxicity, Mobility, and Volume through Treatment 54
3.3.5 Short-term Effectiveness 54
3.3.6 Implementability 55
3.3.7 Cost 55
3.3.8 State Acceptance 56
3.3.9 Community Acceptance 56
3.4 Alternative 1: No Further Action 56
3.4.1 Overall Protection of Human Health and the Environment 56
3.4.2 Compliance with ARARs 57
3.4.3 Long-term Effectiveness and Permanence 57
3.4.4 Reduction in Toxicity, Mobility, and Volume through Treatment 57
3.4.5 Short-term Effectiveness 57
3.4.6 Implementability 57
3.4.7 Cost 58
3.4.8 State Acceptance 58
3.4.9 Community Acceptance 58
3.5 Alternative 2: Institutional Controls 58
3.5.1 Overall Protection of Human Health and the Environment 58
3.5.2 Compliance with ARARs 58
3.5.3 Long-term Effectiveness and Permanence 59
3.5.4 Reduction in Toxicity, Mobility, and Volume through Treatment 59
3.5.5 Short-term Effectiveness 59
3.5.6 Implementability 59
3.5.7 Cost 60
3.5.8 State Acceptance 60
3.5.9 Community Acceptance 60
3.6 Alternative 3: Institutional Controls; and Landfill Cover Repair, Maintenance, and Drainage Improvements 60
3.6.1 Overall Protection of Human Health and the Environment 60
3.6.2 Compliance with ARARs 61
3.6.3 Long-term Effectiveness and Permanence 61
3.6.4 Reduction in Toxicity, Mobility, and Volume through Treatment 61
3.6.5 Short-term Effectiveness 61
3.6.6 Implementability 61

3.6.7 Cost 62
3.6.8 State Acceptance 62
3.6.9 Community Acceptance 62
3.7 COMPARATIVE ANALYSIS OF ALTERNATIVES 62
3.7.1 Threshold Criteria 63
3.7.2 Long-term Effectiveness and Permanence 63
3.7.3 Reduction in Toxicity, Mobility, and Volume through Treatment 64
3.7.4 Short-term Effectiveness 64
3.7.5 Implementability 64
3.7.6 Cost 64
3.7.7 State and Community Acceptance 64
3.7.8 Summary 64
4.0 SUMMARY OF EVALUATION 65
5.0 REFERENCES 66

Appendix

A Background Information

B Remedial Investigation Data Tables

C Human Health Risk Assessment Summaries

D Ecological Risk Assessment Summary

E ARARs Identification and Evaluation

F Alternative Cost Components

FIGURES

1-1 U.S. Department of the Navy Installation Restoration Program CERCLA Process 2

1-2 Vicinity Map 4

1-3 Site Location 5

1-4 Disposal/Storage areas 7

1-5 Geophysical Anomalous Areas 9

1-6 Geological cross-section a-a' 13

1-7 Geological cross-section A-A' 14

1-8 Hydrostratigraphy of NBVC Point Mugu 15

1-9 Sites 1 and 2 Groundwater Surface Contours 17

1-10 Base Drainage Areas 23

1-11 Aerial Photograph July 1975 27

1-12 COPCs for Phase I Remedial Investigation 34

1-13 COPCs for Phase I Remedial Investigation Addendum 35

1-14 Remedial Investigation for Groundwater Sampling Points 36

1-15 Remedial Investigation for Surface Water Sampling Points 37

TABLES

1-1 Groundwater Elevations Corrected for Tidal Variation at IRP Site 1 18

1-2 Tidal Influence Data for IRP Site 1 18

1-3 Hydraulic Conductivities for IRP Site 1 19

1-4 Groundwater Flow Velocities at IRP Site 1.....19

1-5 Types and Quantities of Wastes Disposed of at IRP Site 1 25

1-6 Results of Soil Sampling During Site Investigation at IRP Site 1 29

1-7 Results of Groundwater Sampling During Site Investigation at IRP Site 1 30

3-1 Comparative Summary of Remedial Alternatives 53

ACRONYMS AND ABBREVIATIONS

AECRU	Indefinite Quantity Contract for Architectural-Engineering Services to Provide CERCLA/RCRA/UST Studies
ARAR	Applicable or relevant and appropriate requirement
AWQC	Ambient water quality criteria
BAF	Bioaccumulation factor
BERA	Baseline ecological risk assessment
bgs	Below ground surface
BHC	Benzene hexachloride
BMP	Best management practice
Cal/EPA	California Environmental Protection Agency
CCR	*California Code of Regulations*
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	*Code of Federal Regulations*
cm/s	Centimeter per second
COC	Chemical of concern
COPC	Chemical of potential concern
COPEC	Chemical of potential ecological concern
CWA	Clean Water Act
CZMP	Coastal zone management plan
DD	Drainage ditch
DDD	Dichlorodiphenyl-dichloroethane
DDE	Dichlorodiphenyl-dichloroethene
DDT	Dichlorodiphenyl-trichloroethane
DO	Delivery order
DTSC	Department of Toxic Substances Control
DWR	California Department of Water Resources
ELCR	Excess lifetime cancer risk
EPA	U.S. Environmental Protection Agency
EPC	Exposure point concentration
ERA	Ecological risk assessment
ER-M	Median value of the effects range
ESA	Endangered Species Act
FS	Feasibility study
FSP	Field sampling plan
HHRA	Human health risk assessment

HI	Hazard index
HQ	Hazard quotient
IAS	Initial Assessment Study
IRP	Installation Restoration Program
IWMB	Integrated Waste Management Board
JMM	James M. Montgomery Engineers, Inc.
LEA	Local enforcement agency
µg/kg	Microgram per kilogram
mg/kg	Milligram per kilogram
mg/L	Milligram per liter
msl	Mean sea level
Navy	U.S. Department of the Navy
NAWS	Naval Air Weapons Station
NBVC	Naval Base Ventura County
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPDES	National Pollutant Discharge Elimination System
O&M	Operation and maintenance
PAH	Polynuclear aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PRC	PRC Environmental Management, Inc.
PRG	Preliminary remediation goal
RA	Remedial alternative
RAO	Remedial action objective
RCRA	Resource Conservation and Recovery Act
RI	Remedial investigation
ROD	Record of decision
RWQCB	Regional Water Quality Control Board, Los Angeles Region
SARA	Superfund Amendments and Reauthorization Act
SI	Site inspection
SVOC	Semivolatile organic compound
SWRCB	California State Water Resources Control Board
TCDD	Tetrachlorodibenzo-p-dioxin

TCE	Trichloroethene
TDS	Total dissolved solids
Tetra Tech	Tetra Tech EM Inc.
TOC	Total organic carbon
USC	*United States Code*
VOC	Volatile organic compound

EXECUTIVE SUMMARY

This revised feasibility study (FS) was prepared as part of the U.S. Department of the Navy Installation Restoration Program (IRP) for IRP Site 1 at Naval Base Ventura County (NBVC) Point Mugu. The evaluations in this FS are based largely on the sampling, findings, and conclusions from previous investigations and activities at NBVC Point Mugu. During the review process for this FS, the Navy received agency comments and new characterization data, and reached new conclusions about threats to human health and the environment at the site. The Navy decided to change its approach significantly and prepare this revised FS. Tetra Tech EM Inc. (Tetra Tech) prepared this FS in accordance with the IRP and the U.S. Environmental Protection Agency's (EPA) *Guidance for Conducting Remedial Investigations and Feasibility Studies Under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)* (EPA 1988).

Background

IRP Site 1 is located at NBVC Point Mugu, in Ventura County, California, about 50 miles northwest of Los Angeles. The eastern part of IRP Site 1 is adjacent to Mugu Lagoon, near the mouth of Calleguas Creek. From 1952 until 1975, IRP Site 1 was used for lowland filling and solid waste landfilling and burning operations. There is no hazardous waste at IRP Site 1. The landfill was closed in 1975 in accordance with then-current regulations.

The Navy's conclusion that the landfill was closed in 1975 is based primarily on data compiled during the site investigations, remedial investigations, and further research completed as part of the FS. These data and research are presented in Sections 1.2.2.1 and 1.2.2.2. A 1975 aerial photograph indicates that the site had stopped receiving waste and was closed by grading and covering. In recent years, as a result of the IRP, the Navy has decided to chip seal the majority of the site. Where chip seal is not installed, the appropriate level of cover repair and maintenance will be provided as agreed with the state agencies. Due to insufficient funding, the cover has been in need of repair and surface improvements. Currently, however, the Navy has a contract in place to repair and maintain the cover.

Human Health and Ecological Risks

Chemicals of potential concern (COPC) and chemicals of potential ecological concern (COPEC) were identified at IRP Site 1. Human health COPCs identified for soil were polynuclear aromatic hydrocarbons (PAH); pesticides; polychlorinated biphenyls (PCB); dioxins; and inorganic chemicals, including lead. COPCs for surface water were dibromochloromethane, gamma-benzene hexachloride (gamma-BHC), heptachlor epoxide, aluminum, arsenic, boron, thallium, and vanadium. There were no COPCs for groundwater. COPECs identified for soil were fluoranthene, pyrene, PCBs, isomers of dichlorodiphenyltrichlorethane (DDT), dieldrin, copper, and lead. COPECs identified for groundwater were copper, mercury, nickel, PCBs, and phosphorus. There were no COPECs for surface water. Human health risk assessments (HHRA) and ecological risk assessments (ERA) performed as part of this FS and in three sets of earlier

studies, did not identify any chemicals of concern (COC) causing unacceptable risk at IRP Site 1 under the reasonably anticipated future land-use scenario. It was determined that, with appropriate remedial actions, the Navy can maintain a minimal and acceptable risk to both human health and the environment from IRP Site 1.

The three previous studies for IRP Site 1 and their key findings used in this FS are as follows:

- Remedial investigation (RI) technical memorandum (Tetra Tech 2000) and RI addendum (Tetra Tech 2001a)
  - The excess lifetime cancer risk (ELCR) for soils was estimated between 1×10^{-4} and 1×10^{-6}, which falls within the range the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) defines as acceptable for industrial workers in an industrial land use scenario.
  - The chronic toxicity hazard indices (HI) for noncarcinogenic chemicals in soils were less than 1, indicating their concentration were found to be insufficient to cause adverse noncancer health effects.
  - The ERA concluded that chemical concentrations in soils were insufficient to cause adverse environmental effects.
- RI for groundwater (Tetra Tech 2004)
  - The ELCR for surface water and groundwater was estimated between 1×10^{-4} and 1×10^{-6}, within the range the NCP defines as acceptable for wildlife managers in a wildlife management land use scenario.
  - The HIs for noncarcinogenic chemicals in surface and groundwater were less than 1, indicating that chemical concentrations were insufficient to cause noncancer adverse health effects as long as water from the site was not ingested.
  - Because of the elevated concentrations of metals in upstream surface water and the low concentrations of metals in IPR Site 1 groundwater, groundwater at IRP Site 1 is not considered a potential contributor to elevated concentrations of metals in downstream surface water.
  - Trichloroethene (TCE) was identified as a COPEC in groundwater; further evaluation of TCE, however, indicated that it would not pose a long-term ecological risk.
  - The presence of fine-grained sediments and the tidal action at the site will increase the potential for metals to be bound to soil and sediment particles.
  - Higher salinities, such as those present at NBVC Point Mugu, can decrease the bioavailability of metals.
  - The neutral pH condition of surface water samples at NBVC Point Mugu suggests that adverse effects attributable to pH will be limited. The pH of surface water

samples at NBVC Point Mugu ranges from 7.66 to 8.69, which is likely to decrease the bioavailability of metals to aquatic receptors.

- Risk to vertebrates technical memorandum (Tetra Tech 2001b)
  - Ecological risks to vertebrates, including mammals and birds, are low due to the elevated pH of the soil, which limits the bioavailability of metals.
- Ecological risk assessment addendum (Tetra Tech 2003)
  - Further evaluation of certain COPECs in the ERA for surface water at IRP Site 11 did not indicate a risk to ecological receptors.
  - Chromium remains under study at IRP Site 11 because of concentrations that exceed background reference levels.

Applicable or Relevant and Appropriate Requirements and Remedial Action Objectives

Tetra Tech reviewed the available information about IRP Site 1 to identify applicable or relevant and appropriate requirements (ARAR). Based on CERCLA requirements, the results of the human health and ecological risk assessments in the three previous studies, and ARARs, the following remedial action objectives (RAO) were proposed for soils at IRP Site 1:

- Prevent residential land use.
- Repair the existing cover and improve drainage south of 13th Street, where necessary.
- Address the physical safety hazard presented by surface solid waste located in the western part of the solid waste and fill areas.
- Prevent disturbance of the subsurface soil and contents of landfill.

The RAO for landfill gas at IRP Site 1 is as follows:

- Verify that IRP Site 1 does not have methane gas levels greater than the limits outlined in pertinent sections of Title 27 of the *California Code of Regulations*.

The RAO ensures an evaluation of the suitability of the existing cover with respect to landfill gas. Due to the age of the waste, it is assumed that there is negligible, if any, gas generation at the site. Because the existing cover does not have any gas control measures, this assumption must be verified to protect human health risks from gas inhalation and explosion. Gas monitoring will also continue to occur as part of routine operation and maintenance, as documented in the CERCLA 5-year reviews.

Also, the following RAOs were proposed for groundwater at IRP Site 1:

- Prevent the use of IRP Site 1 groundwater as a source of drinking water.

Screening of Remedial Action Alternatives

Potential remedial measures were screened using effectiveness, implementability, and cost criteria. The effectiveness evaluation considered the ability of a remedial measure to protect human health and the environment, to comply with ARARs, and to meet RAOs. After screening, the following three remedial action alternatives were evaluated:

- Alternative 1: No Further Action
- Alternative 2: Institutional Controls
- Alternative 3: Alternative 2, along with Landfill Cover Repair, Maintenance, and Drainage Improvements

These alternatives were then evaluated based on the nine criteria required by the NCP in Title 40 of the *Code of Federal Regulations*, part 300.430(e), as follows:

(1) Overall protection of human health and the environment
(2) Compliance with ARARs
(3) Long-term effectiveness and permanence
(4) Reduction of toxicity, mobility, or volume of contaminants
(5) Short-term effectiveness
(6) Implementability
(7) Cost
(8) State acceptance
(9) Community acceptance

The first seven criteria were used in the selection process. Input will be collected for criteria 8 and 9 after the alternatives are presented to the public. A final decision will be made after review of state and community input, the final two criteria.

Feasibility Study Recommendations

Alternative 3 is the only alternative that meets all the NCP criteria and is therefore the recommended alternative for IRP Site 1.

1.0 INTRODUCTION

The Department of the Navy (Navy), Southwest Division, Naval Facilities Engineering Command is conducting this focused feasibility study (FS) for Naval Base Ventura County (NBVC) Point Mugu. This FS report fulfills specific objectives of the scope of work under Delivery Order (DO) No. 0007 of Contract No. N68711-00-D-0005, the Indefinite Quantity Contract for Architectural-Engineering Services to Provide CERCLA/RCRA/UST Studies (AECRU).

Focused FSs are prepared where presumptive remedies are applied or where options are limited. Installation Restoration Program (IRP) Site 1 is a military landfill with municipal-like waste. According to U.S. Environmental Protection Agency (EPA) guidance in *Presumptive Remedy for CERCLA Municipal Landfill Sites* (EPA 1993) and *Application of the CERCLA Municipal Landfill Presumptive Remedy to Military Landfills* (EPA 1996), the presumptive remedy of "containment" is appropriate for this site and this presumptive remedy has been applied. The presumptive remedy of "containment" does not extend to treatment and control of landfill gas, leachate, or groundwater contamination. Each of these pathways will be discussed in further detail in later sections of the FS.

The FS is being conducted in accordance with the *Guidance for Conducting Remedial Investigations and Feasibility Studies under the Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA) (EPA 1988) and *Conducting Remedial Investigations/Feasibility Studies for CERCLA Municipal Landfill Sites* (EPA 1991a).

Tetra Tech EM Inc. (Tetra Tech) conducted the FS and prepared the FS report under the IRP. The FS is based primarily on information in earlier documents prepared by Tetra Tech, including the final Phase I Remedial Investigation (RI) (Tetra Tech 2000), the RI addendum for IRP Sites 1 and 6 (Tetra Tech 2001a), the Risk to Vertebrates Technical Memorandum (Tetra Tech 2001b), and the RI for Groundwater (Tetra Tech 2004). During the review process for this FS, the Navy received agency comments and new characterization data, and reached new conclusions about threats to human health and the environment at the site. The Navy decided to change its approach significantly and prepare this revised FS.

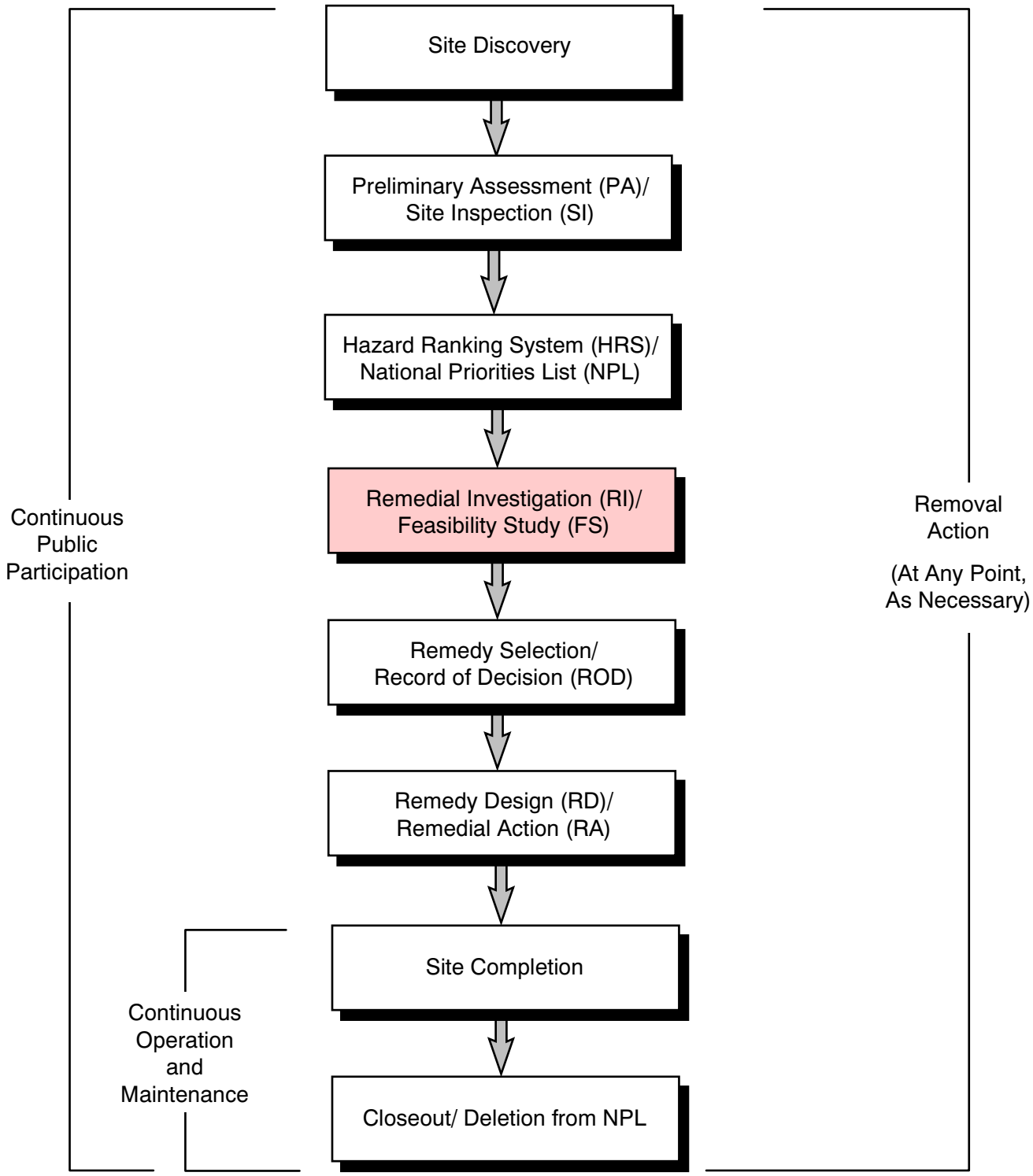
1.1 PURPOSE AND ORGANIZATION OF REPORT

This section describes the objectives of the FS and the overall layout of this document.

1.1.1 Purpose

This FS develops and evaluates potential response actions to address the environmental concerns identified at IRP Site 1 during the RI and the RI for groundwater. It further selects and evaluates remedial alternatives to facilitate IRP Site 1 closure in accordance with the CERCLA process, as shown in Figure 1-1. The FS will be used as the basis for proposed remedial actions, if any are needed, at IRP Site 1. Appropriate components of a postclosure maintenance plan, as described in Title 27 of the *California Code of Regulations*, will be considered and implemented as needed. In addition, the remedial design will provide specific descriptions of the remedial action objectives.

The CERCLA Process



Tetra Tech EM Inc.

LEGEND

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
IRP	Installation Restoration Program

NBVC POINT MUGU, CALIFORNIA
U.S. Navy Southwest Division, NAVFAC, San Diego

FIGURE 1-1
U.S. DEPARTMENT OF THE NAVY
INSTALLATION RESTORATION PROGRAM
CERCLA PROCESS
Revised FS IRP Site 1
DS.A007.10571

R:\Navy\Pt. Mugu\cot-368\FIG 1-1.dsf DN deborah.ford

The Navy, with state regulatory oversight, is the lead agency for the remedial action. As the lead agency, the Navy, with state concurrence, has final approval authority for the selected remedial alternative. The Navy is working with the California Environmental Protection Agency (Cal/EPA); Department of Toxic Substances Control (DTSC); Integrated Waste Management Board (IWMB); Regional Water Quality Control Board, Los Angeles Region (RWQCB); and the California Department of Fish and Game to implement any proposed CERCLA remedial action. The Navy will solicit community involvement and comments.

1.1.2 Organization

The reader's guide in the box to the right highlights the main points of this focused FS, and appears several times throughout the document.

Section 1.2 of the FS summarizes background information for IRP Site 1, including the data collected for IRP Site 1 during site characterization, the nature and extent of contamination at IRP Site 1 and the results of the human health risk assessments (HHRA) and the ecological risk assessments (ERA) performed during the RI.

Section 2.0 defines and discusses applicable or relevant and appropriate requirements (ARAR), and then identifies the federal and state ARARs associated with IRP Site 1. It also identifies the remedial action objectives (RAO) for the site.

Section 3.0 screens potential remedial measures for effectiveness, implementability, and cost, and selects specific response actions and methods for more detailed evaluation. Section 3.0 also defines and discusses nine evaluation criteria specified in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), and provides a detailed analysis of each of the IRP Site 1 remedial alternatives (RA) according to the nine criteria. The nine criteria are then used to compare the RAs against one another.

Reader's Guide

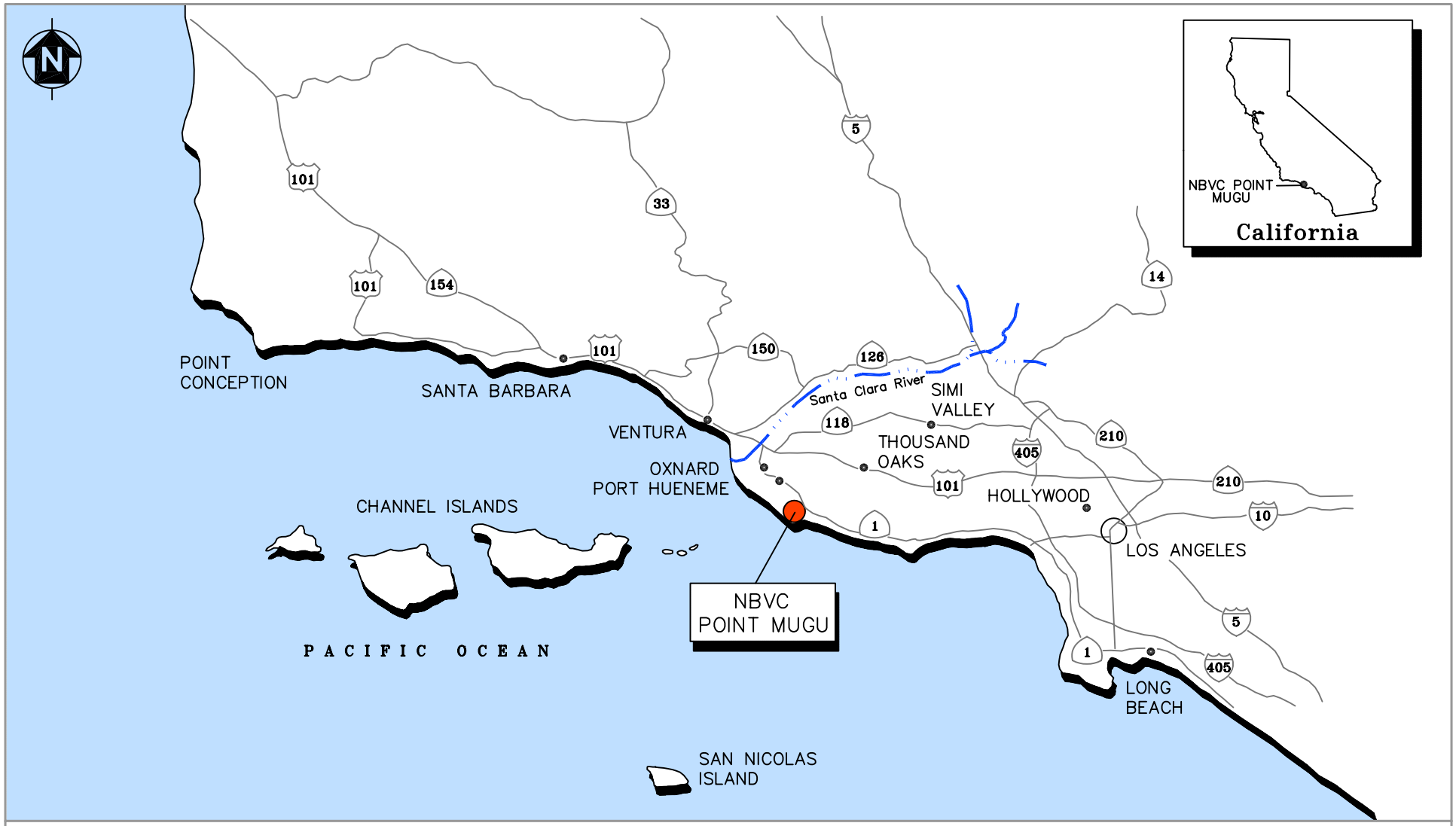
1. Landfill was already closed (in 1975) in accordance with existing requirements.
2. IRP Site 1 has minimal and acceptable human health risk for industrial scenario.
3. IRP Site 1 has minimal and acceptable ecological risk including present and long-term groundwater impacts.
4. Landfill meets Title 27 definitions as a "Closed Site" and "Closed, Abandoned, or Inactive (CAI) Unit."
5. Recommended Action: Maintain successful closure at IRP Site 1.

Section 4.0 summarizes the evaluation of alternatives and, based on the comparative analysis, recommends a preferred action for the site.

Section 5.0 provides references for the documents cited in the FS.

1.2 BACKGROUND INFORMATION

NBVC Point Mugu is located in Ventura County, California, about 50 miles northwest of Los Angeles (Figure 1-2). It is bordered by Highway 1 on the north and east, by the Pacific Ocean on the south and west, and by the Ventura County Game Reserve on the west and northwest, as shown in Figure 1-3.



10 0 10 20
Scale In Miles

LEGEND

NBVC NAVAL BASE VENTURA COUNTY

Source: Tetra Tech 2000

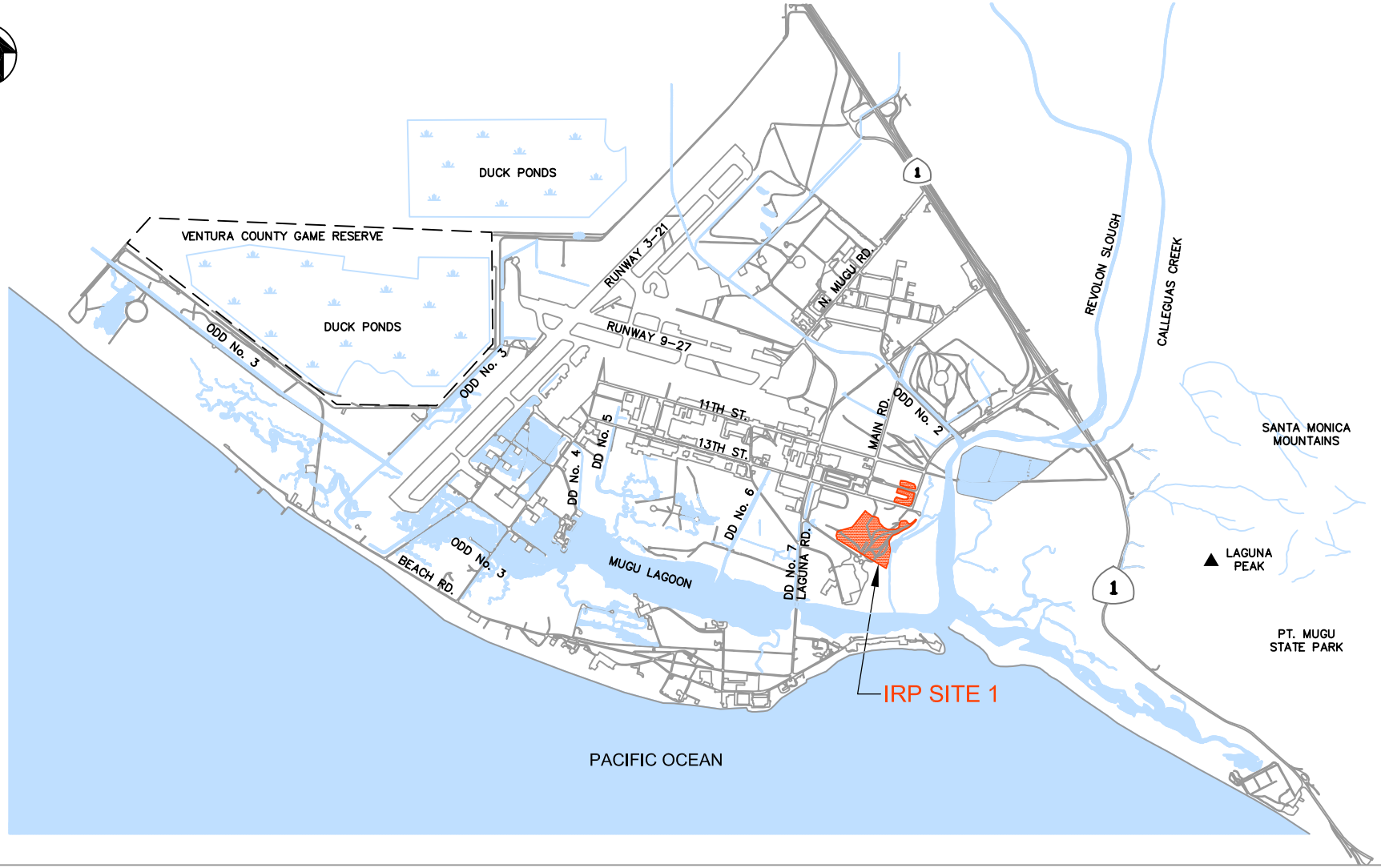
Tetra Tech EM Inc.

NBVC POINT MUGU, CALIFORNIA
U.S. Navy Southwest Division, NAVFAC, San Diego

FIGURE 1-2
VICINITY MAP

Revised FS IRP Site 1
DS.A007.10571

2004-02-05 R:\Navy\Point Mugu\cto-368\ FIG 1-2.dwg TtEMI-SA deborah.ford



LEGEND

- INSTALLATION RESTORATION PROGRAM (IRP) SITE 1
- ODD — OXNARD DRAINAGE DITCH
- DD — DRAINAGE DITCH
- WATER
- BUILDING / SURFACE IMPROVEMENT

Source: Tetra Tech 2000, 2001a

1750' 0 1750' 3500'

Scale: 1" = 3500'

Tetra Tech EM Inc.

NBVC POINT MUGU, CALIFORNIA
U.S. Navy Southwest Division, NAVFAC, San Diego

FIGURE 1-3
SITE LOCATION

Revised FS IRP Site 1
DS.A007.10571

2004-02-05 R:\Navy\Point Mugu\cto-368\ FIG 1-3.dwg TtEMI-SA deborah.ford

The Navy established temporary operations at Point Mugu in 1944, and has conducted operations there since 1945. In 1946, the Naval Air Missile Test Center was commissioned at Point Mugu, and in 1949, the U.S. Naval Air Station was commissioned at this location. The Pacific Missile Test Range was established in 1957, and was renamed the Pacific Missile Test Center in the mid-1970s. In 1993, the names were revised again: the Pacific Missile Test Center became the Naval Air Warfare Center Weapons Division; and the U.S. Naval Air Station became the Naval Air Weapons Station (NAWS). In 1998, NAWS Point Mugu merged with Navy administrative activities at Port Hueneme, and the base was renamed Naval Base Ventura County.

1.2.1 Site Description

This section provides a site description of; surface features at NBVC Point Mugu; a summary of various geophysical surveys performed; and sections detailing leachate, geology and general hydrogeology, hydraulic relationship between aquifers, surface water hydrology and landfill gas condensate.

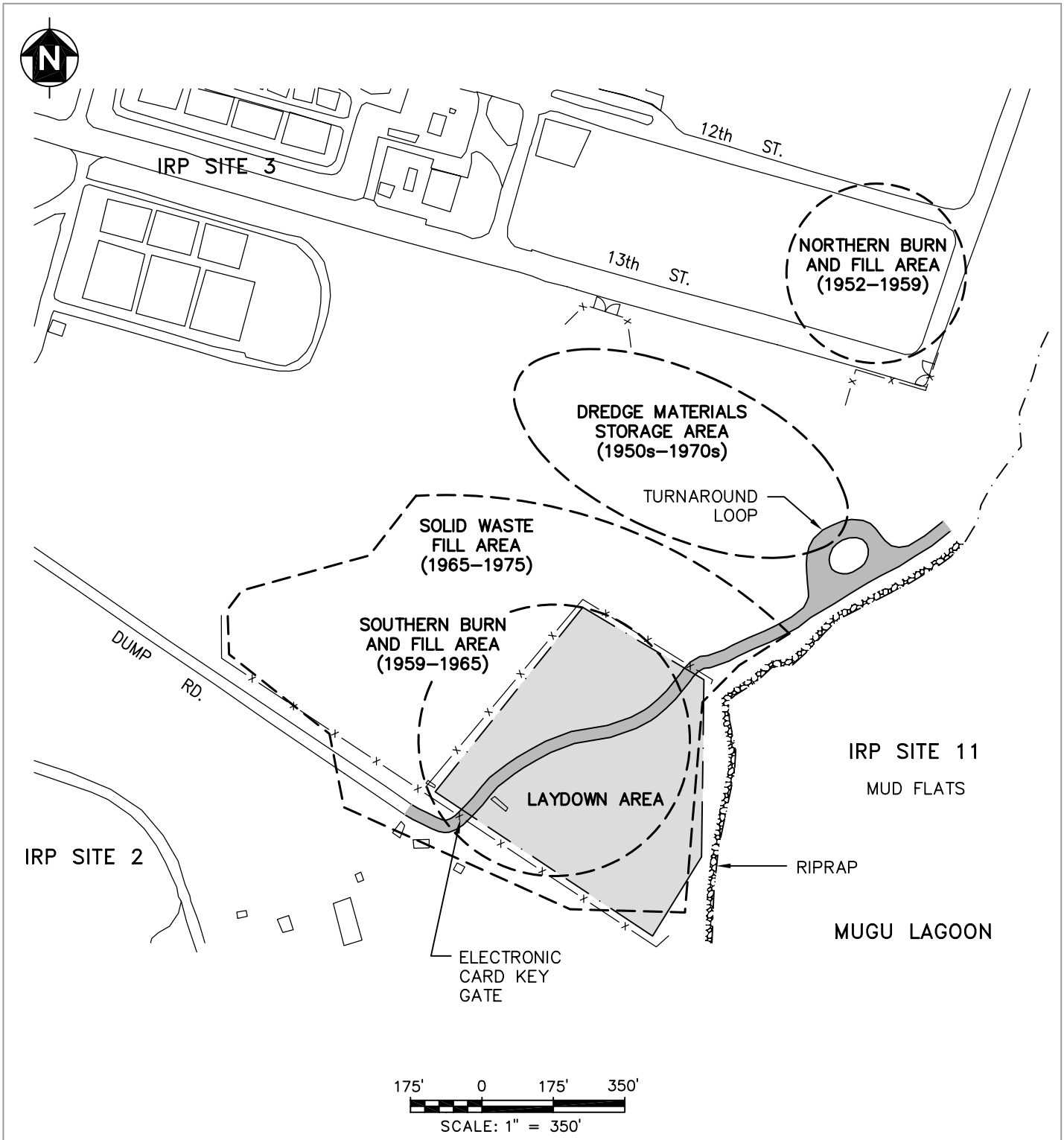
1.2.1.1 Surface Features

IRP Site 1 is a former landfill area located in the southeastern portion of NBVC Point Mugu (Figure 1-4). The site is located south of 12th Street, east and southeast of the Fuel Farm, and north of Dump Road. The eastern part of the site is adjacent to Mugu Lagoon, near the mouth of Calleguas Creek. The former landfill area is divided into four areas, the Northern Burn and Fill Area, the Southern Burn and Fill Area, the Solid Waste Fill Area, and the Dredge Materials Storage Area (Figure 1-4).

The Northern Burn and Fill Area comprises about 6 acres located between 12th and 13th streets. The 19-acre Solid Waste Fill Area is located south of the Northern Burn and Fill Area between Dump Road and 13th Street. The Southern Burn and Fill Area is included in the Solid Waste Fill Area. Non-waste dredge materials from Mugu Lagoon and Calleguas Creek are stored just north of the Solid Waste Fill Area and south of 13th street in the Dredge Materials Storage Area.

The eastern boundary of the site, adjacent to the lagoon, was partially contained by a berm composed of rubble and dredged material. This material was, however, subject to erosion by tides and flooding of Calleguas Creek. To correct this problem, a removal action was conducted in 1997 to minimize erosion on the landfill edge. During the removal action, about 7 acres of the site were graded and covered with a surface of bituminous asphalt overlain by pebble, also known as “chip seal” (Figure 1-4). This new surface is used as a laydown area.

A riprap wall was constructed at the site to minimize further erosion of the shoreline and to prevent transport of landfill materials into the lagoon. An asphalt road provides all-weather access from Dump Road to the riprap wall and laydown area. Fencing restricts site access along Dump Road, at the corner of Las Posas Road and 13th Street and at a dirt road entrance to the site on 13th Street. Fencing also borders the laydown area. The entrance to the laydown area from Dump Road is gated.



LEGEND

- DISPOSAL/SOURCE AREA BOUNDARY
- FENCE
- DOUBLE SWING GATE
- LAYDOWN AREA BOUNDARY
- ACCESS ROAD
- RIPRAP
- IRP INSTALLATION RESTORATION PROGRAM

Source: Tetra Tech 2001a

Tetra Tech EM Inc.

NBVC POINT MUGU, CALIFORNIA
U.S. Navy Southwest Division, NAVFAC, San Diego

FIGURE 1-4
DISPOSAL/STORAGE AREAS

Revised FS IRP Site 1
DS.A007.10571

2004–02–05 R:\Navy\Point Mugu\cto–368\ FIG 1–4.dwg TtEMI–SA deborah.ford

IRP Site 1 is unoccupied, except for storage boxes and equipment maintained on the asphalt-paved laydown area. Parts of the surface of the site not covered by the laydown area are hummocky (mounded) because of the presence of piles of soil or metal and construction debris.

Habitats at IRP Site 1 include normative grassland and scrub on the surface surrounding the laydown area. Although much of the site consists of unvegetated roadways and the laydown area, parts of the site are vegetated with grasses, iceplant, trees, and low shrubs. This vegetation provides limited habitat for small mammals and birds. In addition, surface debris, which is often covered with iceplant, provides cover for these animal species.

The area directly east of the landfill area is composed of intertidal mudflats and low marsh. This area is subject to tidal movements and flows from Calleguas Creek, and thus is more contiguous with, and representative of, the lagoon.

1.2.1.2 Geophysical Survey

A geophysical survey of IRP Site 1 (Montgomery-Watson Americas and Terra Soft 1993) showed varying degrees of cover material over the disposal areas (Figure 1-5). Surface cover consisting of sandy soil and iceplant is present in the northern two-thirds of the site, and surface debris is minimal. The surface surrounding the laydown area of the landfill is uneven and hummocky, particularly in the Northern Burn and Fill Area, north of 13th Street, and on the southeastern part of the site. Sand dunes are present on the western part of the site. Prior to construction of the laydown area, a large amount of surface debris was present in the south-central and eastern parts of the site. Dense vegetation, including trees, large shrubs, and heavy brush, is present in the southern part of the landfill. Geophysical measurements were not collected at every grid point because of obstruction by dense vegetation.

Geophysical data were used to generate magnetics and terrain conductivity maps, which were then used to help define the landfill material and accumulated objects that may contain iron. Only large accumulations of metal and construction debris were detected because the grid spacing was 25 feet laterally. Figure 1-5 shows the approximate boundaries of the areas with major geophysical anomalies at IRP Site 1. Boundaries where data coverage is limited are shown by dashed lines. The boundaries of the northernmost area, located south of 12th Street and east of Main Street are not clearly defined.

Magnetic Survey

The results of the magnetic survey show that the disposal of metal and construction debris was concentrated in the areas north of 13th Street and on the southeast part of the site. These results indicate that there is a 600-foot-wide, east-west trending corridor in the center of the site that contains little to no metal debris. These results are consistent with the history of use of this area for liquid wastes and dredged material disposal, as these wastes would be expected to contain little or no metal debris (see Section 1.2.2).

LEGEND

- APPROXIMATE AREA OF MAGNETIC ANOMALIES
- APPROXIMATE AREA OF MAGNETIC AND ELECTROMAGNETIC ANOMALIES
- APPROXIMATE AREA OF ELECTROMAGNETIC ANOMALIES
- SITE 1 BOUNDARY
- CORRIDOR OF LITTLE OR NO METAL DEBRIS
- BOUNDARY IN AREAS OF LIMITED COVERAGE
- MARSH AREA
- IRP INSTALLATION RESTORATION PROGRAM

Source: Tetra Tech 2001a

150' 0 150' 300'

SCALE: 1" = 300'

Tetra Tech EM Inc.

NBVC POINT MUGU, CALIFORNIA
U.S. Navy Southwest Division, NAVFAC, San Diego

FIGURE 1-5
GEOPHYSICAL ANOMALOUS AREAS

Revised FS IRP Site 1
DS.A007.10571

2004-02-05 R:\Navy\Point Mugu\cto-368\ FIG 1-5.dwg TtEMI-SA deborah.ford

In the southeast part of the site, waste materials such as storage tanks, steel boxes, and pipes were visible on the surface and under iceplant cover. The area north of 13th Street also contains a significant amount of metal and construction debris. However, this material is not as visible because of the soil and dense iceplant cover. The results of the magnetic survey show that the southwestern part of the site contains only small, isolated ferrous-metal objects.

Electromagnetic Survey

The electromagnetic survey results delineated anomalies within areas displayed on the magnetic maps. These anomalies are probably due to the presence of segments of piping within the metal debris in the southeastern part of the site, and to the presence of small bodies of water in the area north of 13th Street. The water bodies produce an anomalous result because of the high salt content of the water.

Low-gradient electromagnetic anomalies in the southwestern part of the landfill probably are related to isolated metal objects. In addition to the anomalies corresponding to areas of metallic debris and piping, three broad electromagnetic "highs" are present within the 600-foot corridor traversing the center of the site. These anomalies are within the former dredged material disposal area. They correspond to low-lying areas composed of sand with probable high salt content, which yields an anomalous result.

The geophysical survey confirmed that debris within IRP Site 1 is not evenly distributed. Rather, metal debris disposed of at the site is concentrated in the northern and southeastern parts of the site. The correlation of the survey results to field conditions also reveal that, in general, a delineation of the landfill areas of the site is possible based on topography. Metal debris appears to be concentrated in elevated areas.

However, exceptions to this correlation are found in the western part of the site, where elevated sand dunes contain little metal debris.

The estimated boundaries of the major disposal areas are delineated by the geophysical survey areas containing the major magnetic and electromagnetic anomalies (Figure 1-5). Although these areas occur in the same general geographic locations of the open burn fill areas, the identification of burial trenches or the boundaries of open burn and fill areas were not confirmed from the survey. The presence of surface metal and construction debris, probably from disposal of materials after the original landfilling activities in the 1950s and 1960s, precluded such confirmation.

1.2.1.3 Geology and General Hydrogeology

This section summarizes the geology and hydrogeology of NBVC Point Mugu. A more detailed description is found in Appendix A.

IRP Site 1 is located adjacent to the central basin of Mugu Lagoon, near the current and historic inlet of Calleguas Creek into the lagoon. The site is on a tidal saltwater marsh that was filled

both prior to and during landfilling activities (PRC Environmental Management, Inc. [PRC] and James M. Montgomery, Consulting Engineers, Inc. [JMM] 1993b). Calleguas Creek deposits sand, silt, and clay into Mugu Lagoon as the water velocity of the creek slows upon entering the lagoon.

Soil borings at IRP Site 1 were advanced to a maximum depth of 18 feet bgs. Because of the shallow borings at the site and the variation in elevation across the site due to landfill mounds, detailed lithology for the site exists only for the shallow part of the unconfined aquifer. It consists of fill materials overlying a semicontinuous clay unit and a sand unit comprising interbedded sand and silt. Lithology at depth for IRP Site 1 is shown on the geologic cross-sections of NBVC Point Mugu (Figures 1-6 and 1-7).

A hydrostratigraphic depiction of the aquifers in relation to geologic formations is shown on Figure 1-8. A 3-dimensional depiction of the aquifers is shown on Figure A-10 in Appendix A. The figures show that the unconfined aquifer extends to an approximate depth of 120 feet below ground surface (bgs); the clay cap aquitard is present from about 120 to 145 feet bgs; the Oxnard aquifer extends from about 145 to 225 feet bgs; an aquitard from about 225 to 270 feet bgs separates the Oxnard aquifer from the Mugu aquifer; the Mugu aquifer extends from about 270 to 290 feet bgs and 335 to 370 feet bgs; and a fine-grained lens is present between about 290 feet and 335 feet bgs. An aquitard from about 370 feet to 400 feet bgs separates the Mugu aquifer from the Fox Canyon and Grimes Canyon aquifers, which are encountered below 400 feet bgs. The depth of the Fox Canyon and Grimes Canyon aquifer system could not be determined.

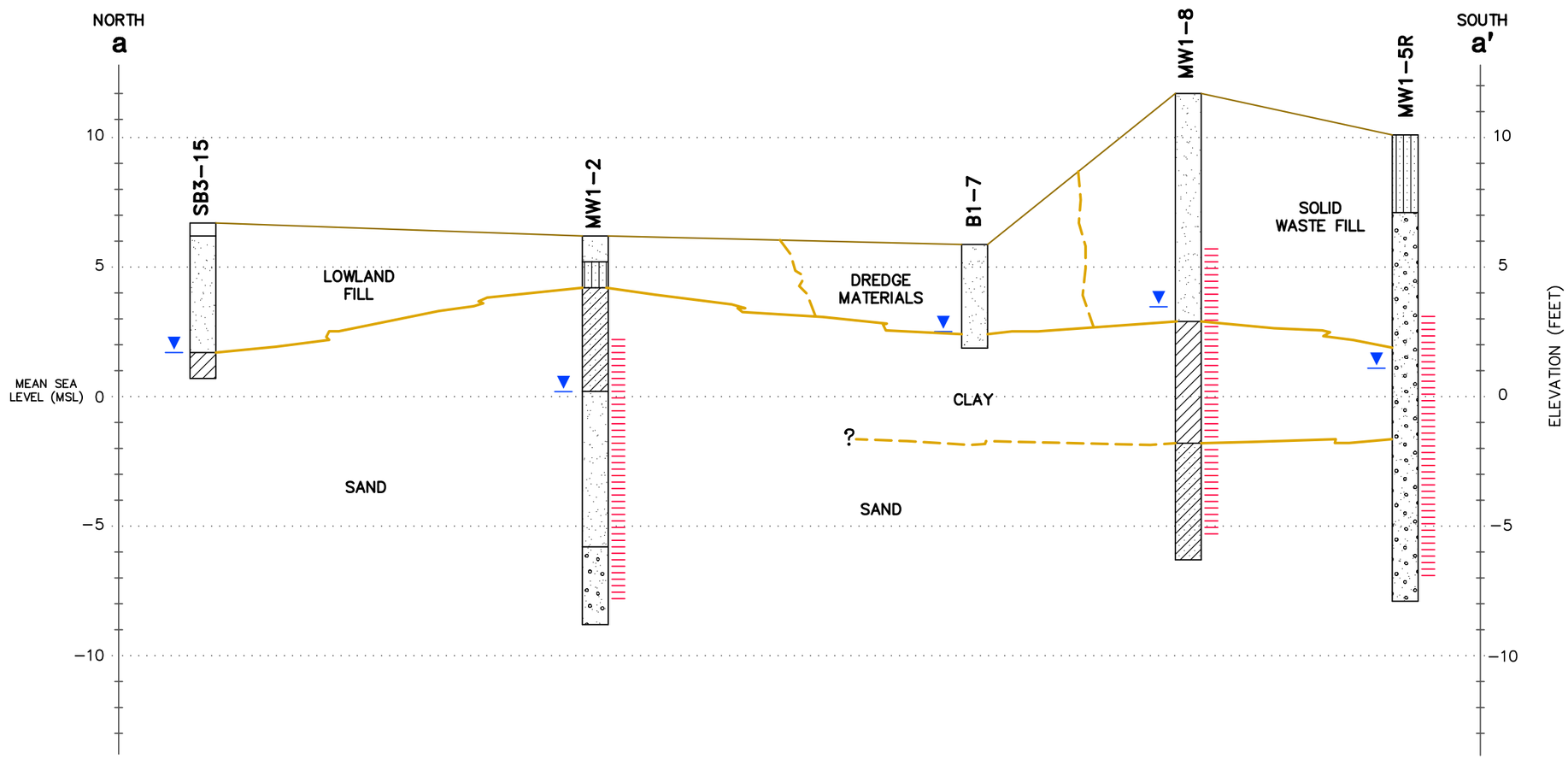
Fill materials at IRP Site 1 include solid waste fill, dredged material, and lowland fill that consist of soil scraped from other areas of NBVC. The solid waste fill is found in the southeastern and northeastern parts of the site. It was identified by the presence of wood, metal, cloth, and household debris encountered during drilling and sampling activities.

The northern part of the site was previously identified as open burn fill (See Section 1.2.2 [PRC and JMM 1993b]), but was found to contain large amounts of solid waste fill debris. The soils that were intermixed with the solid waste fill materials included sand with varying amounts of silt and clay. The depth of the solid waste fill varies across the site. It ranges from a maximum of about 9 feet bgs to a minimum of about 2 feet bgs.

Lowland marshy and tidal areas have been filled during past construction. Lowland fill is present in the northern and western parts of the site. Lowland fill includes sand and silt. It was differentiated from native soil by change in sand type and by the presence of angular gravel, laminations and iron staining.

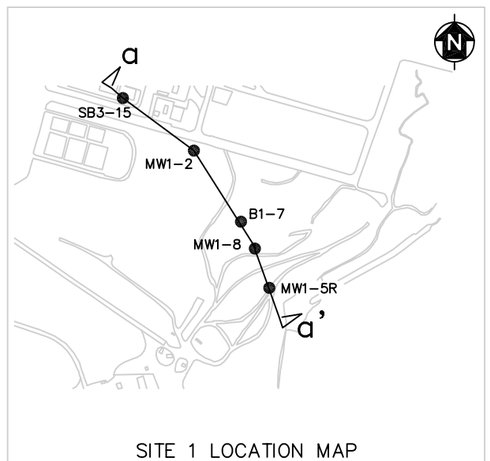
A clay unit directly underlies a portion of the solid waste fill, dredged material, and lowland fill. The clay unit extends beneath the fill along the eastern edge of IRP Site 1. It thins from south to north, and appears to be in lateral contact with the sand unit beneath the site. The clay unit ranges in thickness from 0.5 feet to 11 feet. It consists primarily of clay, with some thin sand and silt lenses (Figures 1-6 and 1-7). The clay is interpreted as representing the change in depositional lithology between the tidal saltwater marsh areas and the uplands that currently

surround Mugu Lagoon. The clay unit may be a local hydrogeologic barrier in the uppermost part of the unconfined aquifer.

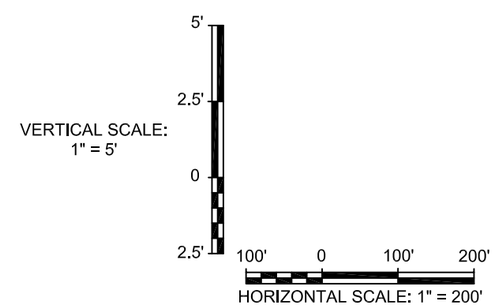


LEGEND

- SW - WELL-GRADED SANDS
- SP - POORLY-GRADED SANDS
- SM - SILTY SANDS
- SC - CLAYEY SANDS
- CL - SANDY CLAYS, SILTY CLAYS
- CONTACT
- INFERRED CONTACT
- APPROXIMATE WATER LEVEL MEASURED DURING DRILLING ACTIVITIES
- SB13-15 MONITORING WELL
- MONITORING WELL SCREENED INTERVAL



SITE 1 LOCATION MAP



VERTICAL EXAGGERATION IS 40X.

Source: Tetra Tech 2001a

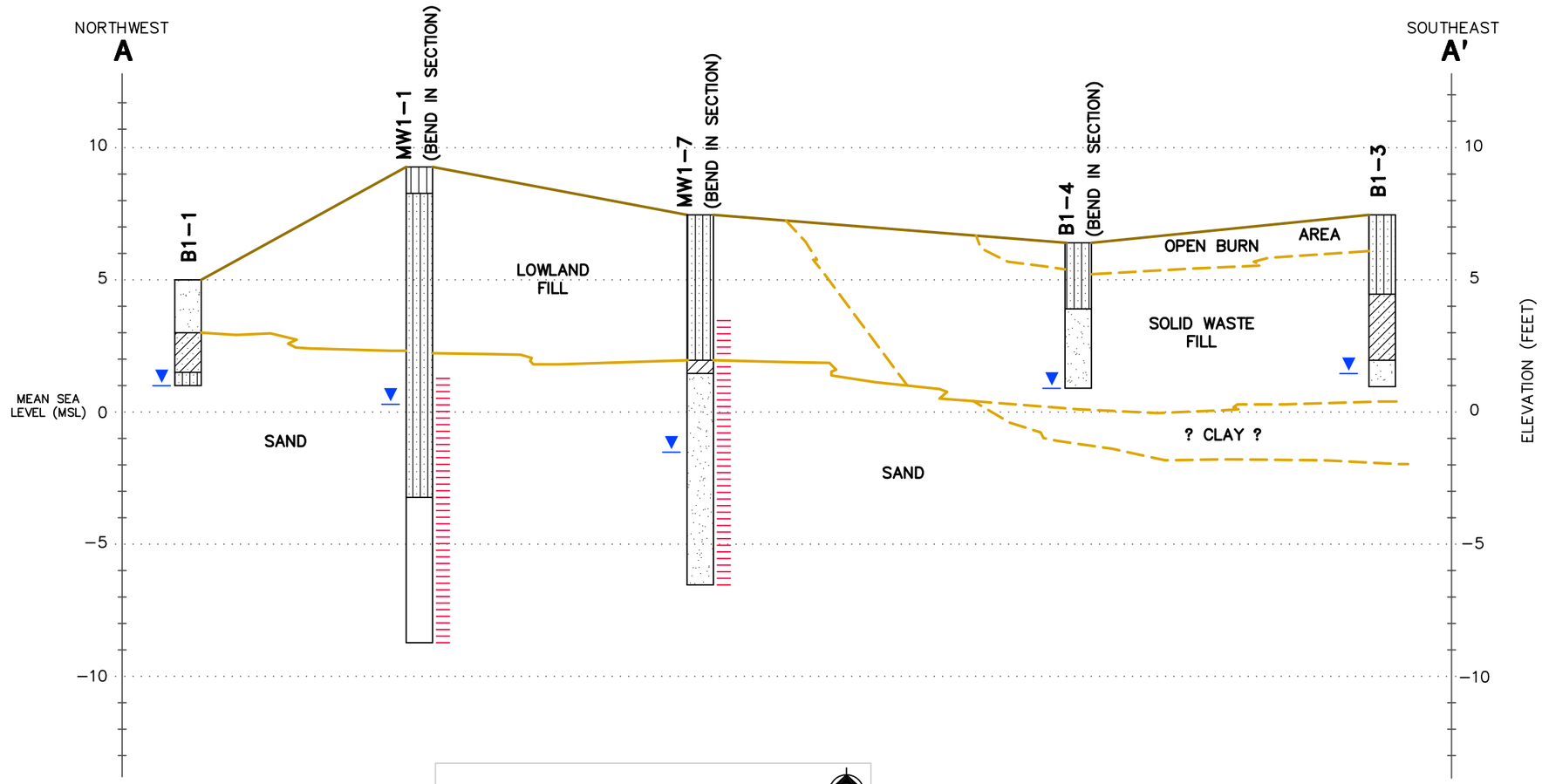
Tetra Tech EM Inc.

NBVC POINT MUGU, CALIFORNIA
U.S. Navy Southwest Division, NAVFAC, San Diego

FIGURE 1-6
GEOLOGICAL
CROSS-SECTION a-a'

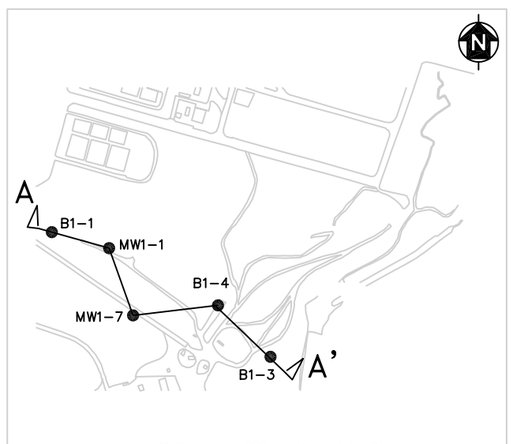
Revised FS IRP Site 1
DS.A007.10571

2004-02-05 R:\Navy\Point Mugu\cto-368\ FIG 1-6.dwg TtEMI-SA deborah.ford



LEGEND

- SP - POORLY-GRADED SANDS
- SM - SILTY SANDS
- SC - CLAYEY SANDS
- ML - SANDY SILTS, CLAYEY SILTS
- CL - SANDY CLAYS, SILTY CLAYS
- CONTACT
- INFERRED CONTACT
- APPROXIMATE WATER LEVEL MEASURED DURING DRILLING ACTIVITIES
- MW1-1 MONITORING WELL
- MONITORING WELL SCREENED INTERVAL



SITE 1 LOCATION MAP

VERTICAL SCALE: 1" = 5'

5' 2.5' 0 2.5'

100' 0 100' 200'

HORIZONTAL SCALE: 1" = 200'

VERTICAL EXAGGERATION IS 40X.

Source: Tetra Tech 2001a

Tetra Tech EM Inc.

NBVC POINT MUGU, CALIFORNIA
U.S. Navy Southwest Division, NAVFAC, San Diego

FIGURE 1-7
GEOLOGICAL
CROSS-SECTION A-A'

Revised FS IRP Site 1
DS.A007.10571

2004-02-05 R:\Navy\Point Mugu\cto-368\ FIG 1-7.dwg TtEMI-SA deborah.ford

Age			Description of Hydrogeologic Units		Corresponding Stratigraphic Units
QUATERNARY	HOLOCENE		SHALLOW UNCONFINED AQUIFER. Referred to as the "semiperched aquifer." Interbedded layers and lenses of sand, gravel silt, and clay; 85 to 135 feet thick.		ALLUVIUM (Qal)
			"CLAY CAP" AQUITARD. Silt, silty clay, and clay with some lenses of sand and gravel; 20 to 45 feet thick.		
	PLEISTOCENE	UPPER	OXNARD AQUIFER. Sand, gravel, and cobbles with lenses of clay, silty clay, and silt; 50 to 100 feet thick.	UPPER AQUIFER	
			AQUITARD. Silt and clay with lenses of sand and gravel 50 to 100 feet thick.		
			MUGU AQUIFER. Sand and gravel with interbedded silt and clay 25 to 250 feet thick.		TERRACE DEPOSITS
		LOWER	AQUITARD. Silt and clay with some sand; 50 to 300 feet thick.	LOWER AQUIFER	
			HUENEME AQUIFER (absent at NBVC Point Mugu), FOX CANYON AQUIFER, and GRIMES CANYON AQUIFER. Marine sand and gravel; unknown thickness.		SAN PEDRO FORMATION (Qsp)
					SANTA BARBARA FORMATION (PQsb)
TERTIARY	PLIOCENE		Undifferentiated.		PICO FORMATION (Pp)

NOTE: Shaded cells represent aquitards for clarity.

Tetra Tech EM Inc.

NBVC POINT MUGU, CALIFORNIA
U.S. Navy Southwest Division, NAVFAC, San Diego

FIGURE 1-8
HYDROSTRATIGRAPHY OF NBVC POINT MUGU

Revised FS IRP Site 1
DS.A007.10571

Source: Tetra Tech 2000

R:\Navy\Pt. Mugu\cot-368\Fig 1-8.dsf DN deborah.ford

All geologic cross-sections show a sand unit laterally continuous across IRP Site 1 and in direct contact with the clay unit across the eastern edge of the site. It is also in direct contact with the lowland fill. The solid waste fill area may also be in direct contact with the sand unit. However, because of lack of lithologic information, the edge of the western clay unit has not been determined. The total depth of the sand unit also has also not been determined.

1.2.1.4 Upper Aquifer Hydrogeology

IRP Site 1 is located at the southeast end of the developed part of NBVC Point Mugu, north of Mugu Lagoon and immediately west of the mudflats bordering Calleguas Creek. Groundwater monitoring wells are located at the site at the top of the semiperched aquifer, which extends to a depth of about 120 feet bgs near the site.

Groundwater information collected for IRP Site 1 included groundwater elevations, groundwater gradient, hydraulic conductivity, and groundwater flow velocity. In addition, geochemistry and stable isotope data were collected for NBVC Point Mugu during the RI for groundwater (Tetra Tech 2004).

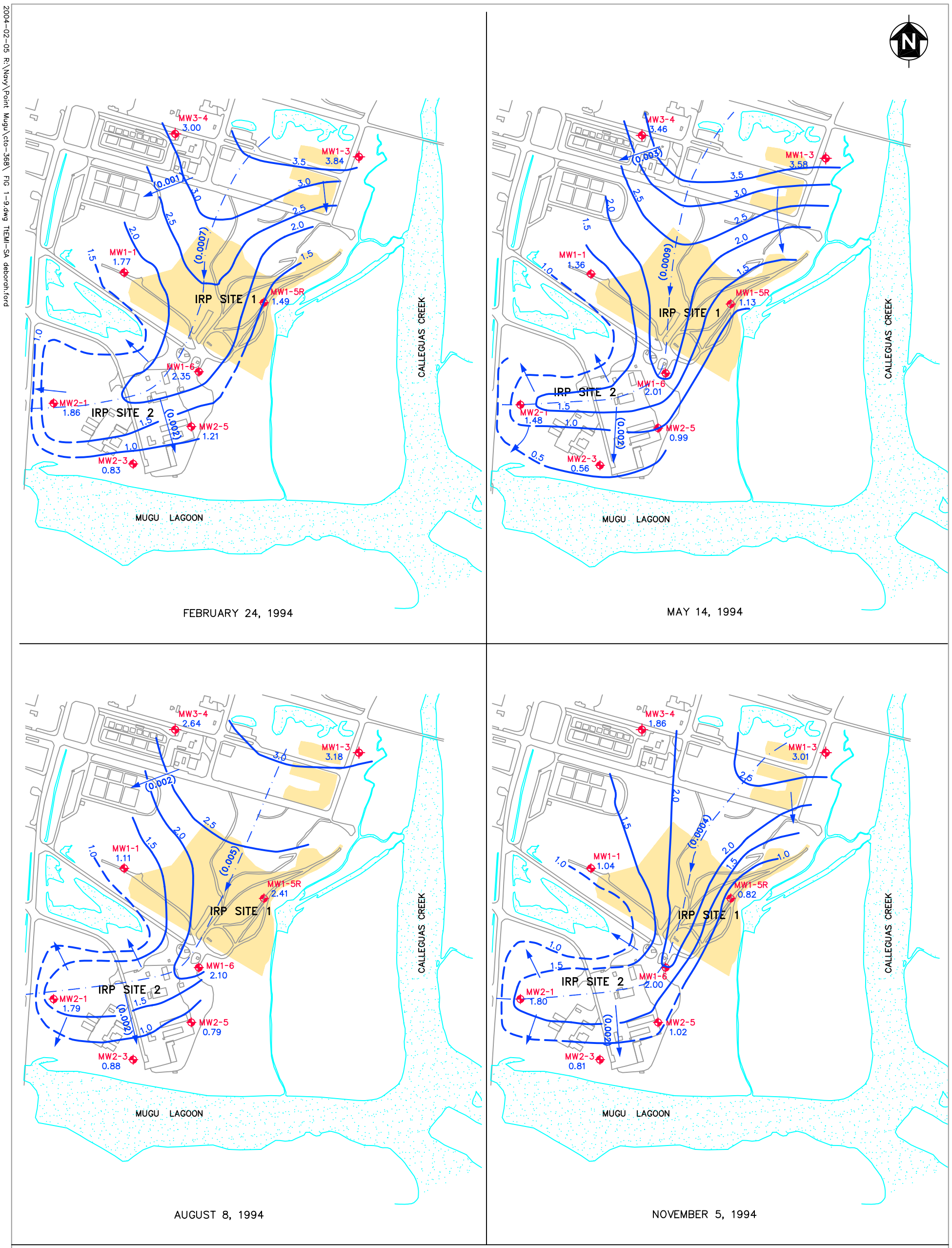
Aquifer Material

The aquifer material at IRP Site 1 includes solid waste fill, lowland fill, clay, and sand. The solid waste fill and lowland fill lie directly on top of an assumed clay unit in the northern part of the site and on top of the sand unit in the southern part of the site. The clay unit separates the solid waste fill from the sand unit in the northern and southern part of the site.

Groundwater Surface

Figure 1-9 shows groundwater surface contour maps for four quarters of groundwater elevation measurements. The groundwater surface contours are based on the average water levels measured. The groundwater surface has a general slope to the southwest. The slope is away from a groundwater divide that trends in an approximate southwest direction across the site, and toward surface water bodies (Mugu Lagoon to the southeast and tidal ponds to the west). The groundwater surface was interpreted based on average water levels corrected for tidal influences. The elevation contours were constructed using the assumption that the Mugu Lagoon shoreline forms a constant head boundary to the southeast.

Figure 1-9 also shows how groundwater flows across IRP Site 1 and how it is influenced by the surrounding surface water features. In general, groundwater at IRP Site 1 flows from the north-northeast and discharges to the southeast along the edge of the site, into the mudflats bordering Mugu Lagoon. Along the northwestern edge of the site, groundwater flows to the southwest toward tidal ponds and the Laguna Road drainage ditch (DD) 7. Thus, an approximate north-south groundwater divide extends through IRP Site 1. Along this divide, groundwater would have its lowest relative velocity. The position of the groundwater divide and the slope of the groundwater surface vary with seasonal groundwater elevations (Figure 1-9).



LEGEND

MW2-1 1.79 — MONITORING WELL LOCATION AND GROUNDWATER ELEVATION (FEET ABOVE MEAN SEA LEVEL)

GROUNDWATER CONTOUR (0.5' INTERVAL), DASHED WHERE INFERRED

(0.002) — APPROXIMATE GROUNDWATER FLOW DIRECTION WITH HYDRAULIC GRADIENT IN PARENTHESES

WATER

INSTALLATION RESTORATION PROGRAM (IRP) SITE 1

400' 0 400' 1

SCALE: 1" = 800'

Source: Tetra Tech 2001a

Tetra Tech EM Inc.

NBVC POINT MUGU, CALIFORNIA
U.S. Navy Southwest Division, NAVFAC, San Diego

FIGURE 1-9
SITES 1 AND 2
GROUNDWATER SURFACE CONTOURS

Revised FS IRP Site 1
DS.A007.10571

2004-02-05 R:\Navy\Point Mugu\cto-368\ FIG 1-9.dwg TtEMI-SA deborah.ford

The gradient of the groundwater surface that is parallel to the groundwater divide ranges from 0.0004 to 0.005. The gradient of the groundwater surface that discharges to surface water varies from 0.001 to 0.003, west of IRP Site 1. The RI for groundwater (Tetra Tech 2004) confirms the 1994 groundwater surface configuration and behavior presented on Figure 1-9 with quarterly sampling results from 1998 and 1999, although these data are from different and fewer monitoring wells near IRP Site 1. The 1994 data provides a better indication of IRP Site 1 conditions for this discussion.

Three monitoring wells (MW1-5R, MW1-8, and MW1-9) are screened across the clay unit at IRP Site 1 are open to the solid waste fill and the sand unit aquifer. Two monitoring wells (MW1-3 and MW1-4) on the site nearly penetrate the entire clay unit. Water levels from these wells may be composite water levels representing contributions from groundwater from both above and within the clay unit. Thus, the groundwater elevations in these wells may not be representative of semi-perched aquifer conditions.

Groundwater elevations are tidally influenced at IRP Site 1. Groundwater elevations that have been corrected for tidal variation are presented in Table 1-1. The depth to groundwater in the uppermost water-bearing zone at IRP Site 1 varies between about 2.5 and 9.5 feet bgs, depending on the location, seasonal variations, and tidal fluctuations.

TABLE 1-1. GROUNDWATER ELEVATIONS CORRECTED FOR TIDAL VARIATION AT IRP SITE 1

		First Quarter 1994		Second Quarter 1994	Third Quarter 1994	Fourth Quarter 1994
Well No.	February 15 5:32 a.m. ± 7 min.	February 24 2:17 p.m. ± 7 min.	February 26 6:02 p.m. ± 7 min.	May 14 1:15 a.m. ± 5 min.	August 8 3:31 p.m. ± 7 min.	November 5 10:12 a.m. ± 7 min.
MW1-1	1.34	1.77	1.73	1.36	1.11	1.04
MW1-3	3.24	3.84	3.82	3.58	3.18	3.01
MW1-5R	1.04	1.49	1.49	1.13	2.41	0.82
MW1-6	2.02	2.35	2.36	2.01	2.10	2.00

Notes: Elevation in feet; datum of mean sea level. Source: Tetra Tech (2000)

Hydraulic gradients and flow directions were determined from groundwater elevations measured during the tidal influence study. The tidal influence data used to calculate the hydraulic gradients and flow directions are presented in Table 1-2.

TABLE 1-2. TIDAL INFLUENCE DATA FOR IRP SITE 1

Well No.	24-Hour High Groundwater Elevation	24-Hour Low Groundwater Elevation	Groundwater Elevation Fluctuation
MW1-1	1.18	1.06	0.12
MW1-3	3.62	3.02	0.60
MW1-5R	2.89	2.28	0.61
MW1-6	2.30	2.00	0.30

Notes: Elevation in feet; datum of mean sea level. Source: Tetra Tech (2000)

Hydraulic Conductivity

Hydraulic conductivities for the semiperched aquifer are presented in Table 1-3. The conductivities were measured by slug testing (Tetra Tech 2004). These measured conductivities are consistent with those expected for sand and silty sand (Freeze and Cherry 1979).

TABLE 1-3. HYDRAULIC CONDUCTIVITIES FOR IRP SITE 1

Well No.	Hydraulic Conductivity (inch/second)	
	Rising Head Test	Falling Head Test
MW1-5R	0.009	0.014
MW1-8	0.004	0.011
MW1-9	0.014	0.009

Source: Tetra Tech (2000)

Horizontal groundwater flow velocities were calculated using the data for hydraulic gradient and hydraulic conductivity. Groundwater flow velocities, calculated for three parts of IRP Site 1, are presented in Table 1-4.

TABLE 1-4. GROUNDWATER FLOW VELOCITIES AT IRP SITE 1

Site	Flow Velocity (feet/year)		
	Minimum	Maximum	Average
1 (northeast portion)	136	862	517
1 (central portion)	16	103	62
1 (western portion)	54	305	207

Source: Tetra Tech (2000)

Major Ion Chemistry

The groundwater at NBVC Point Mugu exhibits a sodium-chloride type chemistry that is characteristic of seawater intrusion (Hem 1992). The average total dissolved solids (TDS) concentration at IRP Site 1 is 19,000 milligrams per liter (mg/L) (Tetra Tech 2004).

of groundwater (EPA 1986). Both guidance documents classify this water unsuitable as a source of domestic and municipal supply.

The landfill at IRP Site 1 is not considered the source of the TDS levels in groundwater at the site because mass balance considerations rule out point-source contamination as a major contributor to the high TDS concentrations observed across NBVC (McBean, Rovers, and Farquhar 1995). Instead, the TDS values at IRP Site 1 are consistent with that of seawater intrusion.

1.2.1.5 Hydraulic Relationship between Aquifers

The unconfined aquifer and the aquifers of the upper and lower aquifer systems are separated by aquitards that are leaky (Page 1963). However, groundwater flow between the aquifers is probably minimal. The layering of fine-grained, relatively impermeable sediments with the coarser-grained, permeable sediments restricts vertical flow within the aquifer system.

Originally, the groundwater levels in the upper aquifer system were higher than the levels in the unconfined aquifer, and there was artesian flow in the upper aquifer system wells (California Department of Water Resources [DWR] 1965). Excessive pumping of upper aquifer system wells lowered the potentiometric surface such that the wells in the Oxnard aquifer no longer flowed freely. However, new facilities and management practices introduced in the 1980s and 1990s have restored artesian flow conditions in lower aquifer system wells.

The groundwater potentiometric levels rise seasonally in lower aquifer system wells, and water levels approach sea level in many areas. Wide annual fluctuations in water levels that result from the stresses of seasonal pumping confirm the relatively low permeability of the lower aquifer system (United Water Conservation District 1998).

Although water levels in the upper aquifer system have declined, they are still higher than the level of the "clay cap" confining layer, and there is an upward vertical gradient between the upper aquifer system and the unconfined aquifer (Fugro-McClelland 1991).

The aquitard that separates the unconfined aquifer from the Oxnard aquifer is likely to be both laterally and vertically discontinuous in some areas. Therefore, the unconfined and the Oxnard aquifers may be in hydraulic communication. However, data on water level, geochemistry, and stable isotopes, as well as hydraulic conductivity, collected during the RI for groundwater (Tetra Tech 2004) showed reasonable hydraulic separation between the aquifers. The hydraulic conductivity values, for example, were on the order of 1×10^{-7} centimeters per second (cm/sec).

1.2.1.6 Surface Water Hydrology

This section describes the surface water characteristics at IRP Site 1, including identification of erosion channels on the landfill surface and erosion effects of lagoon currents and wave actions on the landfill embankment.

Hydrologic Setting

Originally, IRP Site 1 was a saltwater tidal marsh. Filling was conducted prior to landfill development at the site. Surface water at the site includes a small east-west-trending ditch that drains the northernmost part of the site. It runs from the north side of 13th Street through a culvert under Las Posas Road and to the lagoon. This ditch is connected to the lagoon, and the water is tidally influenced. In addition, two areas of tidal ponding occur directly west of IRP Site 1 in the areas north of Dump Road and between Dump Road and South Mugu Road, and directly south of South Mugu Road. There are extensive mudflats and a network of tidal creek channels east of the site.

Surface Water Drainage

According to the NBVC Point Mugu stormwater pollution prevention plan (PRC and JMM 1993a), the majority of IRP Site 1 lies within drainage area (DA) 13 (see Figure 1-10). The areal extent of drainage area DA 13 is 155 acres. Within DA 13, surface water runoff flows east toward the lagoon, or through marshes or small drainage ditches. Field observations, topographic maps, and aerial photographs have shown no obvious erosion channels on the site surface that lead to nearby marshes, drainage ditches, or mudflats.

Embankment Erosion

The average daily wave action at IRP Site 1 is not a significant factor in embankment erosion. The narrow inlet to the ocean on the southern side of the lagoon acts to reduce ocean swells within the lagoon. The swells hit the barrier beach and rock wall revetments built to protect structures located south of the western arm. In addition, under normal conditions, the shallow lagoon does not have enough fetch for significant wind-generated waves to form.

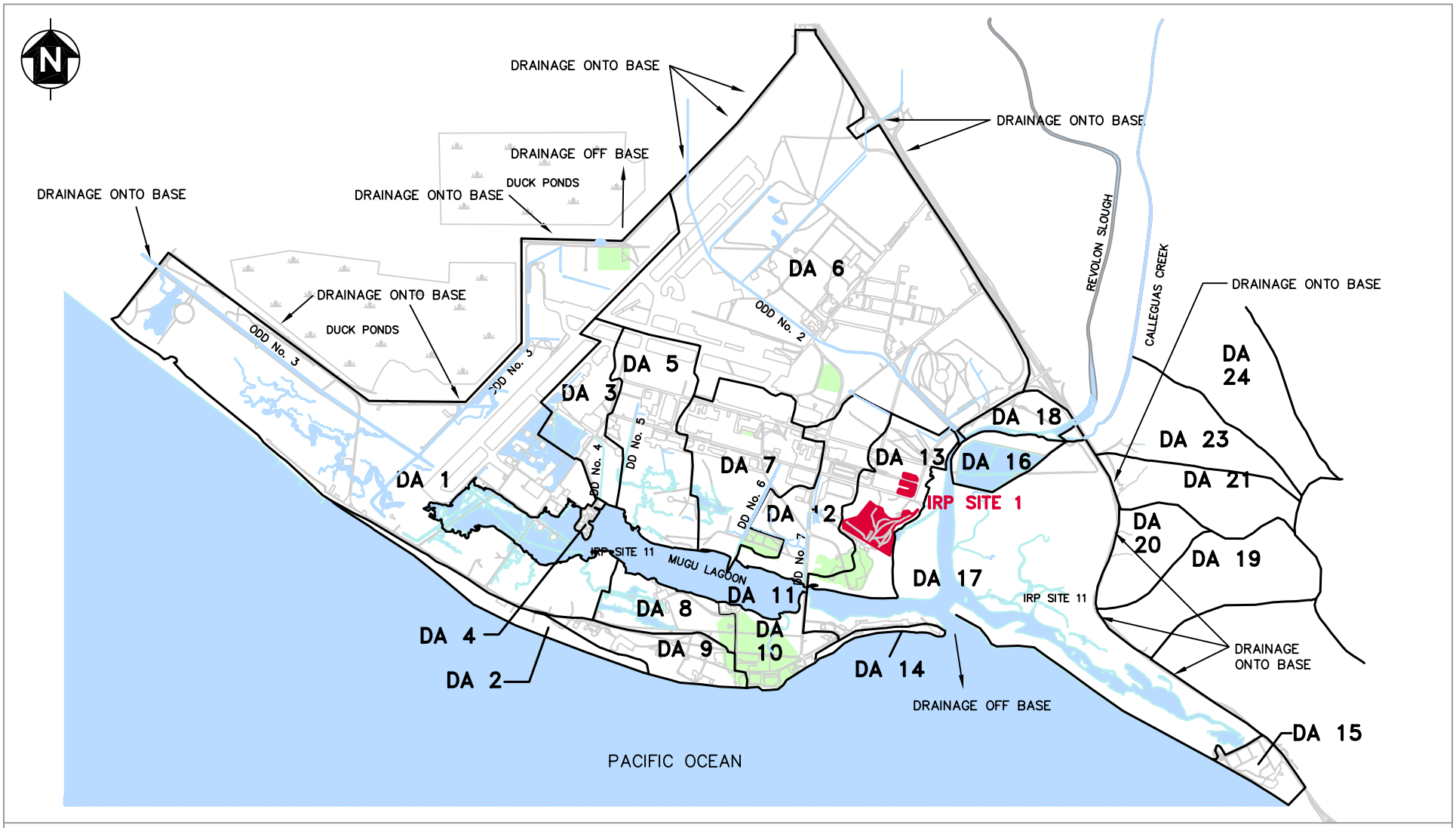
The eastern side of IRP Site 1 once was subject to erosion by rain, creek currents, and small waves in the lagoon. Erosion of the embankment from surface water runoff exposed debris and dredged material. Erosion was most significant during storms, during spring high tides, and after significant rainfall, when discharge from Calleguas Creek was high. However, during the 1997 removal action at IRP Site 1, the site was graded and a riprap wall was constructed in order to minimize erosion. The eastern edge of IRP Site 2 is within DA 17 and is impacted directly by Calleguas Creek.

1.2.1.7 Leachate

Leachate may be generated by contact of wastes in a landfill with moisture that enters the landfill from precipitation, and, for landfills with wastes below the water table, from the groundwater. The IRP Site 1 landfill was closed in 1975. There were no requirements for a liner or leachate collection and removal system at that time. Some portions of the landfill are in contact with groundwater. Groundwater monitoring data have not indicated there is significant generation of leachate from the Site 1 landfill.

The average groundwater chloride concentration at Site 1 is 9,510 mg/L. This concentration is elevated far beyond the expected impact of landfill leachate on groundwater. Although some landfills may generate leachate with peak chloride concentrations up to 2,500 mg/L, these concentrations do not take into account mixing and dilution in groundwater, which would reduce the actual groundwater impact by an order of magnitude. Also, chloride leachate concentrations decline rapidly with the age of a landfill and are expected to diminish to less than 1,000 mg/L within a few years of final waste disposal (McBean and others 1995). Therefore, the total dissolved solids (TDS) values detected are indicative of seawater intrusion.

The semi-perched aquifer underlying the Site 1 landfill has poor quality groundwater with high TDS induced by salt water intrusion. Several metals sporadically exceed ambient water quality criteria (AWQC) but are less than literature effects levels for ecological receptors. Moreover, locations with the greatest chemical concentrations are beneath paved surfaces, thereby eliminating a complete exposure pathway. Concentrations in the vegetated upland areas are considerably lower. In addition, due to the physicochemical characteristics of the soils present at IRP Site 1, such as high pH, metals are likely to be present in less bioavailable forms (Tetra Tech 2001b). The volatile compound trichloroethene (TCE) has been detected in concentrations ranging from 0.7 µg/L at MW1-4 to 1 µg/L at MW1-11A (see Appendix B-5).



LEGEND

———	DRAINAGE AREA BOUNDARY
ODD	OXNARD DRAINAGE DITCH
DD	DRAINAGE DITCH
IRP	INSTALLATION RESTORATION PROGRAM
DA	DRAINAGE AREA

1750' 0 1750' 3500'

Scale: 1" = 3500'

Source: Modified from Fugro-McClelland 1991

Tetra Tech EM Inc.

NBVC POINT MUGU, CALIFORNIA
U.S. Navy Southwest Division, NAVFAC, San Diego

FIGURE 1-10
BASE DRAINAGE AREAS

Revised FS IRP Site 1
DS.A007.10571

2004-03-25 R:\Navy\Point Mugu\cto-368\ FIG 1-10.dwg TtEMI-SA deborah.ford

The fate-and-transport model, however, indicates rapid dilution at the sediment-surface water interface. No ecological risk is attributed to the TCE detections.

To summarize, the generation of leachate is minor and is contained within the waste and the semi-perched aquifer. The semi-perched aquifer contains naturally occurring, poor quality, non-potable water and is underlain by the "clay cap" aquitard. The semi-perched aquifer discharges to the surface water of Mugu Lagoon where rapid mixing in a significant tidal prism reduces any leachate concentrations promptly. Data indicate that no human health or ecological risks are associated with migration of any leachate from the IRP Site 1 landfill.

1.2.1.8 Landfill Gas Condensate

Gas condensate sampling was not included in any previous sampling efforts at IRP Site 1. Since IRP Site 1 was a burn site and the fill is relatively old, no gas condensate is expected.

For a complete site assessment, gas condensate sampling should be included. It is recommended therefore, to include such sampling in the near future at IRP Site 1.

1.2.2 Site History

This section provides a history of use at NBVC Point Mugu and a summary of previous investigations.

1.2.2.1 History of Use

IRP Site 1 was originally a tidal saltwater marsh. However, from the time of its development in 1952 until its 1975 closure, the landfill was used for lowland filling, dredge materials storage (not a solid waste), and solid waste landfilling and burning operations. There is no hazardous waste at IRP Site 1. The Dredge Materials Storage Area, located between the solid waste fill area and 13th Street, was used for non-waste material from the 1950's to 1979. Annual solid waste volumes burned or buried at the site are estimated at 10,000 tons.

Table 1-5 summarizes the types and quantities of wastes disposed of at IRP Site 1 during the time of its operation.

The disposal areas at IRP Site 1 include the following (Figure 1-4):

Reader's Guide

1. **Landfill was already closed (in 1975) in accordance with existing requirements.**
2. IRP Site 1 has minimal and acceptable human health risk for industrial scenario.
3. IRP Site 1 has minimal and acceptable ecological risk including present and long-term groundwater impacts.
4. Landfill meets Title 27 definitions as a "Closed Site" & "Closed, Abandoned, or Inactive (CAI) Unit."
5. Recommended Action: Maintain successful closure at IRP Site 1.

TABLE 1-5. TYPES AND QUANTITIES OF WASTES DISPOSED OF AT IRP SITE 1

Building	Origins of Waste	Waste Type	Estimated Amount	Period
74	Wind Tunnel Building	Waste Oil and Solvent	5,000-10,000 gal	1952-1960
77	Reciprocating Engine Shop and Combustion Test Building	Solvent and Hydraulic Fluid	10,000-20,000 gal	1951-1975
365	Aircraft Flight Equipment RD&T	Solvent, Hydraulic Fluid, and Oil	500-1,500 gal	1965-1975
4-5	Heavy Duty Equipment Maintenance	Waste Oil and Solvent	500-1,500 gal	1945-1970
4-15	Tire Repair Shop	Waste Oil and Solvent	500-1,500 gal	1947-1970
4-29	Auto Maintenance	Waste Oil and Solvent	250-1,500 gal	1960-1975
4-30	Auto Maintenance	Waste Oil and Solvent	250-1,500 gal	1960-1975
4-32	Auto Maintenance	Waste Oil and Solvent	250-1,500 gal	1960-1975
756	Public Works Auto Maintenance Shop	Waste Oil and Solvent	200-1,000 gal	1970-1975
776	Public Works Auto Maintenance Shop	Waste Oil and Solvent	200-1,000 gal	1964-1975
778	Public Works Auto Maintenance Shop	Waste Oil and Solvent	800-3,000 gal	1964-1975
67	Paint Shop – Public Works	Paint Sludge and Thinner	1,000-3,000 gal	1953-1975
67	Sandblasting – Public Works	Glass Beads and Paint	50-1,000 ft^3	1955-1975
68	Parts Cleaning – Public Works	Solvent	500-1,000 gal	1954-1975
776	Parts Cleaning – Public Works Automotive Shop	Polydip, Dry Cleaning Solvent, and Acid	500-2,500 gal	1964-1975
778	Parts Cleaning – Public Works Automotive Shop	PD-680 (Stoddard Solvent)	50-500 gal	1964-1975
"4" Area	Electric, Machine Carpenter, Cabinet, Rigger, Metal, Plumbing, and Refrigeration Shops	Waste Solvent, Thinner, Paint, and Freon	200-1,000 gal	1946-1954
"4" Area	Electric Shop	Transformer Fluid (including PCBs and PCB-contaminated oil)	Unknown	1954-1975
67, 68	Public Works Maintenance Shops 1 and 2	Waste Oil, Freon, Solvents, and Thinner	1,000-2,000 gal	1954-1960
4-6	Janitor Service	Unrinsed Pesticide Drums and Packages – DDT and Dieldrin	200-500 empty 5-pound containers	1948-1962
1-92, 103, 122	Pest Control / Grounds Maintenance	Triple-rinsed Containers	Unknown	1960-1975
5	Dental Clinic	Dental Amalgam (50% Mercury)	200-400 lb	1955-1968

Notes:

DDT Dichlorodiphenyltrichloroethane
ft^3 Cubic feet
lb Pounds
gal Gallons
PCB Polychlorinated biphenyl.
RD&T Research, development, and technology

Source: Tetra Tech (2000), from information in PRC and JMM (1993b)

- The Northern Burn and Fill Area for open burning and landfilling of solid wastes comprises about six acres at the northeastern end of IRP Site 1, between the eastern ends of 12th and 13th Streets. This area was used from 1952 to 1959 for open burning and disposal of residential, industrial, and maintenance shop wastes.

- The Southern Burn and Fill Area for open burning and landfilling of solid wastes comprises about seven acres at the southeastern corner of the landfill. This area was used from 1959 until 1965 for open burning and disposal of residential, industrial, and maintenance shop wastes. This area is located within the 19 acres of the solid waste disposal area.

- The Dredge Material Storage Area comprises about 10 acres and is located between the solid waste fill area and 13th Street. This area was used from the 1950's to 1979 to store non-waste dredge materials stockpiled from Calleguas Creek and Mugu Lagoon.

- The Solid Waste Fill Area comprises about 19 acres, and is located at the southern end of the landfill. This area was used from 1965 to 1975 for disposal of residential, industrial, and maintenance shop wastes.

Due to insufficient funding, the cover has been in need of repair and surface improvements. Currently, however, the Navy has a contract in place to repair and maintain the cover.

1.2.2.2 Previous Investigations

There were five investigations that were conducted at IRP Site 1. These included an initial assessment study (IAS), a site inspection (SI), an RI summarized in an RI technical memorandum, an RI for groundwater, and an RI addendum. In addition, there was a risk to vertebrates technical memorandum that was prepared for the Mugu Lagoon (also known as IRP Site 11). Each one of these investigations is summarized below.

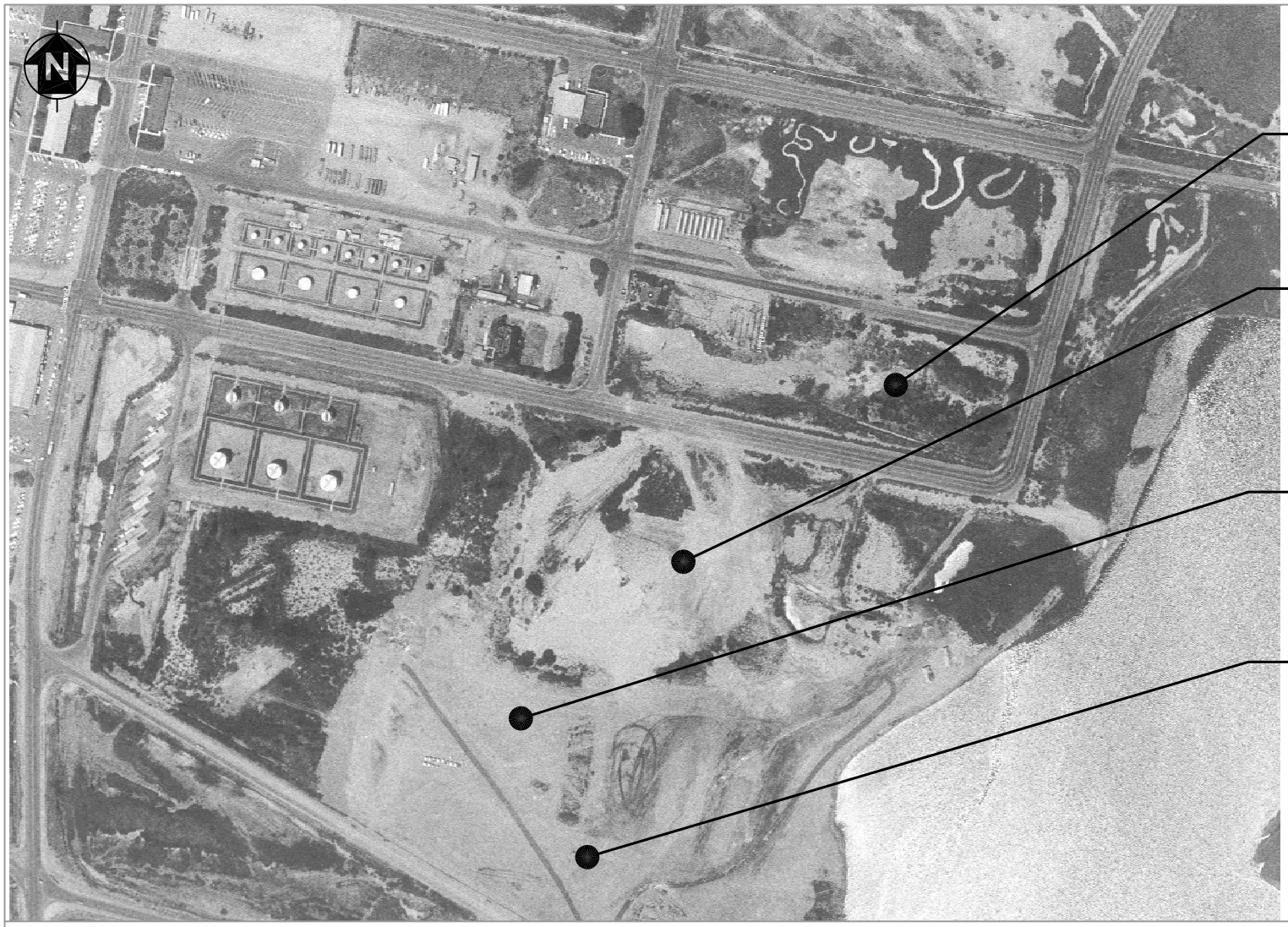
Figure 1-11 is an aerial photograph that shows the status of the landfill as of July 1975. One can see by examining the photograph that all landfill operations had ceased by this date and that the landfill had been graded and covered. Figure 1-11 is perhaps the best proof that the site had stopped receiving waste and was closed by grading and covering. In recent years, as a result of the IRP, the Navy has decided to chip seal the majority of the site. Where chip seal is not installed, the appropriate level of cover repair and maintenance will be provided as agreed with the state agencies.

Initial Assessment Study

In 1985, the Navy conducted an IAS at IRP Site 1. The IAS summarized information about the landfill and the types of wastes disposed at the site (Stearns, Conrad, and Schmidt and Landau Associates 1985).

Site Inspection

In 1991, the Navy conducted an SI at IRP Site 1 to determine whether hazardous materials were present at the site and whether shallow groundwater, potentially impacted by IRP Site 1, was affecting Mugu Lagoon (Fugro-McClelland 1991). Soil borings and monitoring wells were used to define the types and extent of contamination. Results of the SI are summarized in a final RI/FS field sampling plan (FSP) (PRC and JMM 1993b).



200' 0 200' 400'

Scale: 1" = 400'
Approximate

Tetra Tech EM Inc.

NBVC POINT MUGU, CALIFORNIA
U.S. Navy Southwest Division, NAVFAC, San Diego

FIGURE 1-11
AERIAL PHOTOGRAPH JULY 1975

Revised FS IRP Site 1
DS.A007.10571

2004-02-05 R:\Navy\Point Mugu\cto-368\ FIG 1-11.dwg TtEMI-SA deborah.ford

During the SI, seven shallow monitoring wells were installed at IRP Site 1. Shallow soil samples were collected during well installation. Organochlorine pesticides and inorganic chemicals were detected in these soil samples (Fugro-McClelland 1991; PRC and JMM 1993b).

During the SI, groundwater samples were collected from nine monitoring wells. Volatile organic compounds (VOC), semivolatile organic compounds (SVOC), organochlorine pesticides, polychlorinated biphenyls (PCB), and inorganic chemicals were detected in SI groundwater samples (Fugro-McClelland 1991; PRC and JMM 1993b). The VOCs and SVOCs detected in groundwater samples included methylene chloride, acetone, phenols, phthalates, dichlorobenzenes, and polynuclear aromatic hydrocarbons (PAH). Aroclor-1016, a PCB isomer, also was detected, as were dichlorodiphenyl-trichloroethane (DDT) and its degradation products, dichlorodiphenyidichloroethane (DDD) and dichloro-diphenyidichloroethene (DDE). Inorganic chemicals also were detected in groundwater at IRP Site 1. The analytical results from soil and groundwater sampling during the SI are summarized in Tables 1-6 and 1-7, respectively.

Phase I Remedial Investigation

In 1998, the Navy completed an RI field investigation at IRP Site 1 (Tetra Tech 2000). In general, sampling was performed in accordance with the sampling procedures in the RI/FS FSP (PRC and JMM 1993b) and the ecological assessment FSP (PRC and others 1994). The RI field investigation at IRP Site 1 included the following activities:

- Collection of surface and subsurface soil samples using a split-spoon sampler during hollow-stem auger drilling
- Installation of monitoring wells and collection of groundwater samples
- Geophysical survey
- Study of tidal influences
- Collection of ecological data

Soil boring samples were collected to further define the vertical and lateral extent of contamination at IRP Site 1, specifically in the vicinity of the Northern and Southern Burn and Fill Areas, the Dredge Materials Storage Area, and the perimeter of the Solid Waste Fill Area.

To replace or supplement the existing seven wells on the site, three new monitoring wells were installed in the upper part of the unconfined aquifer. Groundwater samples were collected at these wells during four quarters of sampling over a one-year period to further define trends in water quality and to verify sampling results from previous investigations.

A visual inspection and geophysical survey aided in confirming the prior use of the site for solid waste burial, open burning, and dredge materials storage and helped to delineate the landfill boundaries. The geophysical survey included both magnetic and electromagnetic surveys.

TABLE 1-6 RESULTS OF SOIL SAMPLING DURING SITE INVESTIGATION AT IRP SITE 1

Constituent	Laboratory Reporting Limit	Monitoring Wells						
		MW1-1 (0.5′)	MW1-2 (0.5′)	MW1-3 (0.5′)	MW1-4 (0.5′)	MW1-5 (0.5′)	MW1-6 (0.5′)	MW1-7 (0.5′)
Pesticides (µg/kg) (EPA Method 8080)								
DDE	16	ND[a]	ND[a]	ND[a]	ND[a]	ND[a]	ND[a]	ND[a]
DDD	16	ND[a]	ND[a]	ND[a]	ND[a]	ND[a]	ND[a]	ND[a]
DDT	16	ND[a]	ND[a]	ND[a]	ND[a]	ND[a]	ND[a]	39[a]
Metals[b] (mg/kg) (EPA Method 200.7)[c]								
Antimony	3.00	ND	ND	3.50	ND	ND	ND	3.50
Arsenic	0.125	1.17	6.51	4.46	4.78	1.42	2.65	6.21
Barium	0.500	29.2	48.4	53.7	127	46.5	41.0	63.2
Cadmium	0.500	1.55	2.90	12.9	7.55	1.95	4.15	9.80
Chromium	0.500	5.65	10.9	25.0	35.0	9.05	14.1	48.0
Cobalt	0.500	1.95	4.65	6.00	6.60	2.35	4.15	13.2
Copper	0.500	12.5	12.3	106	134	6.35	16.0	28.5
Lead	3.00	ND	ND	67.5	77.0	4.50	12.5	6.00
Mercury	0.125	ND	ND	1.05	0.603	ND	ND	ND
Molybdenum	1.00	ND	1.00	1.65	2.05	ND	1.00	4.55
Nickel	1.00	4.55	10.3	22.4	24.3	6.65	8.45	41.2
Silver	0.500	ND	ND	2.80	1.85	ND	ND	ND
Thallium	5.00	ND	6.00	15.5	7.50	ND	ND	13.0
Vanadium	0.500	8.85	24.3	27.9	51.8	18.5	30.9	72.2
Zinc	0.500	38.6	35.3	182	145	26.8	54.5	70.5

Notes:

[a] Reporting limit increased by a factor of 2 due to sample dilution.
[b] Beryllium and selenium were not detected in any soil sample.
[c] EPA Method 200.7 refers to metals analysis by inductively coupled plasma. This method reference is considered to be equivalent to EPA Method 6010, which is specific to the analysis of soils.

DDD Dichlorodiphenyldichloroethane
DDE Dichlorodiphenyldichloroethene
DDT Dichlorodiphenyltrichloroethane

EPA Environmental Protection Agency
µg/kg Microgram per kilogram
mg/kg Milligram per kilogram
MW1-1 (0.5') Location of soil sample at monitoring well and depth in parentheses
ND Not detected

Source: Tetra Tech (2000), from data reported in Fugro-McClelland (1991)

TABLE 1-7. RESULTS OF GROUNDWATER SAMPLING DURING SITE INVESTIGATION AT IRP SITE 1

Constituent	Laboratory Reporting Limit	Monitoring Wells										
		MW1-1	MW1-2	MW1-3	MW1-4	MW1-5	MW1-5 Supp.[a]	MW1-6	MW1-7	MW1-8[b]	C-1	C-2
VOCs (µg/L) (EPA Method 624)												
Acetone	2	ND	6	8	ND	11	ND, 12	4	ND	10	ND	ND
Methylene chloride	2	ND	ND	ND	ND	ND	ND, 3	ND	ND	ND	ND	ND
Carbon disulfide	2	ND	ND	ND	ND	ND	ND, ND	ND	ND	3	ND	ND
SVOCs (µg/L) (EPA Method 625)												
bis(2-ethyl-hexyl)phthalate[c]	1	7	2	ND	ND	56	110, 130	6	ND	16	4	3
Phenol	10	ND	ND	ND	ND	48	ND, ND	ND	ND	ND	ND	ND
1,4-Dichloro-benzene	1	ND	ND	ND	ND	8	ND, 5	ND	ND	ND	ND	ND
Phenanthrene	1	ND	ND	ND	ND	2	ND, ND	ND	ND	ND	ND	ND
Pesticides/PCBs (µg/L) (EPA Method 608)												
DDE	0.10	ND	ND	ND	ND	0.13	ND, ND	ND	ND	ND	ND	ND
DDD	0.10	ND	ND	ND	ND	0.16	0.11[d], ND	ND	ND	ND	ND	ND
Aroclor 1016	0.50	ND	ND	ND	ND	2.7	ND, ND	ND	ND	ND	ND	ND
Metals[e] (mg/L) (EPA Method 200.7)												
Antimony	0.060	ND	ND	ND	ND	0.080	NA	ND	ND	ND	ND	ND
Arsenic	0.003	0.028	0.019	ND	0.005	0.029	NA	0.011	ND	0.005	0.906	1.37
Barium	0.010	0.290	1.27	0.192	0.334	2.34	NA	0.103	0.121	0.124	0.856	0.927
Cadmium	0.010	0.011	0.015	0.021	0.013	0.164	NA	ND	ND	ND	0.043	0.053
Chromium	0.010	0.033	0.059	0.060	0.033	0.728	NA	ND	ND	0.059	0.145	0.151
Cobalt	0.010	0.012	0.017	0.016	0.018	0.143	NA	0.012	ND	0.011	0.061	0.061
Copper	0.010	0.022	0.037	0.068	0.053	1.55	NA	ND	ND	ND	0.154	0.193
Lead	0.060	ND	ND	ND	ND	0.990	NA	ND	ND	ND	ND	ND
Molybdenum	0.010	0.015	0.068	0.022	0.029	0.060	NA	ND	0.015	ND	0.676	0.027
Nickel	0.010	0.024	0.043	0.036	0.037	0.478	NA	ND	0.012	0.012	0.127	0.133
Selenium	0.003	0.033	0.048	ND	ND	0.013	NA	ND	ND	0.024	0.026	0.012
Silver	0.010	ND	ND	ND	ND	0.140	NA	ND	ND	ND	ND	ND
Thallium	0.100	ND	ND	ND	ND	0.430	NA	ND	ND	ND	ND	ND
Vanadium	0.010	0.043	0.081	0.092	0.061	0.809	NA	ND	ND	ND	0.283	0.314
Zinc	0.010	0.085	0.184	0.376	0.241	5.10	NA	1.44	ND	ND	0.516	0.571
Water Quality Parameters												
Conductivity (µmhos/cm^2)	0.050	15,000	3,450	35,400	31,600	21,000	NA	17,000	31,900	32,000	16,000	40,000
pH	—	7.96	8.59	7.54	7.73	7.68	NA	8.32	8.06	7.89	8.27	7.53
TOC (mg/L)	1.00	24.4	13.2	19.8	13.3	119	NA	45.3	11.7	10.8	10.1	10.1

Notes:

a Supplemental and duplicate supplemental samples of MW1-5 analyzed for VOCs, SVOCs, and pesticides/PCBs.

b Sample 1-8 is a duplicate sample for 1-7.

c Possible laboratory contaminant.

d Reporting limit increased by a factor of 2 due to sample dilution.

e Beryllium and mercury were not detected in any groundwater sample.

DDD Dichlorodiphenyldichloroethane
DDE Dichlorodiphenyldichloroethene
EPA U.S. Environmental Protection Agency
µg/L Micrograms per liter
mg/L Milligrams per liter
NA Not analyzed
ND Not detected
PCB Polychlorinated biphenyl
SVOC Semivolatile organic compound
TOC Total organic carbon.
VOC Volatile organic compound

Source: Tetra Tech (2000), from data reported in Fugro-McClelland (1991)

The monitoring wells at IRP Site 1 were used in the tidal influence study that was conducted to determine seasonal, base-wide tidal effects on groundwater. The study was conducted by measuring groundwater levels in four monitoring wells. The tidal ranges were calculated by determining the differences between the highest and the lowest groundwater levels in a 24-hour period.

Ecological sampling was conducted to assess the ecological community structure at IRP Site 1. Sampling was used to characterize the site's vegetation and to identify the mammals that use the site. Mammal surveys included both nocturnal and diurnal trapping.

The RI also recommended a groundwater study to evaluate attenuation of chemicals of potential concern (COPC) and chemicals of potential ecological concern (COPEC) migrating to surface water boundaries.

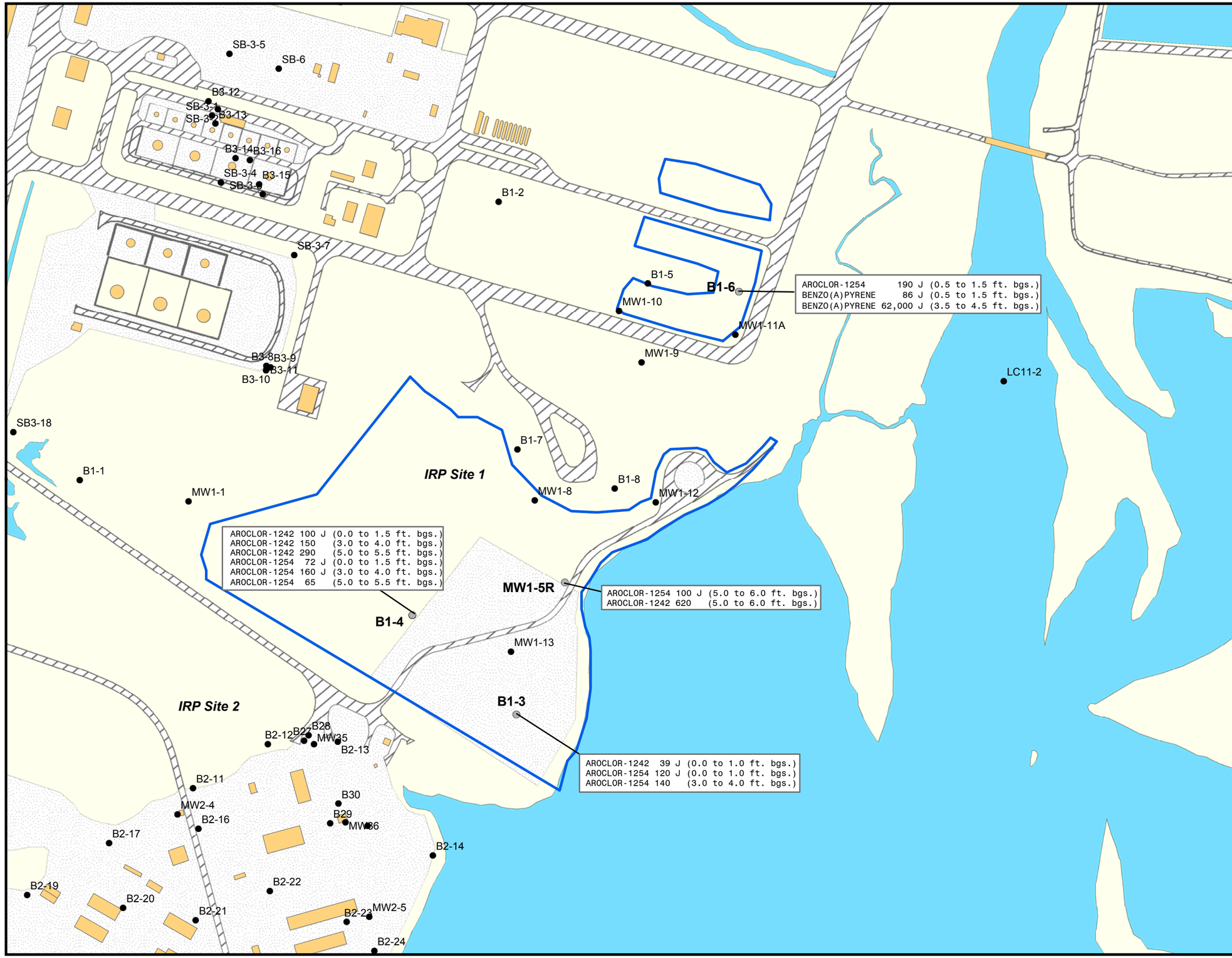
Remedial Investigation for Groundwater

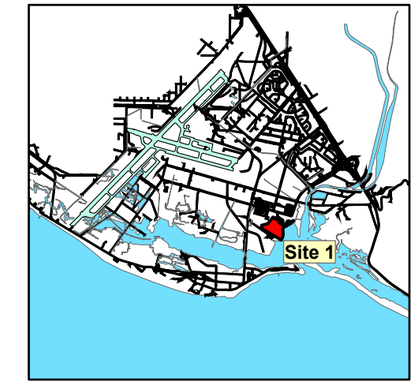
The RI for groundwater (Tetra Tech 2004) study implemented the RI's recommendations for groundwater assessment and addressed surface water in order to evaluate the potential for COPCs or COPECs to migrate from groundwater to surface water. The investigation addressed NBVC-wide surface water and groundwater issues. The field program was conducted from April 1998 through March 1999. The groundwater study at IRP Site 1 included the following activities:

- Collection and analysis of quarterly samples of surface water and groundwater from the unconfined aquifer and the Oxnard aquifer
- Installation of wells and cone penetrometer testing
- Quarterly tidal studies
- Aquifer tests

Surface water and groundwater samples collected during 4 quarters of sampling were analyzed for ions (anions, alkalinity, and dissolved metals) to identify and characterize various water masses and to aid in developing a conceptual hydrogeologic model for NBVC Point Mugu.

These data were also used to support numerical groundwater flow modeling and contaminant fate-and-transport simulations. An HHRA was conducted for surface water, and ERAs using surface water data and the results of the fate–and-transport model were prepared. An HHRA for groundwater was not prepared because there is no pathway for risk to human health. Additionally, a technical memorandum that addresses risk to vertebrates was prepared to evaluate the risk to mammals and birds from COPCs and COPECs at IRP Site 1 (Tetra Tech 2001b).





Legend

- SOIL BORING LOCATION WITH COPC RESULTS
- SOIL BORING LOCATION WITH NO COPC RESULT
- STRUCTURE
- IRP SITE BOUNDARY
- PAVED
- ROAD
- UNPAVED
- WATER

COPC CHEMICALS OF POTENTIAL CONCERN

IRP INSTALLATION RESTORATION PROGRAM

J ESTIMATED VALUE

CHEMICAL — CONCENTRATION IN MICROGRAMS PER KILOGRAM — DATA QUALIFIER (IF AVAILABLE)

AROCLOR-1254 100 J (5.0 to 6.0 ft. bgs.)

DEPTH OF SAMPLE BELOW GROUND SURFACE

0 150 300 600 Feet

Tetra Tech EM Inc.

NBVC Point Mugu Site, California

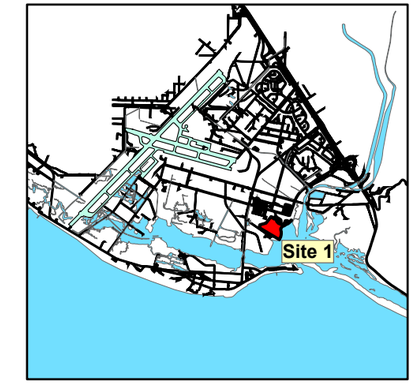
U.S. Navy Southwest Division, NAVFAC, San Diego

Figure 1-12

COPCs FOR PHASE 1 REMEDIAL INVESTIGATION

Revised FS IRP Site 1
DS.A007.10571

2004-01-28 o:\mugu\site1\mxd\figure1-12.mxd TtEMI-DN kurt.cholak



Legend

- SOIL BORING LOCATION WITH COPC RESULTS
- STRUCTURE
- IRP SITE BOUNDARY
- PAVED
- ROAD
- UNPAVED
- WATER

COPC CHEMICALS OF POTENTIAL CONCERN

IRP INSTALLATION RESTORATION PROGRAM

J ESTIMATED VALUE

CHEMICAL (Dioxin is represented by 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) toxicity equivalents.)

CONCENTRATION IN MICROGRAMS PER KILOGRAM

DATA QUALIFIER (IF AVAILABLE)

BENZO(B)FLUORANTHENE 460 J (3.0 to 3.5 ft. bgs.)

DEPTH OF SAMPLE BELOW GROUND SURFACE

N

0 150 300 600 Feet

Tetra Tech EM Inc.

NBVC Point Mugu Site, California

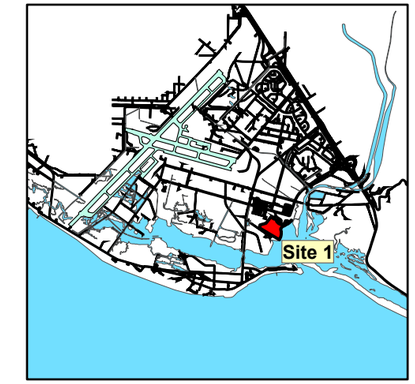
U.S. Navy Southwest Division, NAVFAC, San Diego

Figure 1-13

COPCs FOR PHASE 1 REMEDIAL INVESTIGATION ADDENDUM

Revised FS IRP Site 1
DS.A007.10571

2004-01-28 o:\mugu\site1\mxd\figure1-13.mxd TtEMI-DN kurt.cholak



Legend

- MONITORING WELLS WITH TOTAL DISSOLVED SOLIDS (TDS)
- STRUCTURE
- INSTALLATION RESTORATION PROGRAM SITE BOUNDARY
- PAVED
- ROAD
- UNPAVED
- WATER

SAMPLE TDS RESULT IN MICROGRAMS PER LITER

SAMPLE DATE

32,000 (2/6/1994)

N

0 150 300 600 Feet

Tetra Tech EM Inc.

NBVC Point Mugu Site, California

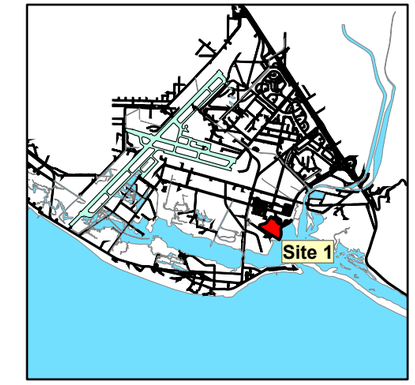
U.S. Navy Southwest Division, NAVFAC, San Diego

Figure 1-14

REMEDIAL INVESTIGATION FOR GROUNDWATER SAMPLING POINTS

Revised FS IRP Site 1
DS.A007.10571

2004-01-28 o:\mugu\site1\mxd\figure1-14a.mxd TtEMI-DN kurt.cholak



Legend

- ▲ SURFACE WATER SAMPLE LOCATION
- BUILDING
- INSTALLATION RESTORATION PROGRAM SITE BOUNDARY
- PAVED
- ROAD
- UNPAVED
- WATER

N

2,000 1,000 0 2,000 Feet

Tetra Tech EM Inc.

NBVC Point Mugu Site, California

U.S. Navy Southwest Division, NAVFAC, San Diego

Figure 1-15

PHASE 1 REMEDIAL INVESTIGATION FOR SURFACE WATER SAMPLING POINTS

Revised FS IRP Site 1
DS.A007.10571

2004-01-28 o:\mugu\site1\mxd\figure1-15_nodata.mxd TtEMI-DN kurt.cholak

1.2.4 Contaminant Fate and Transport

This section provides a description of soils, groundwater, and surface water as they relate to contaminant fate and transport.

1.2.4.1 Soils

This section discusses the fate and transport of COPCs in soils at IRP Site 1. A discussion of sediment at IRP Site 11 (Mugu Lagoon) is also presented as it pertains to the potential transmission of chemicals from IRP Site 1 to IRP Site 11 through groundwater and tidal movement.

Benzo(a)pyrene and Benzo(b)fluoranthene

Polynuclear aromatic hydrocarbons, which include benzo(a)pyrene and benzo(b)fluoranthene, have low water solubilities and are found sorbed to soil or to particles within groundwater. The elevated soil sorption coefficient for PAHs makes them highly immobile. As such, PAHs released to soil are expected to adsorb very strongly to the soil and are not expected to leach significantly to groundwater.

Sorption of PAHs to soil and sediment increases with increasing organic carbon content, and is directly dependent on particle size. Smaller particles with higher surface area–to-volume ratios are more efficient at sorbing PAHs. Sorption has been correlated with bioconcentration of PAHs in aqueous organisms.

Although environmental concentrations are greatest near source areas, the presence of PAHs distant from primary source areas indicates that they are reasonably stable in the atmosphere and are capable of long distance transport. PAHs will not hydrolyze, and evaporation from soils and surfaces is not expected to be significant.

Aroclor-1242 and Aroclor-1254

Polychlorinated biphenyls, which include Aroclor-1242 and -1254, are nonvolatile and chemically inert. PCBs that are sorbed to soils, especially highly chlorinated PCBs, remain significantly immobile against leaching. PCBs are also unlikely to be taken up by plants and therefore are not readily mobile in soil systems.

The potential for PCB biodegradation in soil is related to level of chlorination. Less chlorinated congeners are readily degraded in aerobic environments by numerous microorganisms. The tetrachlorobiphenyls are slowly degraded and the more chlorinated congeners are not degraded under aerobic conditions. However, under anaerobic conditions, more chlorinated congeners are degraded by reductive dechlorination. Thus, PCBs in soil environments may be biodegraded by a combination of anaerobic and aerobic processes.

Dioxins

Polychorinated dibenzo-p-dioxins (dioxins) are hydrophobic and have limited mobility in soils, particularly in soils with high organic carbon content. It has been estimated that for soils with 1 percent organic carbon (per dry weight of soil) and 30 percent water by volume, approximately 99.99 percent of the 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) will be sorbed on the soil at equilibrium. Migration of dioxins and furans will therefore occur primarily through transport of soil or sediment particles by overland runoff and wind dispersion. Dioxins are strongly bioaccumulated by fish, but do not appear to accumulate in plants growing in dioxin-contaminated soil.

Photodegradation on terrestrial surfaces may be an important transformation process for dioxins. During warm conditions, volatilization from soil surfaces during warm conditions may be a major removal mechanism. The persistence half-life of dioxins on soil surfaces may vary from less than 1 to 3 years, but half-lives in subsurface soil may be as long as 12 years. Screening studies have shown that dioxins are generally resistant to biodegradation.

Sediments at IRP Site 11 (Mugu Lagoon)

The presence of fine-grained sediments and the tidal action present at the site will increase the potential for metals to be bound to soil and sediment particles. Higher salinities, such as those present at NBVC Point Mugu, can decrease the bioavailability of metals. The neutral pH condition of surface water samples at NBVC Point Mugu suggests that adverse effects attributable to pH will be limited. The pH of surface water samples at NBVC Point Mugu ranges from 7.66 to 8.69, which is likely to decrease the bioavailability of metals to aquatic receptors.

1.2.4.2 Groundwater

Any COCs that are in groundwater would be transported according to the preceding discussion on hydrogeology. As discussed in Section 1.2.1.6, the unconfined aquifer and the aquifers of the upper and lower aquifer systems are separated by aquitards that are leaky (Page 1963). However, groundwater flow between the aquifers is probably minimal. The layering of fine-grained, relatively impermeable sediments with the coarser-grained, permeable sediments restricts vertical flow within the aquifer system.

Originally, the groundwater levels in the upper aquifer system were higher than the levels in the unconfined aquifer, and there was artesian flow in the upper aquifer system wells (DWR 1965). Excessive pumping of upper aquifer system wells lowered the potentiometric surface such that the wells in the Oxnard aquifer no longer flowed freely. However, new facilities and management practices introduced in the 1980s and 1990s have restored artesian flow conditions in lower aquifer system wells.

Although water levels in the upper aquifer system have declined, they are still higher than the level of the "clay cap" confining layer, and there is an upward vertical gradient between the upper aquifer system and the unconfined aquifer (Fugro-McClelland 1991).

The average TDS level in the unconfined aquifer at IRP Site 1 is 19,000 mg/L (Tetra Tech 2001a). The Navy is actively seeking a change for the semi-perched aquifer to nonbeneficial use. The semi-perched aquifer, although so designated, is not being used as a source of drinking water. The RWQCB is currently evaluating the Navy's request to remove the municipal and domestic supply designation from the semiperched aquifer at NAS Point Mugu.

Figure 1-9 shows how groundwater flows across IRP Site 1 and how it is influenced by the surrounding surface water features. In general, groundwater at IRP Site 1 flows from the north-northeast and discharges to the southeast along the edge of the site, into the mudflats bordering Mugu Lagoon. Along the northeastern edge of the site, groundwater flows to the southwest toward tidal ponds and the Laguna DD 7. Thus, an approximate north-south groundwater divide extends through IRP Site 1. The position of the groundwater divide and the slope of the groundwater surface vary with seasonal groundwater elevations (Figure 1-9).

No trends in groundwater chemistry could be established that attribute metal COPECs in surface water to IRP Site 1, and therefore the fate-and-transport assessment cannot be used to resolve groundwater issues at IRP Site 1. In a recent groundwater evaluation summary report (Battelle 2002), a Mann-Kendall trend statistical analysis was performed with groundwater data collected in June and July, 2002. In general, the results of the Mann-Kendall analyses show a high degree of variability in the predicted trends. Not only is there no clear trend among a given analyte, there is also no clear trend among various analytes for a given well. Furthermore, the spatial distribution of increasing and decreasing trends does not show a clear pattern, in other words, a consistently increasing trend in downgradient wells. Comparison of current groundwater concentrations to concentrations observed in background monitoring well MW3-4 indicates that most concentrations of metal COPECs were less than the background level.

Concentrations of metals at IRP Site 1 were compared to ecological health-effects levels in the literature to further evaluate potential risk to ecological receptors. In general, chemical concentrations were less than the ecological effects levels. Site-specific physical and chemical data, such as pH and salinity, were evaluated along with factors affecting bioavailabililty. The pH and salinity conditions present at NBVC Point Mugu indicate that the bioavailability of metals will be reduced through time. Further discussion of fate and transport of COCs is an integral part of the HHRA and the ERA described in Appendices C and D.

1.2.4.3 Surface Water

Concentrations in soil are not likely to be contributing to concentrations of metals in surface water. No trends in groundwater chemistry could be established that attribute metals in surface water to IRP Site 1. Inconsistent chemical concentrations, including TDS, in samples throughout

Mugu Lagoon indicate that tidal mixing and dilution play a significant role in the surface-groundwater and sediment-surface water interface. As a result, evaluation of certain COPECs for surface water did not indicate a risk to ecological receptors because of rapid dilution of groundwater chemicals in the surface water within a very short distance of the sediment-surface water interface. Concentrations of these chemicals were generally less than ecological effects levels in the literature and were sporadically detected, and readings for metals were affected by variations in TDS values.

Discussion of fate and transport of chemicals in surface water is given in Appendix D.

1.2.5 Baseline Risk Assessment

Four investigations (Tetra Tech 2000, 2001a, 2001b, and 2002) were conducted at IRP Site 1 to evaluate the nature and extent of chemical concentrations in environmental media at the site from historical landfill activities. As part of these investigations, HHRAs and ERAs were performed to assess potential human health and ecological risks associated with exposure to chemicals detected in IRP Site 1 environmental media under current and anticipated future land use conditions. The HHRA and ERA are required by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (Title 40 *Code of Federal Regulations* (CFR) 300.430) and provide information for risk managers to evaluate whether action is warranted to mitigate potential effects from exposure to IRP Site 1 chemicals.

This section summarizes the HHRA and ERA findings. Appendices C and D provide a detailed summary of the methods and assumptions used in the HHRAs and ERAs to select COPCs and COPECs, identify potentially complete exposure pathways, assess potential exposures, evaluate toxicity of COPCs and COPECs, and estimate potential risks.

1.2.5.1 Summary of Human Health Risks

HHRAs were performed as part of the phase 1 RI technical memorandum (Tetra Tech 2000) and RI addendum (Tetra Tech 2001a) to assess potential human health risks associated with exposure to COPCs in IRP Site 1 landfill soils. As part of the RI for groundwater (Tetra Tech 2004), an additional HHRA was conducted to evaluate the potential for human health risks associated with exposure to COPCs that may migrate from IRP Site 1 soil and groundwater to surface water at the Mugu Lagoon.

The human health risk findings for soil and surface water are summarized below. Health risks associated with groundwater were not evaluated because groundwater quality does not meet drinking water criteria (Tetra Tech 2004).

Risk Summary

Human health COPCs identified for IRP Site 1 soil included SVOCs, including PAHs; pesticides; PCBs; dioxins; and inorganic chemicals, including lead. Potential health risks from exposure to COPCs in IRP Site 1 surface soil (0 to 1 foot bgs) were assessed for a future industrial worker exposure scenario. Potential exposure to COPCs under this scenario was assumed to occur via incidental ingestion of and dermal contact with surface soil, and inhalation of airborne surface soil particulates and VOCs. The evaluation was limited to surface soil because future use of the site requires maintenance of a containment system for the landfill, precluding future disturbance of subsurface soils (soils below 1 foot bgs). A future residential exposure scenario was not evaluated because required maintenance of a landfill containment system will preclude future residential use of the site (EPA 1993). A current exposure scenario was not evaluated because access to the historic waste disposal areas of the site is severely restricted.

The results of the phase 1 RI technical memorandum and RI addendum HHRAs show that the excess lifetime cancer risk (ELCR) for exposure to COPCs in surface soil at IRP Site 1 is between the 10^{-4} and 10^{-6} risk management range that EPA considers acceptable for industrial land use scenarios (EPA 1991b). The hazard index (HI) is less than 1.0, the threshold HI for noncancer effects. Industrial exposure to lead was assessed by comparing the exposure point concentration (EPC) for lead in surface soil to the Region 9 industrial preliminary remediation goal (PRG) of 750 milligrams per kilogram (mg/kg) for lead in soil; the EPC did not exceed the PRG (EPA 2000a). These results show that remediation of soil at IRP Site 1 is not required to protect human health. However, because the risk assessment for soil is based on an anticipated future land use scenario that prohibits disturbance of site subsurface soil and hence any development of the site, a remedial alternative that limits future land use is required.

Reader's Guide

1. Landfill was already closed (in 1975) in accordance with existing requirements.
2. **Site 1 has minimal and acceptable human health risk for industrial scenario.**
3. Site 1 has minimal and acceptable ecological risk including present and long-term groundwater impacts.
4. Landfill meets Title 27 definitions as a "Closed Site" and "Closed, Abandoned, or Inactive (CAI) Unit."
5. Recommended Action: Maintain successful closure at Site 1.

Surface Water Risk Summary

As part of the RI for groundwater, health risks were assessed for exposure to COPCs in surface water in Mugu Lagoon (IRP Site 11), which is immediately adjacent to IRP Site 1. Results of the surface water risk assessment for Site 11 are included with the summary of risks for IRP Site 1 because chemicals present in IRP Site 1 soil and groundwater may impact IRP Site 11 surface water via runoff and groundwater discharge. Human health risks associated with groundwater in the unconfined aquifer were not evaluated because groundwater quality in the unconfined aquifer did not meet drinking water criteria and a complete exposure pathway does not exist (Tetra Tech 2004).

COPCs identified for surface water included VOCs, pesticides, and inorganic chemicals. Potential health risks from exposure to COPCs in surface water were assessed for a wildlife manager exposure scenario, based on current and anticipated future use of Mugu Lagoon as a wildlife refuge. Potential exposure under this scenario was assumed to occur via incidental ingestion of and dermal contact with surface water.

The results of the RI for groundwater HHRA shows that the ELCR for exposure to COPCs in surface water that may migrate from IRP Site 1 to IRP Site 11 is within the 10^{-4} and 10^{-6} risk management range EPA considers acceptable for industrial land use scenarios. The HI, however, is 4. The elevated HI is attributable primarily to concentrations of thallium. Results of an uncertainty analysis conducted for the surface water HHRA, however, indicate that it is highly likely that the noncancer hazard associated with thallium was overestimated. Therefore, the HI for surface water exposures is unlikely to exceed the threshold HI of 1.0. Appendix C details the uncertainty analysis, which examines the effects on the HI of assumptions used to address the presence of thallium at the site, concentrations of thallium, and contact rates with thallium.

In summary, results of the risk assessment for surface water show that remediation of IRP Site 1 sources is not required to protect human health from exposure to surface water. However, the potential exposures addressed in the risk assessment are based on the assumption that the Mugu Lagoon (IRP Site 11) will only be used as a wildlife refuge. If land use at the Mugu Lagoon changes, then potential risks will need to be reassessed.

Reader's Guide

1. Landfill was already closed (in 1975) in accordance with existing requirements.
2. Site 1 has minimal and acceptable human health risk for industrial scenario.
3. **Site 1 has minimal and acceptable ecological risk including present and long-term groundwater impacts.**
4. Landfill meets Title 27 definitions as a "Closed Site" and "Closed, Abandoned, or Inactive (CAI) Unit."
5. Recommended Action: Maintain successful closure at Site 1.

1.2.5.2 Summary of Ecological Risks

IRP Site 1 consists of both upland and marsh areas. The majority of the site is relatively flat, although portions of the surface of the landfill are mounded as a result of piles of soil and metal and construction debris. Portions of the upland areas at IRP Site 1 consist of unvegetated roadways, the landfill, and the laydown area resulting from a removal action and cover improvements conducted in 1997 (Tetra Tech 2001a); however, approximately 18 acres of viable upland habitat exists at the site. Therefore, both soil (in the upland area) and sediment (in the marsh areas) present a complete exposure pathway for ecological receptors at IRP Site 1; these pathways were investigated in the final phase 1 RI technical memorandum (Tetra Tech 2000), risk to vertebrates technical memorandum (Tetra Tech 20001b), the RI for groundwater (Tetra Tech 2004), and the ecological risk assessment addendum (Tetra Tech 2003). Groundwater and surface water are also potential transport pathways; these pathways were also evaluated in the RI for groundwater (Tetra Tech 2004). The ecological findings for soil and surface water are summarized below.

Soil Risk Summary

Results of the ERAs conducted at IRP Site 1 indicate that risk to ecological receptors from chemical concentrations in soil is not expected to be significant. This determination was based on the limited habitat value of IRP Site 1, the limited distribution of lead at the site, and the high pH of site soils that would limit the solubility and bioavailability of lead in soils (Tetra Tech 2000; Tetra Tech 2001a). In addition, concentrations of chemicals in soil are not likely to be contributing to concentrations of metals in surface water (Tetra Tech 2001a). Evaluation of risk to vertebrate receptors indicates little potential for effects in higher trophic-level receptors (Tetra Tech 2001a, 2001b). Food-chain models presented in the risk to vertebrates technical memorandum (Tetra Tech 2001b) indicate that representative species such as the deer mouse and American kestrel are not at an immediate or significant risk from any soil COPEC modeled in IRP Site 1.

Results of the screening-level ERA for IRP Site 1 in the risk to vertebrates technical memorandum (Tetra Tech 2001b) indicate that chemical concentrations in soil at the site do not pose unacceptable risk to ecological receptors. No action was recommended based on the risk to vertebrate receptors at IRP Site 1.

Surface Water Risk Summary

Results of the RI groundwater study (Tetra Tech 2004) identified metals as COPECs in groundwater at IRP Site 1 because they currently exceed AWQC in groundwater at the sediment-water interface; concentrations of these metals, however, were generally less than effects levels reported in the literature and were only sporadically detected. In addition, TCE was identified at low concentrations at two locations at IRP Site 1. Further evaluation in the ERA for surface water indicated that TCE would not pose risk to ecological receptors because chemicals in groundwater would be rapidly diluted in the surface water within a short distance of the sediment-surface water interface. Consequently, TCE was not considered an ecological COC for surface water. No trends in groundwater chemistry could be established that attribute concentrations of COPECs in surface water at Mugu Lagoon (IRP Site 11) to IRP Site 1. Analytical results for surface and groundwater samples are found in Appendix B.

Validation surveys or further ecological analysis of surface water were not recommended to delineate and confirm the risk to marine communities introduced by contaminated surface water. The ERA in the RI for groundwater (Tetra Tech 2004) did not identify unacceptable risk to ecological receptors from surface water. The evaluation concluded that pesticides are likely originating from agricultural discharges upstream of the base, indicating that concentrations of these chemicals are not likely Navy related; therefore, pesticides were not considered COPECs in the evaluation, with the exception of gamma-chlordane. Gamma-chlordane was found in only 2 of 40 samples, and ecological receptors would not likely be exposed to the maximum concentrations long enough for a chronic exposure because of the constant mixing of surface water. Results of the ERA for IRP Site 1 in the RI for groundwater (Tetra Tech 2004) indicate that chemical concentrations at the site do not pose unacceptable risk to ecological receptors, and

are not contributing to concentrations of chemicals in surface water at IRP Site 11. The only ecological COC identified in the latest ERA (Tetra Tech 2003) for IRP Site 11 was chromium but IRP Site 1 is not considered a source of this metal.

Groundwater Risk Summary

The groundwater-to-surface water pathway was modeled to quantify potential transport of groundwater chemicals to surface water. Modeling of organic chemicals at most sites either indicated that concentrations would not be exceeded when they reached the groundwater-to-surface water interface or that concentrations eventually would exceed the screening criteria if they reached surface water, but only after extremely long time periods (on the order of 100 to several thousand years). Modeling of inorganic chemicals resulted in migration times ranging over several orders of magnitude, and insufficient data at most sites prevented an estimation of attenuation.

Modeling could not be performed accurately where insufficient information exists to delineate a model source. Fate-and-transport modeling performed at IRP Site 1 could not be performed for inorganic COPECs because the existing extent of these COPECs could not be determined. Modeling attemps conservatively overestimated expected migration times because it is assumed that interaction between groundwater and surface water is immediate, based on the proximity of surface water to the site and the strong tidal influence in groundwater at the site. The underlying rationale for this is assumption is the sporadic variation of concentrations of chemicals in surface water over time.

Several metals sporadically exceed AWQC but concentrations are less than literature effects levels for ecological receptors. In addition, locations with the greatest chemical concentrations are beneath paved surfaces, thereby eliminating a complete exposure pathway. Concentrations in the vegetated upland areas are considerably less. In addition, due to the physicochemical characteristics of the soils present at IRP Site 1, such as high pH, metals are likely to be present in less bioavailable forms (Tetra Tech 2001b). The volatile compound TCE has been detected, but the fate-and-transport model indicates rapid dilution at the sediment-surface water interface. No ecological risk is attributed to TCE detections.

1.3 CONCLUSIONS

The ELCR associated with concentrations of COPCs in surface soil at IRP Site 1 is within the risk management range that EPA considers acceptable for industrial land use. Likewise, concentrations of COPCs in surface soil do not result in an HI greater than 1.0. Because IRP Site 1 is a landfill and future use of the site requires maintenance of a containment system for the landfill, it was not necessary to estimate potential risk for a residential exposure scenario (EPA 1993). Implementation of institutional controls that restrict future land use activities at the site, however, is required.

The ELCR for exposure to COPCs in surface water at IRP Site 1 is within the 10^{-4} and 10^{-6} risk management range that EPA considers acceptable for industrial land use scenarios. The HI is 4 and is attributable primarily to concentrations of thallium. Results of an uncertainty analysis conducted for the surface water HHRA, however, indicate that it is likely that the noncancer hazard associated with thallium was overestimated, and that the HI for surface water is unlikely to exceed the threshold HI of 1.0.

Ecological risk evaluations of soil concentrations at IRP Site 1 indicate that concentrations of chemicals in soil are not likely to be of concern to vertebrate receptors. The landfill cap at the site currently eliminates or greatly reduces the exposure of vertebrate receptors to chemicals in soil. The site is not likely to provide significant habitat due to the continued presence of a cap that reduces exposure to soil. Results of food-chain modeling indicate that soil concentrations do not pose a risk to small herbivorous mammals (deer mouse) or omnivorous birds (American kestrel).

In addition, concentrations of COPECs in soil at IRP Site 1 are not likely to be contributing to relatively high concentrations of COPECs in surface water at Mugu Lagoon. No unacceptable risk to ecological receptors was identified for surface water. Although COPEC concentrations in groundwater are elevated, these concentrations will not reach surface water at concentrations considered harmful to ecological receptors. This is because of the rapid dilution of groundwater chemicals in the surface water within a very short distance of the sediment-surface water interface. In addition, concentrations of COPECs were less than literature effects levels, indicating minimal risk to ecological receptors.

2.0 IDENTIFICATION OF APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND REMEDIAL ACTION OBJECTIVES

The identification and evaluation of potential federal and State of California ARARs from the universe of regulations, requirements, and guidance is presented in Appendix E. This evaluation includes an initial determination of whether potential ARARs qualify as ARARs, and a comparison for stringency between the federal and state regulations to identify the controlling ARARs. This chapter summarizes the initial determinations regarding those potential ARARs for each response action alternative retained for detailed analysis in this revised FS report for IRP Site 1. The final determination of ARARs will be made by the Navy in the record of decision (ROD) after public review, as part of the response action selection process.

2.1 INITIAL DETERMINATION OF ARARs

With the revised RAOs and proposed remedial alternatives contained in this revised FS, the majority of state and federal requirements identified in the ARARs analysis stem from solid waste laws and regulations. Attachments E.1 through E.7 in Appendix E contain a historical description and evolution of these requirements as they relate to IRP Site 1. Other pertinent laws and regulations include air quality, threatened and endangered species, migratory bird species, coastal resources, and water quality.

Three sets of solid waste regulations potentially apply to IRP Site 1 – *California Code of Regulations* (CCR) Titles 22, 23, and 27, and the Resource Conservation and Recovery Act (RCRA) Subtitle D. However, of these, CCR Titles 22 and 23 do not apply because they pertain only to hazardous waste (as of 1997). There is no hazardous waste at IRP Site 1. RCRA Subtitle D also does not pertain because its effective date occurred after the Site 1 landfill was closed. For a more detailed description of applicable solid waste regulations, see Attachment E.5 in Appendix E.

Reader's Guide

1. **Landfill was already closed (in 1975) in accordance with existing requirements.**
2. Site 1 has minimal and acceptable human health risk for industrial scenario.
3. Site 1 has minimal and acceptable ecological risk including present and long-term groundwater impacts.
4. **Landfill meets Title 27 definitions as a "Closed Site" and "Closed, Abandoned, or Inactive (CAI) Unit."**
5. Recommended Action: Maintain successful closure at Site 1.

IRP Site 1 ceased operation as a landfill and was closed in 1975. Based on the Navy's research, Title 23 CCR, Section 2535 was adopted in 1972 and addresses completion of disposal operations. At that time, Title 23 addressed both solid waste and hazardous waste. IRP Site 1 was closed in a manner that met the substantive portions of those closure requirements. Under that set of requirements, the Navy has continuous responsibility to ensure protection from gases, and protection of usable surface water and groundwater and their quality; specific cover requirements, however, are absent.

This finding is also consistent with the draft closed, abandoned, and inactive (CAI) sites guidance being developed by California Integrated Waste Management Board (IWMB), which is based on the local enforcement agency (LEA) advisory dated June 10, 1993 (rescinded January 15, 2002). The original advisory and the draft guidance specifically address appropriate actions for sites that were not closed under Title 14, Article 7.8, "Disposal Site Standards Closure and Postclosure" (Sections 17760 through 17796). The LEA advisory stated that for sites that last received waste prior to 1976, no set requirements existed at the state level, although there may have been local closure requirements. There are no local closure requirements imposed by the County of Ventura.

The initial determination of ARARs for IRP Site 1 is listed below by regulatory category and are discussed in detail in Appendix E.

2.1.1 Federal Chemical-Specific ARARs

There are no federal chemical-specific ARARs.

2.1.2 Federal Location-Specific ARARs

- The Coastal Zone Management Act, Section 307 requires that actions conducted within the coastal zone be consistent with the state coastal zone management plan (CZMP).

- The Migratory Bird Treaty of 1972, Title 16 of the United States Code (USC) Section 703 prohibits taking native migratory bird species.

- The Endangered Species Act of 1973, 16 USC Section 1536(a) requires that threatened or endangered species and their habitat be conserved.

2.1.3 Federal Action-Specific ARARs

There are no federal action specific ARARs for IRP Site 1.

2.1.4 State Chemical-Specific ARARs

- State Water Resources Control Board and Regional Water Quality Control Board's "Comprehensive Water Quality Plan for the Los Angeles Basin" regulates storm water discharges. Actions carried out at IRP Site 1 must meet the substantive provisions of the state-administered National Pollutant Discharge Elimination System (NPDES) stormwater program for industrial sites or construction sites 1 acre or greater through best management practices (BMP) or existing permits held by the base.

- IRP Site 1 should not have methane gas levels greater than the limits outlined in 27 CCR 20919.5(a) and 20921(a)(1) and (2).

2.1.5 State Location-Specific ARARs

- The Endangered Species Act (ESA), California Fish and Game Code Section 2080 prohibits "take" of any species that the commission determines to be an endangered species or a threatened species. Take is defined in Section 86 of the Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill."

- The California Coastal Act of 1976 (*Public Resources Code* Sections 30000 – 30900 and 14 CCR 13001-13666.4) regulates activities associated with development to control direct significant impacts on coastal waters and to protect state and national interests in California coastal resources.

2.1.6 State Action-Specific ARARs

- Pertinent sections of Title 27, CCR cover maintenance; landfill gas monitoring; precipitation, erosion, and drainage controls; and future land use controls.

- Ventura County Air Pollution Control District Rule 221 requires control of particulate emissions related to construction activity.

2.2 REMEDIAL ACTION OBJECTIVES

RAOs are established to allow identification and screening of remedial alternatives that achieve protection of human health and the environment consistent with reasonably anticipated land use. The determination of RAOs includes consideration of site-specific risks and ARARs in accordance with CERCLA, as amended by the Superfund Amendments and Reauthorization Act (SARA).

The RAOs presented in this section are specific to chemicals in soils, surface water, and groundwater. They are also specific to the presence of methane gas. They were developed based on the future industrial land use of Site 1. As described in Section 3.0, industrial land use as a storage yard is the anticipated land use scenario, as designated by NBVC Point Mugu, which will maintain ownership and control of IRP Site 1.

2.2.1 Landfill Gas

Based on CERCLA and the ARARs, the RAO for landfill gas at IRP Site 1 is proposed as follows:

- Verify that IRP Site 1 does not have methane gas levels greater than the limits outlined in 27 CCR 20919.5(a) and 20921(a)(1) and (2).

2.2.2 Soils

Based on CERCLA, the HHRA in the RI (Tetra Tech 2000), and the ARARs, the RAOs for soils at IRP Site 1 are proposed as follows:

- Prevent residential land use.
- Repair existing cover and improve drainage south of 13th Street, where necessary.
- Address physical safety hazard presented by surface solid waste located in the western part of the solid waste and fill areas.
- Prevent disturbance of the subsurface soil and contents of landfill.

2.2.3 Groundwater

Based on CERCLA, the HHRA and the ERA in the RI for groundwater (Tetra Tech 2004), and the ARARs, the following RAO is proposed for groundwater at IRP Site 1:

- Prevent the use of IRP Site 1 groundwater as a source of drinking water.

The response actions and the remedial alternatives evaluated for landfill gas, soils, and groundwater at IRP Site 1 consider the need to continue existing actions such as maintenance of site access controls and final cover. They are discussed in Section 3.0 as potential remedial measures, and they are included in and evaluated as part of several remedial alternatives.

3.0 DEVELOPMENT AND SCREENING OF ALTERNATIVES

The presumptive remedy approach for IRP Site 1 eliminates the need for developing process options and combining them into alternatives for initial screening. Based on EPA guidance, the presumptive remedy for landfills is containment of the disposed material. However, containment has already been achieved at IRP Site 1. Remedial options described in this section address the nine selection criteria required by CERCLA.

The presumptive remedy for landfills does not incorporate assessment and control of contaminant migration through leachate, groundwater, or soil vapor. Based on the prior reports completed for IRP Site 1, there are no risks associated with chemical migration from the landfill, and the surrounding environment is not adversely affected by the presence of the landfill in its current condition, assuming an industrial land-use scenario. Therefore, no alternatives for treatment of leachate, groundwater, or soil vapor have been proposed.

It is assumed that a CERCLA 5-year review would be conducted for all action-based alternatives; the review is not included as a remedial option because it has no comparative value in the development and screening of alternatives. However, costs for the 5-year review are included for planning purposes.

3.1 SELECTION OF REMEDIAL OPTIONS

The next step in the FS process is choosing and combining the various remedial options from the presumptive remedy guidance to form remedial alternatives that meet the RAOs of minimizing exposure to worker populations. The following are descriptions of the selected appropriate remedial options for the site that will be combined, in part, to develop the remedial alternatives.

3.1.1 No Further Action

The no–further-action alternative is required as part of the remedial screening process and provides a baseline against which other alternatives are compared. Under this alternative, no action would be taken to alter the landfill.

3.1.2 Institutional Controls

Institutional controls are legally enforceable site restrictions that serve to prevent access to a site or future use of a site. Institutional controls do not eliminate the risk associated with the contamination at a site, but reduce exposure by preventing unnecessary use of the site.

3.1.3 Site Boundary Controls

Site boundary controls prevent direct physical access to a site through the use of an impenetrable device. Site boundary controls do not eliminate the risk associated with the contamination at a site but reduce exposure by preventing unnecessary use of the site and trespass onto the site. IRP Site 1 has sufficient boundary controls in place. The Navy does not allow public disposal and has not allowed public access to the site since more than 1 year before it stopped accepting waste, and the site continues to meet the substantive provisions of 27 CCR 21135[b].

3.1.4 Landfill Cover Repair, Maintenance, and Drainage Improvements

Landfill cover repair, maintenance, and drainage improvements would modify the area currently not covered by chip seal south of 13th Street to limit degradation, settling, and erosion of cover material. This would prevent the exposure to solid waste in the subsurface and prevent erosion and runoff to the surrounding environment. Maintenance items performed would include gas sampling. In addition, the area presently covered by chip seal will also be maintained by removing vegetation that may grow within or around the chip seal as well as repairing cracks in the chip seal. The alternative will (1) provide adequate and proper grading, cover, drainage and erosion protection, and (2) meet all potential ARARs listed in Table E-1.

Alternative 3 response action would include, where necessary, grading, adding earthen cover, characterize drainage, provide drainage structures, removing inappropriate vegetation, and providing erosion protection. The landfill is currently subject to erosive conditions that threaten the long-term integrity of the existing native soil cover, and current landfill drainage conditions promote the ponding of water and infiltration through the existing cover. The existing soil cover would be cleared of vegetation and graded, with earthen material, vegetation, or chip seal added as needed to create a cover having adequate soil depth, slopes to promote proper drainage, and erosion protection. Alternative 3 will provide a cover that will be a barrier between the surface and underlying waste, and will minimize surface water transport of landfill cover material, surface water accumulation, and erosion, and prevent the exhumation of waste materials.

3.2 SELECTION OF REMEDIAL ALTERNATIVES

The following remedial alternatives have been developed based on the above-listed containment and assessment components in the presumptive remedy guidance.

- Alternative 1: No Further Action
- Alternative 2: Institutional Controls
- Alternative 3: Institutional Controls; and Landfill Cover Repair, Maintenance, and Drainage Improvements

This section evaluates the three remedial alternatives based on nine criteria as required by the NCP in 40 CFR 300.430(e). These nine criteria are listed and discussed below.

- Overall protection of human health and the environment
- Compliance with ARARs
- Long-term effectiveness and permanence
- Reduction in toxicity, mobility, and volume through treatment
- Short-term effectiveness
- Implementability
- Cost
- State acceptance

- Community acceptance

3.3 DETAILED ANALYSIS OF ALTERNATIVES

The evaluation criteria are described in the following nine sections. Table 3-1 outlines the evaluation criteria as they relate to each of the alternatives.

3.3.1 Overall Protection of Human Health and the Environment

This criterion assesses whether each alternative provides adequate protection of human health and the environment. The overall assessment of protection draws on the evaluations of long-term effectiveness and permanence, short-term effectiveness, and compliance with ARARs. Protectiveness focuses on how site risks are reduced or eliminated by each alternative. Risk reductions are associated with how effectively an alternative meets the RAOs. This criterion is considered a threshold and must be met by the selected alternative.

3.3.2 Compliance with ARARs

This criterion is used to evaluate whether each alternative will meet all identified federal and state ARARs, or whether justification exists for waiving one or more ARARs. The detailed analysis will describe how each alternative will meet these requirements. This criterion is also a threshold that must be met by the selected alternative unless an ARAR is waived. Section 2.0 summarizes the results of the ARARs evaluation for IRP Site 1. Appendix E identifies ARARs for IRP Site 1.

3.3.3 Long-term Effectiveness and Permanence

Each alternative is evaluated in terms of risk remaining at the site after RAOs have been met. The primary focus of this evaluation is the extent and effectiveness of controls used to manage the risk posed by treatment of residuals or untreated wastes. The following criteria are considered:

TABLE 3-1 COMPARATIVE SUMMARY OF REMEDIAL ALTERNATIVES

National Oil and Hazardous Substances Pollution Contingency Plan (NCP) Criteria	**Alternative 1: No Further Action**	**Alternative 2: Institutional Controls**	**Alternative 3: Activities Prescribed in Alternative 2 plus Landfill Cover Repair, Maintenance, and Drainage Improvements**
Overall Protection of Human Health and the Environment	This alternative does not eliminate, reduce or control exposure to landfill contents or contaminated soil. However, past reports and risk assessments completed for IRP Site 1 have determined that based on the contaminant concentrations and current condition and use of the site there are no risks associated with the site. The site in its current condition is protective of human health and there are no adverse effects to the surrounding environment. This alternative currently meets the RAOs of controlling worker exposure scenarios, but has no institutional controls to ensure these scenarios. Under this alternative, current use of the site can continue and the alternative will remain protective of human health and the environment, so long as there is no change to the use of the site.	Same as Alternative 1, except this alternative does reduce and control exposure to landfill contents. Institutional and site boundary controls would restrict access to the site, maintain current risks, and protect the landfill cover.	Same as Alternative 2. Additionally, site drainage controls would ensure the cover material at the site remains intact.
Compliance with ARARs	No chemical specific ARARs have been identified for this alternative because no COCs are present at the site. However, the substantive portions of the NPDES stormwater permit would be complied with.	Same as Alternative 1. Additionally, action-specific ARARs would apply to this alternative because actions to the site are proposed. This alternative does not meet ARARs for landfill gas if the state so requires them. It does not meet the precipitation and drainage control ARARs.	Same as Alternative 2, but this alternative also meets the ARARs for precipitation and drainage controls and landfill gas. Action-specific ARARs protective of coastal areas and to control fugitive dust will be addressed. All ARARs are addressed under this alternative.
Long-term Effectiveness and Permanence	Provides a long-term effective solution provided that the current limited use of the site continues. Risk assessments indicate no risk associated with current site usage.	Same as Alternative 1. Additionally, institutional controls proposed would control future worker exposure, thereby meeting the RAOs for the industrial worker exposure scenarios.	Same as Alternative 2. Additionally, landfill cover repair, maintenance, and drainage improvements would provide adequate drainage of surface water from IRP Site 1 to prevent ponding of surface water.
Reduction in Toxicity, Mobility, and Volume through Treatment	There are no treatment options proposed under this alternative. Consequently, this alternative will not result in a reduction in toxicity, mobility, or volume of contaminants.	Same as Alternative 1.	Same as Alternatives 1 and 2.
Short-term Effectiveness	Provides short-term protection because completed risk assessments and reports demonstrated no risk associated with the current use and condition of the isolated site. No worker exposure to contaminants is anticipated.	Same as Alternative 1. Additionally, the proposed activities would not disturb the landfill contents at the site. Short-term effectiveness is high. RAOs would be met at the completion of the alternative.	Same as Alternative 2.
Implementability	This alternative is readily implemented because no actions are required.	Alternative 2 is technically feasible and uses techniques proven to protect human health and the environment. The alternative is of minimal complexity using standard practices, normal construction procedures, and skilled labor.	Same as Alternative 2.
Cost	There are no costs associated with the no action alternative.	The total present value cost for Alternative 2 is approximately $93,000. See Appendix F for a breakdown of this total.	The total present value cost for Alternative 3 is approximately $544,000. See Appendix F for a breakdown of this total.
State Acceptance	Comments generated from state review of this FS will be considered and incorporated as necessary in the proposed plan and final ROD.	Same as Alternative 1.	Same as Alternatives 1 and 2.
Community Acceptance	Community acceptance will be evaluated after the public comment period on the proposed plan and will be documented in the final ROD.	Same as Alternative 1.	Same as Alternatives 1 and 2.

Notes:

ARAR Applicable or relevant and appropriate requirement
COC Chemical of concern
FS Feasibility study
IRP Installation Restoration Program
NPDES National Pollutant Discharge Elimination System
RAO Remedial action objective
ROD Record of Decision

- Adequacy of mitigative controls
- Reliability of mitigative controls
- Magnitude of residual risk

3.3.4 Reduction in Toxicity, Mobility, and Volume through Treatment

This evaluation criterion addresses the statutory preference for treatment options that permanently and significantly reduce toxicity, mobility, or volume of the contaminants. This preference is satisfied when treatment reduces the principal threats through the following:

- Destruction of toxic contaminants
- Reduction in contaminant mobility
- Reduction of the total mass of toxic contaminants
- Reduction of total volumes of contaminated media

Treatment is typically not practicable for landfills, given the high volume and heterogeneous nature of wastes. Treatment is not practicable for landfills that present a low-level threat (EPA 1993 and 1996). Reduction in mobility may be achieved, although not through treatment, because containment limits direct exposure pathways and may reduce mobility caused by infiltration.

3.3.5 Short-term Effectiveness

This evaluation criterion addresses the effects of the alternative during the construction and implementation phase until RAOs are met. Under this criterion, alternatives are evaluated with respect to their effects on human health and the environment during remedial action implementation. The following factors are considered:

- Exposure of the community during implementation
- Exposure of the workers during construction
- Environmental impacts
- Time required to achieve RAOs

3.3.6 Implementability

This criterion addresses the technical and administrative feasibility of implementing and alternative and the availability of various services and materials required during its implementation. The following factors are considered.

- Ability to construct the technology
- Reliability of the technology
- Monitoring considerations
- Availability of equipment and specialists
- Ability to obtain approvals from regulatory agencies

3.3.7 Cost

The cost estimate for each alternative is based on estimates of capital and operation and maintenance (O&M) costs. These costs are developed in detail in Appendix F. Capital costs consist of direct and indirect costs. Direct costs include the purchase of equipment, labor, and materials necessary to install the alternative. Indirect costs include those for engineering, financial, and other services, such as testing and monitoring. Annual O&M costs for each alternative include maintenance materials, labor, and auxiliary materials, as well as operating costs.

The cost estimates of the remedial alternatives are based on the actual costs of implementation of the containment and assessment options and remedial alternatives at other sites. The actual costs have been modified using site-specific information for IRP Site 1. Costs estimates for FSs are performed for comparative purposes and they are a poor and inappropriate measure of absolute costs. Even when costs appear to be comparable, a proper engineering cost opinion or, in the case of a design-build arrangement, a cost estimate, must be performed prior to construction. Finally, the FS cost estimate should not be used as a sole basis for allocation or planning of financing or finance mechanisms.

For the purpose of cost estimates for this FS, the post-closure O&M period is assumed to be 5 years (IRP horizon after remedial action is complete). Capital and O&M cost estimates are order-of-magnitude-level estimates and have an expected accuracy of minus 30 to plus 50 percent. Guidelines for FS cost estimates are found in the EPA's *Guide to Developing and Documenting Cost Estimates during the Feasibility Study* (EPA 2000b). According to this guidance, federal facilities receive a discount rate according to the latest update of Appendix C of the White House's Office of Management and Budget Circular A-94 entitled "Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs." Currently the rate for federal facilities is 1.9 percent for the 5-year time frame. There is no allowance for inflation. Costs for each alternative are compiled in Appendix F.

3.3.8 State Acceptance

The assessment of the state's concerns regarding the proposed remedial alternative may not be completed until comments of the RI/FS are received, but may be discussed to the extent possible in the proposed plan issued for public comment [40 CFR 300.43(e)(iii)(H)]. The state's concerns that will be assessed include the following:

- The state's position and key concerns related to the preferred alternative and other proposed alternatives
- State comments on ARARs

3.3.9 Community Acceptance

This assessment involves identifying community support for, reservations about, or opposition to various components of the alternatives. This assessment may not be completed until comments on the proposed plan are received [40 CFR 300.43(e)(iii)(I)].

The following text provides details on the three remedial alternatives with respect to the nine criteria. The detailed analysis of remedial alternative is simplified by the use of presumptive remedy approach.

The objectives of the remedial alternatives analysis for IRP Site 1 are as follows:

- Use site-specific investigation results to support selection of an appropriate remedial response action

3.4 ALTERNATIVE 1: NO FURTHER ACTION

A no-further-action alternative is required by the NCP. The no-action alternative provides a baseline against which other alternatives are compared. Under this alternative, no action would be taken to alter the landfill. No construction, operation, or maintenance of remedial measures would be required. Under the no-further-action alternative, existing actions such as general maintenance may continue.

3.4.1 Overall Protection of Human Health and the Environment

The no-further-action alternative does not eliminate, reduce, or control exposure to landfill contents or contaminated soil due to the lack of institutional controls such as land use restrictions. However, past reports and risk assessments completed for IRP Site 1 have determined that, based on the contaminant concentrations and current condition and use of the site, there are no risks associated with the site. The site in its current condition is protective of human health and there are no adverse effects to the surrounding environment associated with the site.

The no-further-action alternative currently meets the RAOs of controlling worker exposure scenarios. Under this alternative, current use of the site can continue and the alternative will remain protective of human health and the environment, so long as there is no change to the use of the site. However, due to the absence of protective controls to limit site access and to restrict future use, potential for future exposure in the event of a change in the use of the property exists.

3.4.2 Compliance with ARARs

No chemical-specific ARARs have been identified for the no-action alternative because no COCs are present at concentrations that would pose a risk to human health, ecological receptors or the environment. However, the NPDES stormwater permit would be complied with.

Action-specific ARARs do not exist for the no-action alternative because as part of the alternative no actions would be taken to address the contamination at the site.

3.4.3 Long-term Effectiveness and Permanence

The no-further-action alternative would provide a long-term effective solution for the permanent protection of human health and the environment provided that the current limited use of the site for temporary storage continues. Completed risk assessments have determined that there is no risk associated with the site based on current site use.

Without institutional controls, however, future worker exposure could not be controlled due to unrestricted land use and access. Additionally the landfill is subject to drainage conditions that threaten the integrity of the native soil cover, which, over an extended period of time, could result in contaminant transport and exposure.

3.4.4 Reduction in Toxicity, Mobility, and Volume through Treatment

The no-further-action alternative would not result in a reduction in toxicity, mobility, or volume of contaminants through the use of treatment options. Based on past reports and risk assessments completed for IRP Site 1, the toxicity of the chemicals at the site is less than the risk criteria, and chemical mobility and migration is not a concern. No contaminant treatment is proposed as part of the alternative.

3.4.5 Short-term Effectiveness

The no-further-action alternative would provide short-term protection since all completed risk assessments and reports have demonstrated that there is no risk associated with the current use and condition of the site.

3.4.6 Implementability

The no-further-action alternative is readily implemented because no actions would need to be taken.

3.4.7 Cost

There are no costs associated with the no-action alternative because there are no actions proposed.

3.4.8 State Acceptance

Comments generated from state review of this FS will be considered and incorporated as necessary in the proposed plan and final ROD.

3.4.9 Community Acceptance

Community acceptance will be evaluated after the public comment period on the proposed plan and will be documented in the final ROD.

3.5 ALTERNATIVE 2: INSTITUTIONAL CONTROLS

Under Alternative 2, actions would be taken to restrict the future land use of the site. Based on all reports and risk assessments completed to date, there is no risk associated with the current use and conditions of the site, but there are no controls in place to maintain the current site conditions. Institutional controls, such as land use restrictions, would be used to ensure that the current conditions and site use are not compromised by unexpected changes in land use. In May 1998, the California Military Environmental Coordination Committee, composed of members of the United States military and California regulatory agencies, established the "Institutional Control Protocol at Open Bases." The NBVC Regional Shore Infrastructure Plan is being developed under this protocol and will record and implement any land use controls needed.

Of particular concern at IRP Site 1 would be future use of the site that could breach the cover that currently exists and would need to be maintained. Implemented institutional controls would need to ensure that future use of the site would be restricted to current site use. IRP Site 1 has sufficient boundary controls in place. The Navy does not allow public disposal and has not allowed public access to the site for more than 1 year prior to cessation of acceptance of waste and continues to meet the substantive provisions of 27 CCR 21135[b].

3.5.1 Overall Protection of Human Health and the Environment

This alternative does not eliminate exposure to landfill contents. However, based on completed reports and assessments for IRP Site 1, there are no risks to human health and the environment associated with the current use of the site. Institutional controls and site boundary controls would restrict current and future access to the site thereby preventing any alteration to the use of the site. The proposed controls used would ensure that the existing cover and the current risk conditions are maintained. This alternative meets the worker exposure RAO scenarios.

3.5.2 Compliance with ARARs

No chemical-specific ARARs have been identified for Alternative 2 because no COCs are present at the site and investigation results indicate that there have not been contaminant releases

from the site at concentrations that would pose a risk to human health or the environment. However, the base general industrial NPDES stormwater permit would be complied with.

This alternative does not meet the action-specific ARAR for landfill gas. To meet this ARAR, ambient gas sampling would have to be performed as a remedial activity, in or out of the routine maintenance cycle. This alternative does not meet the action-specific ARAR for precipitation and drainage controls. To meet this ARAR, drainage controls would need to be implemented to prevent the ponding of surface water, infiltration, and erosion, and other site drainage problems associated with poor drainage characteristics, which may occur at the site over time.

3.5.3 Long-term Effectiveness and Permanence

Institutional controls proposed would ensure that any future use of the site would comply with the selected remedial actions and that protection of human health and the environment would not be compromised.

The landfill, however, is subject to drainage conditions that threaten the integrity of the native soil cover, which, over an extended period of time, could compromise the integrity of the landfill cover potentially resulting in contaminant transport and exposure. Landfill cover repair, maintenance, and drainage improvements would be necessary to provide adequate drainage of surface water from IRP Site 1 and to prevent ponding of surface water.

3.5.4 Reduction in Toxicity, Mobility, and Volume through Treatment

Alternative 2 would not result in a reduction in toxicity, mobility, or volume of contaminants through the use of treatment options. Based on the past reports and risk assessments completed for IRP Site 1, the toxicity of the chemicals at the site is less than the risk criteria and contaminant mobility and migration is not a concern. No contaminant treatment is proposed as part of the alternative.

3.5.5 Short-term Effectiveness

The implementation of institutional controls would not disturb the landfill contents at the site. No worker exposure to contaminants is anticipated with Alternative 2. There are no risks associated with the current use of the site and it is isolated from any communities, facility housing, or sensitive ecosystem. Short-term effectiveness is high. RAOs would be met at the completion of the alternative and would not be compromised during the completion of the alternative.

3.5.6 Implementability

Alternative 2 is technically feasible and uses demonstrated techniques that have proven to be effective at protecting human health and the environment. The alternative is of minimal

complexity consisting of implementation of standard practices and procedures. Normal skilled labor for the development of effective institutional controls would be necessary and is readily available.

3.5.7 Cost

The total cost for Alternative 2 is approximately $93,000. This estimate includes institutional controls. Costs are based on a period of performance of 5 years and present value at a 1.9 percent discount rate.

3.5.8 State Acceptance

Comments generated from state review of the FS will be considered and incorporated as necessary in the proposed plan and final ROD.

3.5.9 Community Acceptance

Community acceptance will be evaluated after the public comment period on the proposed plan and will be documented in the final ROD.

3.6 ALTERNATIVE 3: INSTITUTIONAL CONTROLS; AND LANDFILL COVER REPAIR, MAINTENANCE, AND DRAINAGE IMPROVEMENTS

Under Alternative 3, landfill cover repair, maintenance, and drainage improvements would be implemented to limit the erosion and the degradation of the existing site cover. Actions would be taken to restrict current access and future use of the site so that the site remains protective of human health and the environment. The alternative will (1) provide adequate and proper grading, cover, drainage and erosion protection, and (2) meet all potential ARARs listed in Table E-1.

Institutional controls and site boundary controls would be the same as described in Alternative 2.

Alternative 3 response action would include, where necessary, grading, adding earthen cover, characterize drainage, provide drainage structures, removing inappropriate vegetation and providing erosion protection. The landfill is currently subject to erosive conditions that threaten the long-term integrity of the existing native soil cover, and current landfill drainage conditions promote the ponding of water and infiltration through the existing cover. The existing soil cover would be cleared of vegetation and graded, with earthen material, vegetation, or chip seal added as needed to create a cover having adequate soil depth, slopes to promote proper drainage, and erosion protection. Alternative 3 will provide a cover that will be a barrier between the surface and underlying waste, and will minimize surface water transport of landfill cover material, surface water accumulation, and erosion, and prevent the exhumation of waste materials.

3.6.1 Overall Protection of Human Health and the Environment

This alternative does not eliminate exposure to landfill contents. Institutional controls, however, would restrict current and future access to the site, thereby limiting potential exposure. This alternative does meet the RAOs of controlling worker exposure scenarios.

3.6.2 Compliance with ARARs

No chemical-specific ARARs have been identified for Alternative 3 because no COCs are present at the site, and investigation results indicate that there have not been contaminant releases from the site at concentrations that would pose a risk to human health or the environment. However, the NBVC Point Mugu general industrial NPDES stormwater permit would be complied with. Construction activities resulting in the disturbance of more than 1 acre will require a separate NPDES stormwater permit for construction.

This alternative meets the action-specific ARAR for precipitation and drainage controls. Drainage controls would be implemented to prevent the ponding of surface water, infiltration, and erosion, and other site drainage problems associated with poor drainage characteristics present at the site. This alternative meets the action-specific ARAR for landfill gas. To meet this ARAR, ambient gas sampling would be performed as a remedial activity, in or out of the routine maintenance cycle. Action-specific ARARs to protect coastal areas and to control fugitive dust would be addressed during repair, maintenance, and drainage improvements.

3.6.3 Long-term Effectiveness and Permanence

Institutional controls proposed would ensure that any future use of the site would comply with the selected remedial actions and that protection of human health and the environment would not be compromised. This alternative meets the RAOs for the industrial worker exposure scenarios. Unlike Alternatives 1 and 2, this alternative addresses the long-term integrity of the soil cover, existing chip-sealed area, and all areas in the footprint of IRP Site 1.

3.6.4 Reduction in Toxicity, Mobility, and Volume through Treatment

Alternative 3 would not result in a reduction in toxicity, mobility, or volume of contaminants through the use of treatment options. Based on past reports and risk assessments completed for IRP Site 1, the toxicity of the contamination at the site is less than the risk criteria and contaminant mobility and migration are not a concern. No contaminant treatment is proposed as part of the alternative.

3.6.5 Short-term Effectiveness

The site repair, maintenance, and drainage controls would not disturb the landfill contents at the site, provided adequate measures are taken. No worker exposure to contaminants is anticipated with Alternative 3. The site is isolated from any communities, facility housing, or sensitive ecosystems. Short-term effectiveness is high. RAOs would be met at the completion of the boundary and institutional controls.

3.6.6 Implementability

Alternative 3 is technically feasible and uses demonstrated techniques that have proven to be effective at protecting human health and the environment. The alternative is of minimal

complexity consisting of general construction and implementation of standard practices. Normal construction and skilled labor would be necessary and are readily available.

3.6.7 Cost

The total cost for Alternative 3 is approximately $544,000. This estimate includes site boundary controls, institutional controls, collection of samples, cover repair, maintenance, and drainage improvements. Costs are based on a period of performance of 5 years and present value at a 1.9 percent discount rate.

3.6.8 State Acceptance

Comments generated from state review of the FS will be considered and incorporated as necessary in the proposed plan and final ROD.

3.6.9 Community Acceptance

Community acceptance will be evaluated after the public comment period on the proposed plan and will be documents in the final ROD.

3.7 COMPARATIVE ANALYSIS OF ALTERNATIVES

This section compares each alternative to the nine criteria presented in Section 3.2, and analyzes the advantages and disadvantages of each alternative.

For any alternative to be eligible for selection, it must meet the threshold criteria. The two threshold criteria are overall protection of human health and the environment and compliance with ARARs (unless an ARAR is waived). After comparison with threshold criteria, five additional criteria are used to analyze differences among alternatives. Since state and community acceptance will be assessed at a later date, they are not part of this comparative analysis. The following five modifying criteria are used for comparative analysis.

- Long-term effectiveness and permanence
- Reduction in toxicity, mobility, and volume through treatment
- Short-term effectiveness
- Implementability
- Cost

3.7.1 Threshold Criteria

Alternative 1 does not provide adequate protection of human health and the environment from exposure to landfill contents. There are no requirements in Alternative 1 for restricting access to the site and there are no requirements to prevent erosion of the landfill cover. Both inadequacies potentially result in the exposure of landfill contents compromising the protection of human health and the environment.

Alternatives 2 and 3 would provide protection of human health by restricting present and future access and land use of the site. Alternatives 1 and 2 do not provide adequate long-term protection of human health and the environment from erosion of the landfill cover and potential subsequent exposure to landfill contents.

Alternative 3 would provide protection of human health and the environment by restricting access and use of the site, and by controlling surface water runoff and erosion through modifications for drainage control.

Alternative 3 is the only alternative that meets the RAOs and complies with all the ARARs.

3.7.2 Long-term Effectiveness and Permanence

Alternatives 1 and 2 do not provide long-term effectiveness and permanence because there are potentially inadequate drainage controls at the site that are not addressed by these alternatives. Based on the past reports and risk assessments completed for IRP Site 1, there is no risk associated with the current use and conditions at the site. However, there are no measures in place to provide land use restrictions and controls to ensure that the current risk conditions at the site remain unchanged. Additionally, the lack of proper drainage from the site creates the potential for degradation of the existing site cover and increases the likelihood of future contaminant migration and exposure to human and environmental receptors. Alternative 3 incorporates drainage controls and site access and use controls that, when properly administered and adequately maintained, prevent the use of the site and limit erosion, thereby limiting contaminant migration and exposure.

Each of the three alternatives would result in constituents or materials remaining at the landfill; consequently, in accordance with CERCLA Section 121(c), “a review of the selected remedy will be completed no less that each five years after the initiation of the remedial action.” Specifically, the reviews will ensure that human health and the environment are continuing to be protected by the implemented remedial actions. As lead agency for the site, the Navy will be responsible for completing the review. Should the Navy’s review determine that additional action under CERCLA is needed, the Navy is responsible for the completion of the action.

3.7.3 Reduction in Toxicity, Mobility, and Volume through Treatment

None of the alternatives would result in a reduction in toxicity, mobility, and volume of contamination through treatment simply because no contaminant treatment has been proposed. Alternative 3 would result in a reduction in mobility due to containment enhancements and drainage modifications to the existing cover.

3.7.4 Short-term Effectiveness

Alternative 1 is highly effective since there would be no community or environmental site impacts, and the site conditions would remain unchanged. There are no foreseeable short-term impacts associated with Alternative 2. There are no foreseeable short-term impacts associated with Alternative 3. There would be minimal disturbance of the existing cover material due to the landfill cover repair, maintenance, repair, and drainage improvements. Exposure and impacts could be minimized through the use of basic site safety procedures.

3.7.5 Implementability

Alternative 1 is the easiest to implement since the site remains in its current condition. Alternatives 2 and 3 require the implementation of institutional controls that are of minimal complexity. Alternative 3 has the additional requirement to conduct landfill cover repair, maintenance, and drainage improvements.

3.7.6 Cost

Alternative 1 is the least costly of the four proposed alternatives. Alternatives 2 and 3 progressively increase in cost due to the amount of work and materials necessary for completion of each alternative.

3.7.7 State and Community Acceptance

Comments generated from state review of this FS will be considered and incorporated, as necessary, in the proposed plan and final ROD. Community acceptance will be evaluated after the public comment period on the proposed plan and will be documented in the final ROD.

3.7.8 Summary

Each of the alternatives offers protection of human health and the environment based on the current conditions and use of the site. If, however, the no-action alternative was selected and the current site use conditions were to change, the no-action alternative may not remain protective of human health and the environment into the future. Consequently, controls are necessary at the site to ensure that the current conditions and use of the site remain unchanged and that access to the site is restricted.

Maintenance of the current risk conditions at the site is proposed in Alternative 3. Alternative 2 meets the minimal requirements of maintaining the current risk conditions at the site by preventing any future land use of the site beyond current use. Addressing the drainage of the site is not necessary, but represents the most conservative approach to maintaining the current conditions at the site. Therefore, Alternative 3 includes minimal site drainage improvements, repair, and maintenance. Alternative 3 also meets the RAOs of protecting worker exposure and is the only proposed alternative that complies with all of the identified ARARs.

The Navy believes that state and community input is essential to select a remedial alternative. Input will be collected after the alternatives are presented to the public, and a final decision will be made after review of state and community input.

4.0 SUMMARY OF EVALUATION

This FS is prepared consistent with the CERCLA requirements defined in EPA and Navy guidance documents. The purpose of this FS is to develop and evaluate candidate remedial alternatives to address soil and groundwater contaminants at IRP Site 1. A number of process options were screened with respect to effectiveness, implementability, and cost, to identify components to formulate four candidate remedial alternatives as follows:

- Alternative 1: No Further Action
- Alternative 2: Institutional Controls
- Alternative 3: Institutional Controls; and Landfill Cover Repair, Maintenance, and Drainage Improvements

Of the first seven CERCLA criteria (Section 3.0), only Alternative 3 meets all criteria and is therefore the recommended alternative.

Reader's Guide

1. Landfill was already closed (in 1975) in accordance with existing requirements.
2. Site 1 has minimal and acceptable human health risk for industrial scenario.
3. Site 1 has minimal and acceptable ecological risk including present and long-term groundwater impacts.
4. Landfill meets Title 27 definitions as a "Closed Site" and "Closed, Abandoned, or Inactive (CAI) Unit."
5. **Recommended Action: Maintain successful closure at Site 1.**

5.0 REFERENCES

Battelle. 2002. "Point Mugu IRP Site 1 Lagoon Landfill Groundwater Evaluation Summary Report." October 28.

California Department of Water Resources. 1965. *Sea-Water Intrusion.* Oxnard Plain of Ventura County, Bulletin No. 63- 1. October.

California Environmental Protection Agency (Cal/EPA). 1994. *Draft Update, Water Quality Control Plan, Los Angeles Region 4, Santa Clara River and Los Angeles River Basins*. Regional Water Quality Control Board (RWQCB), Los Angeles Region. April.

DWR, see California Department of Water Resources.

Freeze, R.A., and J.A. Cherry. 1979. *Groundwater.* Prentice-Hall, Inc.: Englewood Cliffs, New Jersey.

Fugro-McClelland. 1991. *Final Draft Site Inspection Report for Naval Air Station Point Mugu, California*. October.

Hem, J.D. 1992. *Study and Interpretation of the Chemical Characteristics of Natural Water*. U.S. Geological Survey Water-Supply Paper No. 2254.

McBean, Rovers, and Farquhar. 1995. *Solid Waste Landfill Engineering and Design*. Prentice Hall PTR: Englewood Cliffs, New Jersey.

Montgomery-Watson Americas and Terra Soft. 1993. "Technical Report, Ground Geophysical Survey, NAWS Point Mugu, California." December 9.

Page, R.W. 1963. *Geology and Groundwater Appraisal of the Naval Air Missile Test Center Area, Point Mugu, California*. U.S. Geological Survey Water Supply Paper 1619-S. U.S. Government Printing Office, Washington, DC.

PRC and JMM. 1993a. "Storm Water Pollution Prevention Plan, Naval Air Weapons Station, Point Mugu, California." Prepared for Navy. March.

PRC and JMM. 1993b. "Final Remedial Investigation and Feasibility Study, Field Sampling Plan, Health and Safety Plan, and Quality Assurance Project Plan for Naval Air Weapons Station Point Mugu, California." Prepared for Navy. June.

PRC, Wetlands Research Associates, Tetra Tech, and MEC Analytical Systems. 1994. "Ecological Assessment Phase I Field Sampling Plan Naval Air Weapons Station, Point Mugu, California." Prepared for Navy. February 9.

Steams, Conrad, and Schmidt and Landau Associates. 1985. "Initial Assessment Study of Pacific Missile Test Center, Point Mugu, California." September.

Tetra Tech EM Inc. (Tetra Tech). 2000. "Final Phase 1 Remedial Investigation Technical Memorandum. Naval Air Weapons Station, Point Mugu, California." Prepared for Department of the Navy, Naval Facilities Engineering Command, Southwest Division, San Diego, California. March.

Tetra Tech. 2001a. "Remedial Investigation/Feasibility Study Addendum for IRP Sites 1 and 6, Naval Base Ventura County, Point Mugu Site, California. Final." Prepared for Department of the Navy, Southwest Division, San Diego, California. January.

Tetra Tech. 2001b. "Risk to Vertebrates Technical Memorandum. Naval Base Ventura County, Point Mugu Site, California." Prepared for Department of the Navy, Naval Facilities Engineering Command, Southwest Division, San Diego, California. August.

Tetra Tech. 2003. "Draft Ecological Risk Assessment Addendum for Installation Restoration Program Sites 5 and 11, Naval Base Ventura County, Point Mugu Site, California." April 28.

Tetra Tech. 2004. "Remedial Investigation for Groundwater. Naval Base Ventura County, Point Mugu Site, California." Prepared for Department of the Navy, Naval Facilities Engineering Command, Southwest Division, San Diego, California. January.

United Water Conservation District. 1998. "Monitoring of Seawater Intrusion, Oxnard Plain, 1997 Annual Report." June.

U.S. Environmental Protection Agency (EPA). 1986. *Guidelines for Ground-Water Classification under the EPA Ground-Water Protection Strategy, Final Draft.* WH-560G. Office of Ground-Water Protection. December.

EPA. 1988. *Guidance for Conducting Remedial Investigations and Feasibility Studies Under the Comprehensive Environmental Response, Compensation, and Liability Act*. EPA/540/G-89/004. October.

EPA. 1991a. *Conducting Remedial Investigations/Feasibility Studies for CERCLA Municipal Landfill Sites*. EPA/540/P-91/001. Office of Emergency and Remedial Response. February.

EPA. 1991b. "Supplement to Risk Assessment Guidance for Superfund. Standard Default Exposure Factors." Office of Solid Waste and Emergency Response Directive 9285.6-03.

EPA. 1993. *Presumptive Remedy for CERCLA Municipal Landfill Sites*, 9355.0-49FS. Office of Solid Waste and Emergency Response. September.

EPA. 1996. *Application of the CERCLA Municipal Landfill Presumptive Remedy to Military Landfills*. 9355.0-67FS. Office of Solid Waste and Emergency Response. December.

EPA. 2000a. Smucker, Stanford J., Ph.D. "Region 9 PRGs Table 2000 Update." On-line address: http://www.epa.gov/region09/waste/sfund/prg/whatsnew.htm

EPA. 2000b. *A Guide to Developing and Documenting Cost Estimates During the Feasibility Study*. EPA 540-R-00-002. OSWER 9355.0-75. July.

APPENDIX A
BACKGROUND INFORMATION

APPENDIX A
CONTENTS

A.1 LOCATION AND HISTORY A-1

A.2 REGIONAL AREA AND SETTING A-1

A.2.1 Climate A-4
A.2.2 Topography A-4
A.2.3 Geology A-6
A.2.4 Hydrogeology A-10
A.2.4.1 Hydrostratigraphy A-13
A.2.4.2 Groundwater Flow Directions A-18
A.2.4.3 Surface Water Hydrology A-23
A.2.5 Surrounding Land Use and Populations A-27
A.2.5.1 Habitat Types and Typical Species A-28
A.2.5.2 Special Status Species A-37
A.2.5.3 Linkage among Habitats A-39
A.2.5.4 Seasonal Use of Habitats A-39
A.2.6 Cultural Resources A-39

A.3 REFERENCES A-40

APPENDIX A
FIGURES

A-1 Vicinity Map A-2

A-2 Site Location A-3

A-3 Location of Oxnard Plain A-5

A-4 Mugu Lagoon and Drainage Ditches A-7

A-5 Regional Geology A-8

A-6 Stratigraphy of the Ventura Basin South of the Santa Clara River A-9

A-7. Regional Geological Cross Section A-11

A-8 Surficial Soils A-12

A-9 Hydrostratigraphy A-14

A-10 Hydrogeological Fence Diagram A-15

A-11 Groundwater Elevation Contours Upper Aquifer System Spring 1998 ..... A-19

A-12 Groundwater Elevation Contours Lower Aquifer System Spring 1998. ..... A-21

A-13 Area of Tidal Influence in Surface Water and Semi-Perched Aquifer A-26

A-14 Land Use Surrounding Point Mugu A-28

A-15 Open-Water Food Web A-30

A-16 Tidal Marsh Food Web A-31

A-17 Intertidal Mudflat Food Web A-31

A-18 Upland Food Web A-32

APPENDIX A
TABLES

A-1 Special Status Species at NBVC Point Mugu A-38

APPENDIX A
BACKGROUND INFORMATION

This appendix summarizes the site location and background information for Naval Base Ventura County (NBVC) Point Mugu. The appendix is divided into three sections. Section A.1 provides a brief overview of NBVC location and history; Section A.2 describes the climate, topography, geology, hydrogeology, and ecological setting; and references cited throughout the appendix are listed in Section A.3.

A.1 LOCATION AND HISTORY

Naval Base Ventura County Point Mugu is located in Ventura County, California, about 50 miles northwest of Los Angeles (see Figure A-1). It is bordered by Highway 1 on the north and east, by the Pacific Ocean on the south and west, and by the Ventura County Game Reserve on the west and northwest, as shown in Figure A-2.

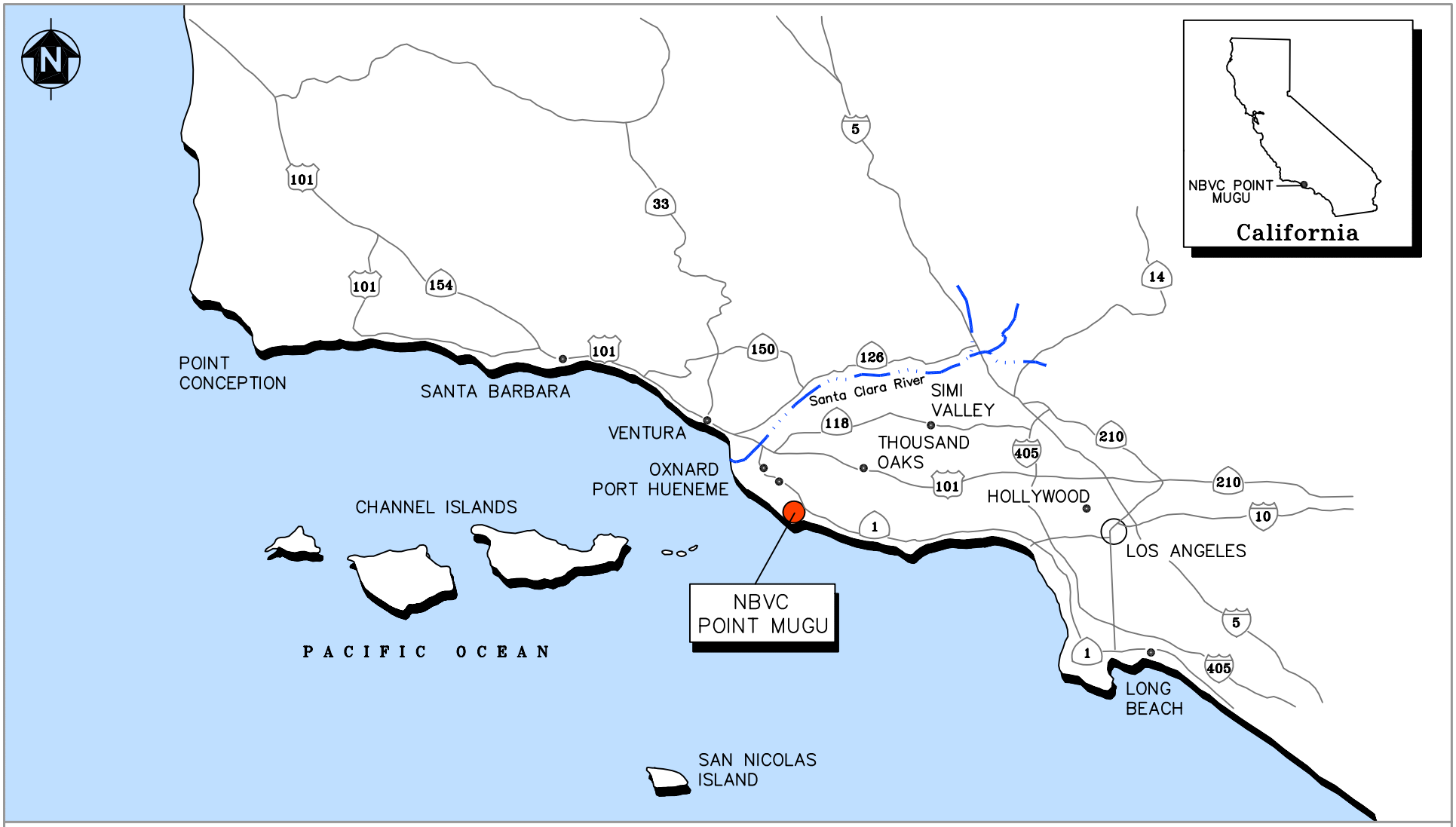
The Navy established temporary facilities at Point Mugu in 1944, and has conducted operations there since 1945. In 1946, the Naval Air Missile Test Center was commissioned at Point Mugu, and in 1949, the U.S. Naval Air Station was commissioned at this location. The Pacific Missile Test Range was established in 1957, and was renamed the Pacific Missile Test Center in the mid-1970s. In 1993, the names were revised again: the Pacific Missile Test Center became the Naval Air Warfare Center Weapons Division; and the U.S. Naval Air Station became the Naval Air Weapons Station (NAWS). In 1998, NAWS Point Mugu merged with Navy administrative activities at Port Hueneme, and the base was renamed Naval Base Ventura County.

NBVC Point Mugu is a major center for naval weapons systems testing and evaluation. In addition, it provides range, technical, and base support for fleet users and other U.S. Department of Defense (DoD) agencies.

NBVC Point Mugu currently maintains a fleet of more than 50 aircraft, many of which are uniquely configured to support the assigned test and evaluation mission for airborne weapons and electronic warfare systems. Aircraft also are used for mobile range instrumentation, range surveillance and clearance, target launch and recovery, and logistical support. The NBVC also provides target support for the mobile sea range operation around the world and, upon request, at other test ranges that need sophisticated threat simulation support.

A.2 REGIONAL AREA AND SETTING

This section describes NBVC Point Mugu and the surrounding area, including climate, topography, geology, hydrogeology, land use, ecological characteristics, and cultural resources.



10 0 10 20

Scale In Miles

Tetra Tech EM Inc.

NBVC POINT MUGU, CALIFORNIA
U.S. Navy Southwest Division, NAVFAC, San Diego

FIGURE A-1
VICINITY MAP

Revised FS IRP Site 1
DS.A007.10571

Source: Tetra Tech 2000

2004-02-05 R:\Navy\Point Mugu\cto-368\ FIG A-1.dwg TtEMI-SA deborah.ford

LEGEND

- INSTALLATION RESTORATION PROGRAM (IRP) SITE 1
- ODD — OXNARD DRAINAGE DITCH
- DD — DRAINAGE DITCH
- WATER
- BUILDING / SURFACE IMPROVEMENT

Source: Tetra Tech 2000, 2001a

1750' 0 1750' 3500'

Scale: 1" = 3500'

Tetra Tech EM Inc.

NBVC POINT MUGU, CALIFORNIA
U.S. Navy Southwest Division, NAVFAC, San Diego

FIGURE A-2
SITE LOCATION

Revised FS IRP Site 1
DS.A007.10571

2004-02-05 R:\Navy\Point Mugu\cto-368\ FIG A-2.dwg TtEMI-SA deborah.ford

A.2.1 CLIMATE

The climate in the NBVC Point Mugu area is influenced by the coastal setting. The climate is moderately humid, with mild and moist winters and warm and dry summers (Fugro-McClelland 1991). Climatological data from the NBVC Point Mugu weather station shows an average annual temperature of the NBVC as 59.3°F (Fisk and Cohenour 1993). The average minimum monthly temperature ranges from 44.5°F in January to 58.5°F in August. The average maximum monthly temperature ranges from 63.6°F in January to 73.0°F in September. The average monthly humidity ranges from a minimum of 64 percent to a maximum of 82 percent.

Ninety-two percent of the rain at NBVC Point Mugu falls between the months of November and April (Steffen 1982). The average annual precipitation is 11.84 inches. The minimum monthly average, 0.01 inches, occurs in July. The maximum monthly average, 2.72 inches, occurs in January. However, in the winter months of 1997 and 1998, NBVC Point Mugu received 31.81 inches of rain, more than 300 percent of the normal rainfall for the area. The 100-year, maximum 24-hour rainfall at NBVC Point Mugu is 5.05 inches (Fisk and Cohenour 1993).

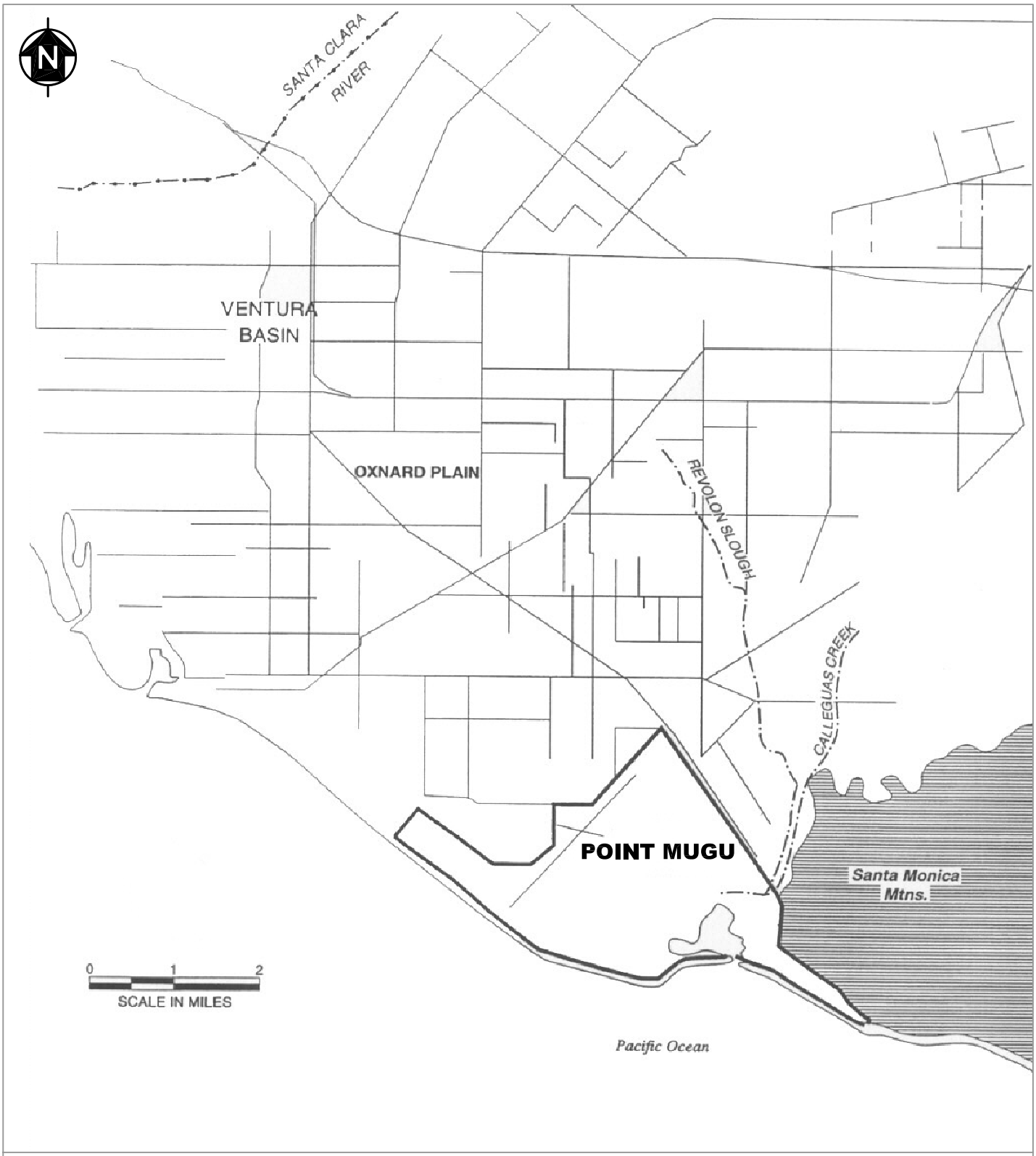
Wind speeds and directions at NBVC Point Mugu show clear seasonal variations. From March through September, westerly to northwesterly onshore winds are dominant from mid-morning through early evening (Fisk and Cohenour 1993). Nighttime and early morning breezes are very weak. The onshore summer winds are typically 4 to 10 knots, but can be significantly stronger in March, April, and May. From October through February, moderate, northeasterly, offshore winds of 4 to 10 knots are typical during the night and morning. In the afternoon, these winds change to become somewhat stronger, westerly, onshore winds.

A.2.2 TOPOGRAPHY

NBVC Point Mugu is located in the southern part of the Oxnard Plain, which is part of the Ventura Basin (see Figure A-3). The Oxnard Plain is generally flat, with a slight increase in elevation inland (northward). The Santa Monica and Santa Ynez Mountains, which form the eastern and northern boundaries of the Ventura Basin, rise abruptly from the Oxnard Plain to elevations of more than 1,000 feet.

Like the Oxnard Plain, the ground surface at NBVC Point Mugu is relatively flat, with elevations predominantly ranging from sea level to about 11 feet above mean sea level (msl) (Stearns, Conrad, and Schmidt [SCS] and Landau Associates 1985). At one isolated area in the south-central part of the NBVC, the elevation rises to about 26 feet above msl.

The most prominent surface water body at NBVC is a portion of Mugu Lagoon, which occupies about 311 acres in the southern part of the base. The lagoon's 1,445 acres comprise intertidal flats, salt marsh, and salt ponds. Mugu Lagoon consists of two arms, the east and the west arms, that project out from a broader, central basin. The boundaries of the lagoon vary seasonally and are also heavily influenced by tidal levels and the quantity of fresh water entering from Calleguas Creek, Revolon Slough, and other tributaries, such as the Oxnard drainage ditches.



BASE BOUNDARY

Tetra Tech EM Inc.

NBVC POINT MUGU, CALIFORNIA
U.S. Navy Southwest Division, NAVFAC, San Diego

FIGURE A-3
LOCATION OF OXNARD PLAIN

Revised FS IRP Site 1
DS.A007.10571

Source: Modified from Jennings and Strand 1969, and Ventura County Division of Water Resources 1953.

2004-02-05 R:\Navy\Point Mugu\cto-368\ FIG A-3.dwg TtEMI-SA deborah.ford

Mugu Lagoon is generally less than 10 feet deep at high tide. Circulation patterns within the lagoon are characterized by slow water mixing and flushing rates in the extreme western part of the lagoon, and moderate to fast mixing and flushing rates in the eastern and central parts of the lagoon. Flushing rates are determined by tidal influence and the quantity of fresh water entering the lagoon from Calleguas Creek, Revolon Slough, and other tributaries, such as the Oxnard drainage ditches (McClelland Consultants [West], Inc. 1990).

Mugu Lagoon receives sediment from its tributaries and from tidal action. The estimated average annual sediment yield to Mugu Lagoon from Calleguas Creek is 240,000 tons (U.S. Department of Agriculture [USDA] Soil Conservation Service and Forest Service 1994). Sedimentation rates increase during storms, because runoff increases flows in Calleguas Creek and other tributaries. Prior to 1884, however, land-derived sediments contributed little to the lagoon, and the area probably resembled a coastal marine marsh.

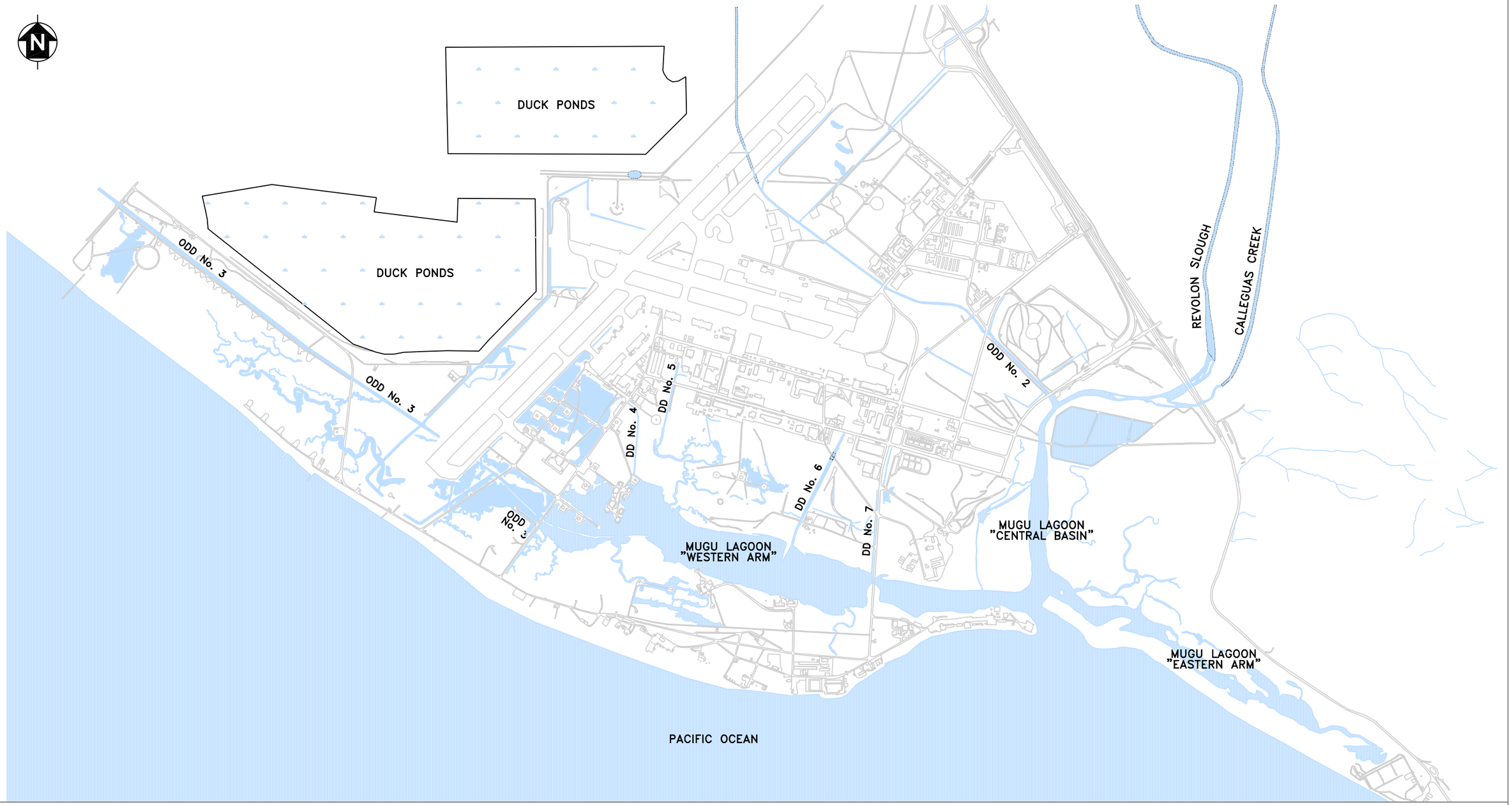
In 1884, after crop agriculture was established on the Oxnard Plain, Calleguas Creek was channelized, and its flow was diverted into the lagoon (Onuf 1987). The present configuration of Mugu Lagoon (see Figure A-4) results from the channelization and diversion of Calleguas Creek. In addition, some parts of the lagoon were filled to construct NBVC facilities, and the central part of the lagoon, near the mouth of Calleguas Creek, was dredged (SCS and Landau Associates 1985).

In 1992, extreme westward erosion of the barrier sand spit near the mouth of the lagoon occurred. This erosion modified the lagoon shoreline in areas that were previously protected from wave action. Increased sedimentation in the eastern part of the central basin caused a lengthening of the eastern arm of the lagoon (Navy 1993). In addition, winter storms in January and February 1995 altered the bathymetry of the southern part of the western area of the lagoon and the configuration of the mouth of the lagoon.

A.2.3 GEOLOGY

NBVC Point Mugu lies at the southern end of Ventura Basin, a sedimentary basin located within the Transverse Ranges geomorphic province. Figure A-5 is a geological map of Ventura Basin. The Transverse Ranges province consists of highlands, basins, and east-west-trending folds that resulted from regional strike-slip and thrust faulting (Mukae and Turner 1975; Fugro-McClelland 1991).

The Ventura Basin lies immediately west of the foot of the Santa Monica Mountains, which are composed of Miocene-age volcanic and marine deposits of the Topanga Formation. The basin is filled with more than 40,000 feet of sediments, composing a broad coastal lowland, the Oxnard Plain. Figure A-6 presents the stratigraphy of the Ventura Basin south of the Santa Clara River. As shown in Figure A-5, most of the Oxnard Plain is covered in upper Pleistocene and Holocene alluvium, which is composed of unconsolidated water-bearing sediments.



1000' 0 1000' 2000'

Scale: 1" = 2000'

LEGEND

ODD OXNARD DRAINAGE DITCH

DD DRAINAGE DITCH

Source: Tetra Tech 2000

Tetra Tech EM Inc.

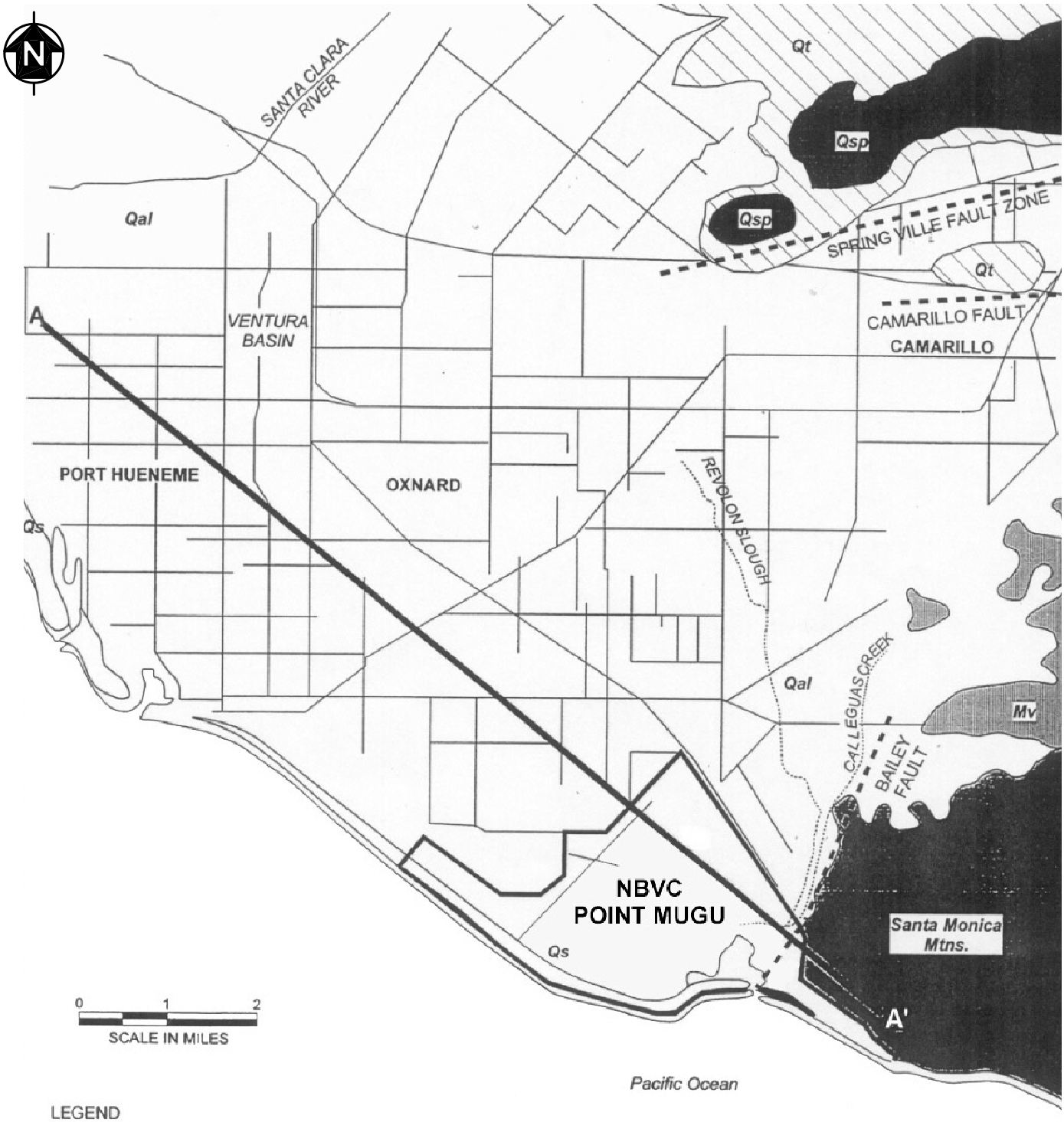
NBVC POINT MUGU, CALIFORNIA

U.S. Navy Southwest Division, NAVFAC, San Diego

FIGURE A-4
MUGU LAGOON
AND DRAINAGE DITCHES

Revised FS IRP Site 1
DS.A007.10571

2004-02-05 R:\Navy\Point Mugu\cto-368\ FIG A-4.dwg TtEMI-SA deborah.ford



LEGEND

Qal		QUATERNARY ALLUVIUM
Qs		QUATERNARY DUNE SAND
Qt		QUATERNARY TERRACES
Qsp		LOWER PLEISTOCENE (SAN PEDRO FORMATION)
Mtp		LOWER TO MIDDLE MIOCENE (TOPANGA FORMATION)
Mv		MIOCENE VOLCANICS
		PROBABLE CONCEALED FAULT
		BASE BOUNDARY
A — A'		LOCATION OF CROSS SECTION FOR FIGURE A-7

Source: Modified from Jennings and Strand 1969, and Ventura County Division of Water Resources 1953.

Tetra Tech EM Inc.

NBVC POINT MUGU, CALIFORNIA
U.S. Navy Southwest Division, NAVFAC, San Diego

FIGURE A-5
REGIONAL GEOLOGY

Revised FS IRP Site 1
DS.A007.10571

2004-02-05 R:\Navy\Point Mugu\cto-368\ FIG A-5.dwg TtEMI-SA deborah.ford

Age			Description
QUATERNARY	HOLOCENE		ALLUVIUM (Qal). Interbedded layers and lenses of fluvial sand, gravel, cobbles, silt, and clay; 300 to 500 feet thick.
QUATERNARY	PLEISTOCENE	UPPER	TERRACE DEPOSITS (Qt). Marine and continental gravel, sand, and clay thickness.
QUATERNARY	PLEISTOCENE	LOWER	SAN PEDRO FORMATION (Qsp). Marine and fluvial sand, gravel, silt, and clay; 600 to 1,800 feet thick.
QUATERNARY	PLEISTOCENE	LOWER	SANTA BARBARA FORMATION (PQsb). Marine silt, clay, sand, and gravel; 800 to 2,000 feet thick.
TERTIARY	PLIOCENE		PICO FORMATION (Pp). Marine sandstone and shale with lenses of conglomerate; 0 to 12,000 feet thick.
TERTIARY	MIOCENE		SANTA MARGARITA and MODELO FORMATIONS (Mmsh, Mms). Marine shale and sandstone; 2,000 to 6,500 feet thick.
TERTIARY	MIOCENE		VOLCANICS (Mv). Basalt flows and agglomerates with some interbedded sediments; up to 13,000 feet thick.
TERTIARY	MIOCENE		TOPANGA FORMATION (Mtp). Marine sandstone, conglomerate, and shale, and associated volcanics; 6,000 to 9,000 feet thick.
TERTIARY	MIOCENE		Unknown

-------- Unconformity.

Tetra Tech EM Inc.

NBVC POINT MUGU, CALIFORNIA
U.S. Navy Southwest Division, NAVFAC, San Diego

FIGURE A-6
STRATIGRAPHY OF THE VENTURA BASIN SOUTH OF THE SANTA CLARA RIVER

Revised FS IRP Site 1
DS.A007.10571

Source: Tetra Tech 2000

R:\Navy\Pt. Mugu\cot-368\FIG A-6.dsf DN deborah.ford

A probable concealed fault, the Bailey Fault, is interpreted to separate the Ventura Basin from the Santa Monica Mountains. The fault is thought to be located along the approximate axis of Calleguas Creek, which runs along the foot of the Santa Monica Mountains (Fugro-McClelland 1991). The alluvium is underlain by additional unconsolidated water-bearing soils and sediments called the San Pedro Formation (lower Pleistocene) and the Santa Barbara Formation (lower Pleistocene to Pliocene). The total thickness of these unconsolidated sediments ranges from 600 feet at NBVC Point Mugu to more than 2,000 feet near the Santa Clara River. Beneath the unconsolidated sediments are thousands of feet of consolidated sediments and volcanics, as shown in Figure A-6.

Ventura Basin has been subjected to periods of deformation and erosion throughout its history. It contains several unconformities, as indicated in Figure A-6. Figure A-7 shows a generalized geologic cross section of the Oxnard Plain from NBVC Point Mugu northwest toward Ventura, California.

The unconsolidated Pleistocene to Holocene sediments in the vicinity of NBVC Point Mugu range from 900 to 2,300 feet thick and consist of alluvial clays, silts, sands, and gravels. The deposits occur as both laterally continuous layers and lenticular beds. The uppermost soils and sediments lie between the surface and 85 to 135 feet below ground surface (bgs). They consist primarily of sand, silt, and clay.

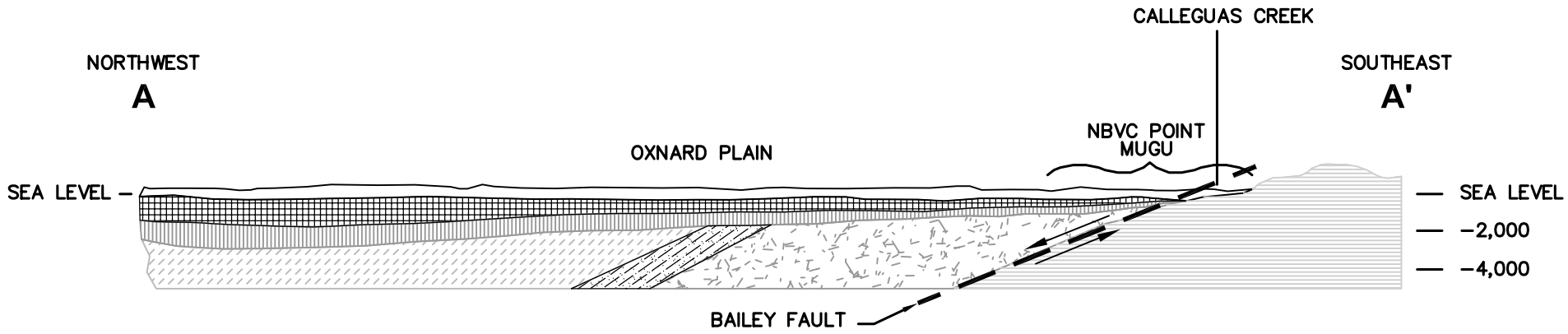
The shallow soils and sediments at NBVC Point Mugu were deposited in stream and tidal lagoon environments, including river, stream, and creek channels and bars; deltaic mud flats, ponds, and channels; and tidal lagoon marshes and ponds. Soils and sediments are virtually indistinguishable at NBVC Point Mugu, except for their current locations and organic material content. Historic depositional areas have shifted numerous times, and soils and sediments are intermingled.

Geomorphic features at NBVC Point Mugu include 290 acres of ocean beach and dunes; 311 acres of subtidal lagoons, ponds, and channels; 123 acres of intertidal flats; and 1,011 acres of salt marsh and salt ponds. The remaining acres are open space and developed areas.

Much of the land of NBVC Point Mugu was formed from mechanically compacted fill material. The distribution of surficial soils is shown in Figure A-8. Fill material underlies most of the developed areas of NBVC. The thickness and composition of fill materials vary widely (Fugro-McClelland 1991).

A.2.4 HYDROGEOLOGY

This section discusses the hydrostratigraphy, groundwater flow directions, groundwater discharge and recharge, seawater intrusion of the aquifer systems of the Oxnard Plain and NBVC Point Mugu, and the relationships among the aquifers. It also discusses surface water hydrology.



NOT TO SCALE

Qal	QUATERNARY ALLUVIUM	Mmsh	MIOCENE (SANTA MARGARITA AND MODELO FORMATION)
Qsp	LOWER PLEISTOCENE (SAN PEDRO FORMATION)	Mtp	LOWER TO MIDDLE MIOCENE (TOPANGA FORMATION)
PQsb	LOWER PLEISTOCENE TO PLIOCENE (SANTA BARBARA FORMATION)	Mv	MIOCENE VOLCANICS
Pp	PLIOCENE (PICO FORMATION)		BAILEY FAULT (ARROWS INDICATE RELATIVE DISPLACEMENT)

Note:
Cross-Section Line A-A' is Presented On Figure A-5.

Source: Modified from Ventura County Division of Water Resources 1953

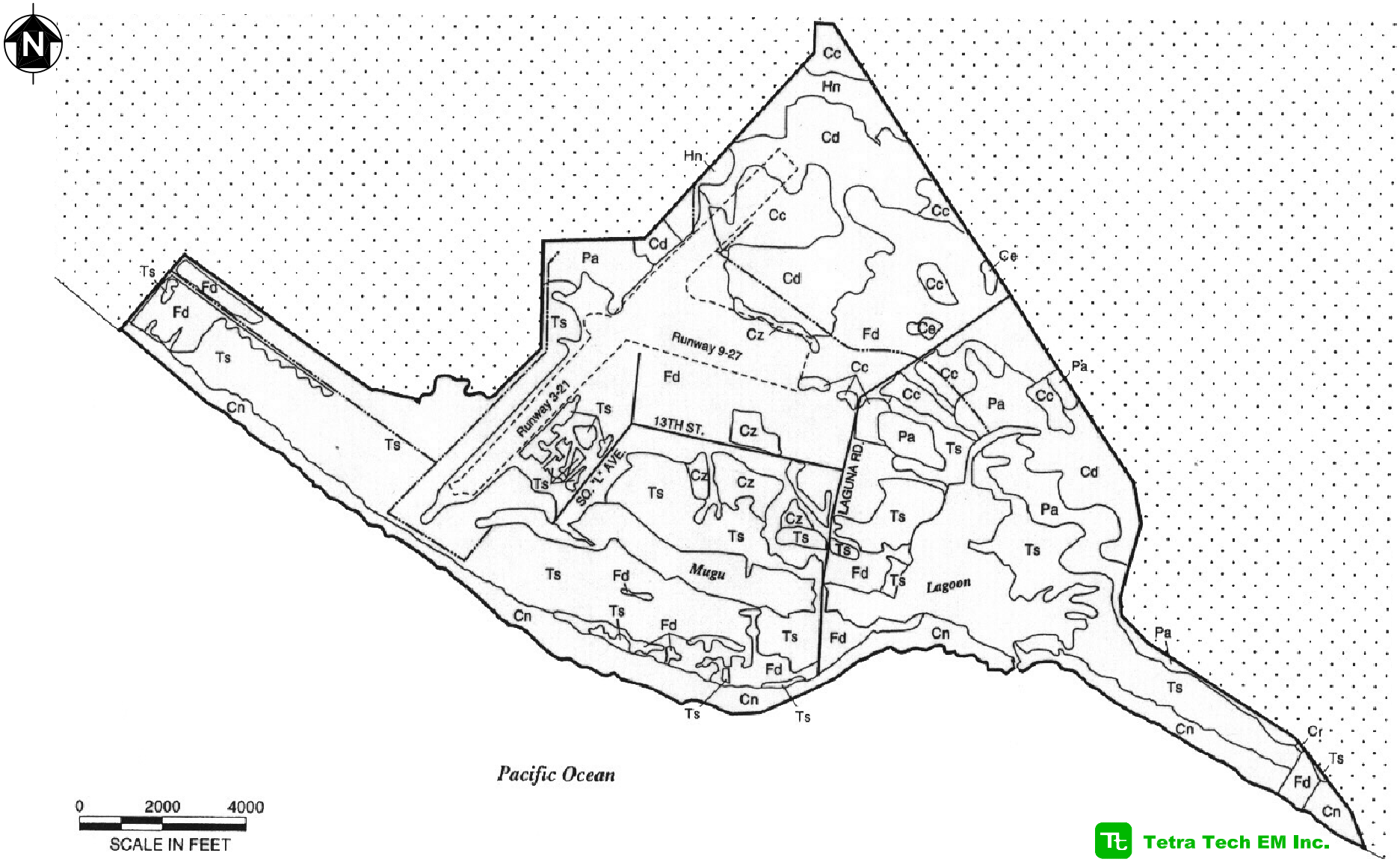
Tetra Tech EM Inc.

NBVC POINT MUGU, CALIFORNIA
U.S. Navy Southwest Division, NAVFAC, San Diego

FIGURE A-7
REGIONAL GEOLOGICAL CROSS SECTION

Revised FS IRP Site 1
DS.A007.10571

2004-02-05 R:\Navy\Point Mugu\cto-368\ FIG A-7.dwg TtEMI-SA deborah.ford



Tetra Tech EM Inc.

NBVC POINT MUGU, CALIFORNIA
U.S. Navy Southwest Division, NAVFAC, San Diego

LEGEND

- Private/Public Land
- Base Property

Cc	Camarillo Sandy Loam
Cd	Camarillo Loam
Ce	Camarillo Loam, sandy substratum
Cn	Coastal Beaches
Cr	Cortina Stony Sandy Loam
Cz	Cropley Clay, calcareous variant
Fd	Fill Land
Hn	Huenerne Sandy Loam
Pa	Pacheco Silty Clay Loam
Ts	Tidal Flats

Source: Modified From Fugro-McClelland 1991

FIGURE A-8
SURFICIAL SOILS

Revised FS IRP Site 1
DS.A007.10571

2004-02-05 R:\Navy\Point Mugu\cto-368\ FIG A-8.dwg TtEMI-SA deborah.ford

A.2.4.1 Hydrostratigraphy

Six aquifers have been identified within Pleistocene- to Holocene-age deposits in the Ventura Basin. In order of increasing depth, they are the unconfined aquifer, the Oxnard, the Mugu, the Hueneme, the Fox Canyon, and the Grimes Canyon aquifers. The shallow, unconfined aquifer is called the "semiperched aquifer." The aquifers are separated by aquitards that are leaky and discontinuous across the Ventura Basin (SCS and Landau Associates 1985). Together, the Oxnard and the Mugu aquifers form the upper aquifer system. The Hueneme, the Fox Canyon, and the Grimes Canyon aquifers comprise the lower aquifer system.

Figure A-9 presents the hydrostratigraphy of the five aquifers beneath NBVC Point Mugu. The Hueneme aquifer is absent from beneath NBVC Point Mugu (SCS and Landau Associates 1985). Figure A-10 is a fence diagram showing the various hydrogeologic cross sections at NBVC Point Mugu. It is based on the interpretation of the stratigraphic and water level data from the wells in the upper and lower aquifer systems.

Semi-perched Aquifer

The shallow, unconfined aquifer is contained within Holocene-age deposits. It extends from the water table to an average depth of 75 feet bgs over most of the Oxnard Plain (SCS and Landau Associates 1985). It is composed of fluvial deposits of sand and gravel interbedded with silt and clay (California Department of Water Resources [DWR] 1965). Groundwater quality in the semi-perched aquifer is low because of high total dissolved solids and is considered to be of no beneficial use.

Within the Oxnard Plain, the semi-perched aquifer is separated from the Oxnard aquifer by an aquitard called the "clay cap." This aquitard consists of silt and clay with lenses of fine- to medium- grained sand. The thickness of the clay cap generally ranges between 10 and 100 feet thick. Within the Ventura Basin, it attains a maximum thickness of 160 feet. Generally, this aquitard is of low permeability, although zones of relatively high permeability may exist and allow downward groundwater flow (DWR 1965).

At NBVC Point Mugu, the semi-perched aquifer extends from the water table (about 2 to 10 feet bgs) to the top of the clay cap aquitard. This aquitard separates the unconfined aquifer from the underlying Oxnard aquifer. The depth to the top of the aquitard ranges from about 85 to 135 feet bgs.

The semi-perched aquifer consists of layered sands, silts, and clays. Lithologic logs of U.S. Geological Survey (USGS) well borings (Tetra Tech 1998) show the aquitard that separates the unconfined aquifer from the Oxnard aquifer as a silt and clay layer that may be up to 20 feet thick. However, cone penetrometer testings (Tetra Tech 1998) show the aquitard to be 20 to 40 feet thick.

Age			Description of Hydrogeologic Units		Corresponding Stratigraphic Units
QUATERNARY	HOLOCENE		SHALLOW UNCONFINED AQUIFER. Referred to as the "semiperched aquifer." Interbedded layers and lenses of sand, gravel silt, and clay; 85 to 135 feet thick.		ALLUVIUM (Qal)
			"CLAY CAP" AQUITARD. Silt, silty clay, and clay with some lenses of sand and gravel; 20 to 45 feet thick.		
	PLEISTOCENE	UPPER	OXNARD AQUIFER. Sand, gravel, and cobbles with lenses of clay, silty clay, and silt; 50 to 100 feet thick.	UPPER AQUIFER	
			AQUITARD. Silt and clay with lenses of sand and gravel 50 to 100 feet thick.		
			MUGU AQUIFER. Sand and gravel with interbedded silt and clay 25 to 250 feet thick.		TERRACE DEPOSITS
		LOWER	AQUITARD. Silt and clay with some sand; 50 to 300 feet thick.	LOWER AQUIFER	
			HUENEME AQUIFER (absent at NBVC Point Mugu), FOX CANYON AQUIFER, and GRIMES CANYON AQUIFER. Marine sand and gravel; unknown thickness.		SAN PEDRO FORMATION (Qsp)
					SANTA BARBARA FORMATION (PQsb)
TERTIARY	PLIOCENE		Undifferentiated.		PICO FORMATION (Pp)

NOTE: Shaded cells represent aquitards for clarity.

Tetra Tech EM Inc.

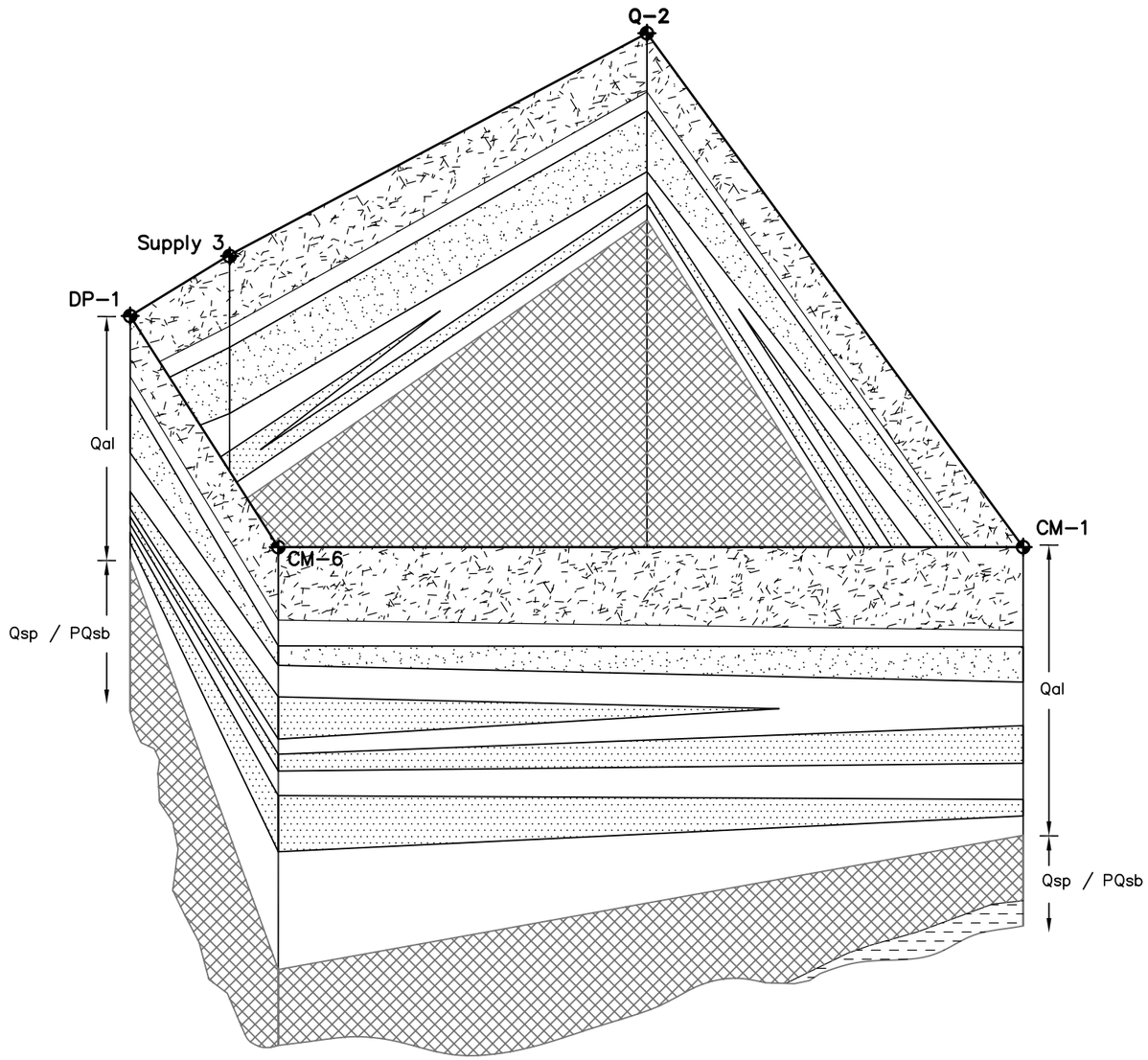
NBVC POINT MUGU, CALIFORNIA
U.S. Navy Southwest Division, NAVFAC, San Diego

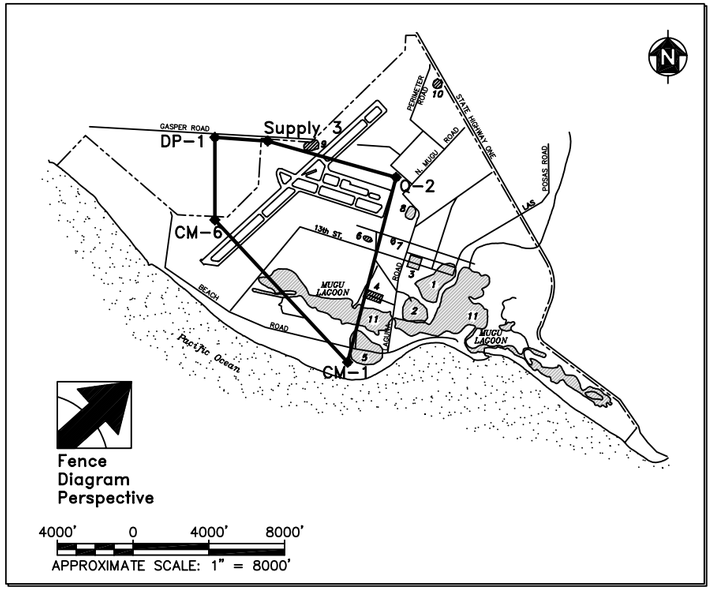
FIGURE A-9
HYDROSTRATIGRAPHY OF NBVC POINT MUGU

Revised FS IRP Site 1
DS.A007.10571

Source: Tetra Tech 2000

R:\Navy\Pt. Mugu\cot-368\Fig A-9.dsf DN deborah.ford





HORIZONTAL SCALE IN FEET

0 1,000 2,000

VERTICAL SCALE IN FEET

0

125

250

VERTICAL EXAGGERATION = 12x

WELLS USED IN FENCE DIAGRAM CONSTRUCTION

SEMI-PERCHED AQUIFER

OXNARD AQUIFER

MUGU AQUIFER

FOX CANYON & GRIMES CANYON AQUIFER

BASALT

Source: PRC Environmental Management, Inc.1995b

Qal	QUARTERNARY ALLUVIUM
Qsp	LOWER PLEISTOCENE (SAN PEDRO FORMATION)
PQsb	LOWER PLEISTOCENE TO LOWER PLIOCENE (SANTA BARBARA FORMATION)

Tetra Tech EM Inc.

NBVC POINT MUGU, CALIFORNIA
U.S. Navy Southwest Division, NAVFAC, San Diego

FIGURE A-10
HYDROGEOLOGICAL FENCE DIAGRAM

Revised FS IRP Site 1
DS.A007.10571

2004-02-05 R:\Navy\Point Mugu\cto-368\ FIG A-10.dwg TtEMI-SA deborah.ford

The aquitard that separates the unconfined aquifer from the Oxnard aquifer is likely to be both laterally and vertically discontinuous in some areas. Therefore, the unconfined and the Oxnard aquifers may be in hydraulic communication. However, data on water level, geochemistry, and stable isotopes, as well as hydraulic conductivity, collected during the remedial investigation for groundwater (RIG) (Tetra Tech 2004) showed reasonable separation between the aquifers. The hydraulic conductivity values, for example, were on the order of 10^{-7} centimeters per second (cm/sec).

Oxnard Aquifer

The Oxnard aquifer is a confined aquifer located between 100 and 330 feet bgs. It is the principal aquifer beneath Oxnard Plain and a major producer of high-quality groundwater. As recently as the early 1990s, however, seawater intrusion was induced in the aquifer by pumping. New facilities and management practices have slowed, and even repelled, intrusion in some areas. The recent recovery, however, is not an assurance that the landward migration of seawater will not recur if groundwater extraction exceeds recharge (United Water Conservation District [UWCD] 1996 and 1998).

The Oxnard aquifer consists of Holocene-age fine- to coarse-grained sand and gravel. Interbedded silt and clay layers separate the aquifer into several zones. The Oxnard aquifer is generally separated from the underlying Mugu aquifer by an aquitard consisting of silt and clay of very low permeability. This aquitard ranges in thickness from 10 to 100 feet across the Oxnard Plain (DWR 1965).

In the northern part of the Oxnard Plain, just south of the Santa Clara River, in an area called the Oxnard Plain Forebay, the clay cap aquitard that separates the Oxnard aquifer and the unconfined aquifer is absent. Consequently, the Oxnard aquifer and the unconfined aquifer are hydraulically connected in this area.

At NBVC Point Mugu, the Oxnard aquifer is a confined aquifer located between about 125 and 175 feet bgs. It ranges between about 35 and 115 feet in thickness, as estimated from resistivity data and lithologic logs from USGS well borings (Tetra Tech 1998). The Oxnard aquifer is separated from the Mugu aquifer by a low-permeability aquitard that consists of silt and clay and that ranges in thickness from about 35 to 100 feet thick.

Mugu Aquifer

The Mugu aquifer is a confined aquifer within upper Pleistocene-age deposits. It is located about 300 to 500 feet bgs. The aquifer is about 200 feet thick and is characterized by fine- to coarse-grained sand and fine gravel with local interbedded silt and clay. The aquifer has moderate to high hydraulic conductivity, and water supply wells have been completed in this aquifer near NBVC Point Mugu. Beneath the Mugu aquifer is an aquitard of silt and clay up to 200 feet thick (Fugro-McClelland 1991).

The Mugu aquifer consists of one to three confined aquifer zones at different parts of NBVC Point Mugu. Each of the zones has a different hydraulic head (Tetra Tech 1998). The zones are found at about 275 to 340 bgs in the northern part of NBVC Point Mugu (one aquifer zone) and at about 275 to 315 feet bgs in the southwest part (three aquifer zones). Low-permeability layers of silt and clay separate the zones.

At NBVC Point Mugu, the Hueneme aquifer is absent. The Mugu aquifer is separated from the Fox Canyon aquifer by a low-permeability aquitard consisting of silt and clay and ranging in thickness from about 35 to 200 feet thick.

Hueneme Aquifer

The Hueneme aquifer is generally located below the Mugu aquifer in the Oxnard Plain. It occurs between 400 and 1,500 feet bgs. However, the Hueneme aquifer is absent beneath NBVC Point Mugu.

The Hueneme aquifer is the uppermost unit of the lower aquifer system. It is composed of as much as 1,100 feet of sand, silt, and clay in the deepest part of the Ventura Basin. The thickness of the aquifer varies from 0 to 1,000 feet thick. It has been subjected to folding and erosion, which has caused it to be very thick in some places and absent in others.

Fox Canyon and Grimes Canyon Aquifers

The Fox Canyon and Grimes Canyon aquifers are confined and lie below the Hueneme aquifer. The Fox Canyon aquifer consists of 100 to 200 feet of fine- to medium-grained sand and gravel with interbedded silt and clay. The aquifer has a relatively high permeability. It is the principal lower Pleistocene aquifer.

A thin aquitard consisting of silt and clay separates the Fox Canyon aquifer from the underlying Grimes Canyon aquifer. The aquitard may not be laterally continuous, and thus may allow hydraulic continuity between the two aquifers (SCS and Landau Associates 1985). The Grimes Canyon aquifer consists of fine- to coarse-grained sand and gravel. It has a relatively high permeability. Only a few deep wells have reached the Grimes Canyon aquifer.

Turner (1975) suggests the presence of the Fox Canyon and Grimes Canyon aquifers beneath the Mugu aquifer at NBVC Point Mugu. However, two separate aquifers cannot be hydraulically distinguished using groundwater-level data from the deep-nested wells. Therefore, the aquifer zone beneath the Mugu aquifer at NBVC Point Mugu is not differentiated and is discussed as the Fox Canyon and Grimes Canyon aquifers.

The top of this aquifer zone is at a depth of about 350 feet bgs in the northern part of NBVC Point Mugu. In the Southwestern part, the top is found at about 725 feet bgs. The bottom of the Fox Canyon and Grimes Canyon aquifers is not known at NBVC Point Mugu because none of

the wells is sufficiently deep to identify the bottom boundary. In the northern part of NBVC Point Mugu, the aquifer zone is at least 600 feet thick (Tetra Tech 2001).

A.2.4.2 Groundwater Flow Directions

This section discusses the groundwater flow directions for the aquifer systems of the Oxnard Plain.

Semi-perched Aquifer

Most agricultural and municipal wells in the Oxnard Plain are completed in the upper and lower aquifer systems. Therefore, information on the regional groundwater flow of the shallow, unconfined aquifer is limited.

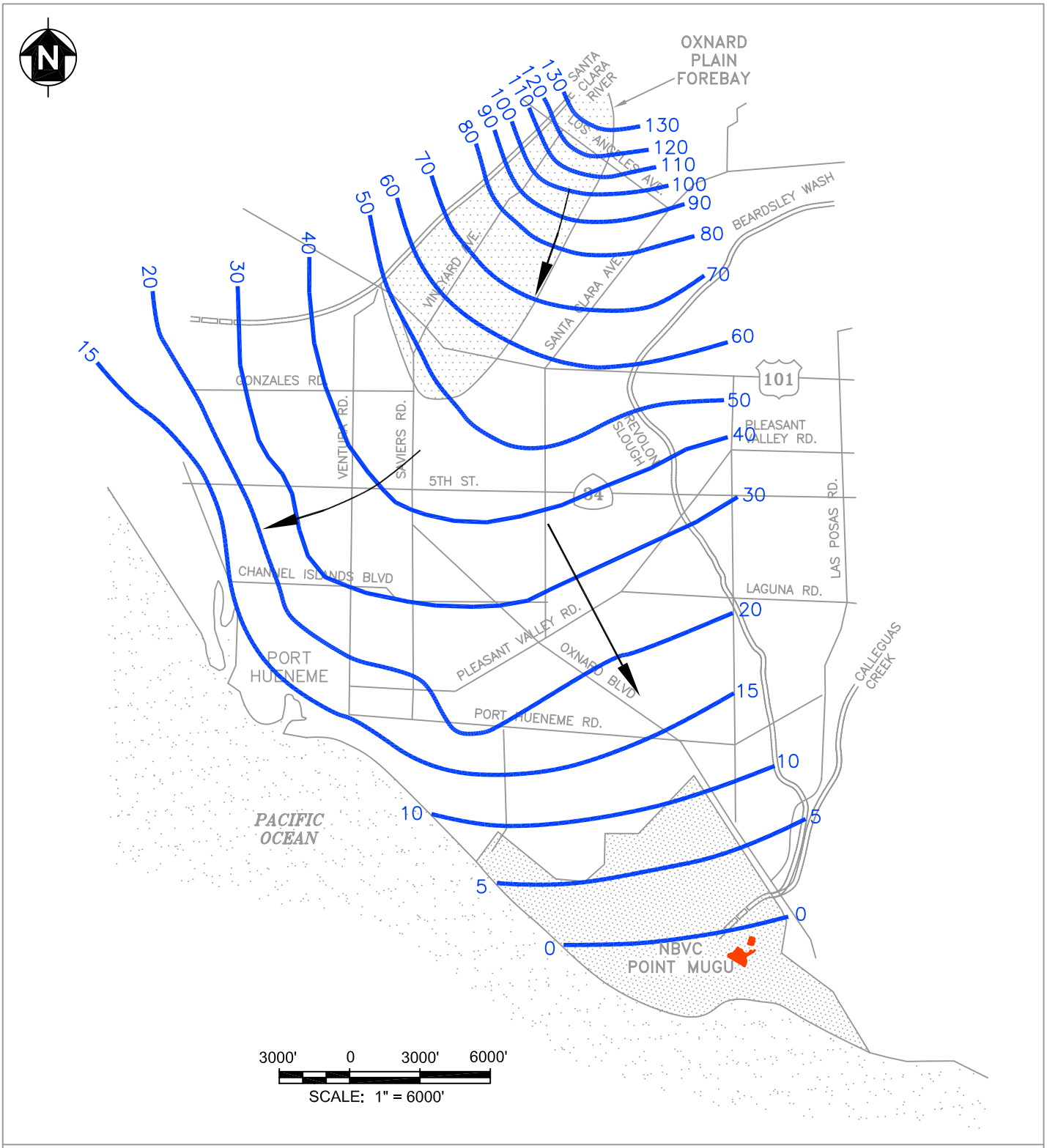
At NBVC Point Mugu, groundwater in the semi-perched aquifer generally flows to the north-northeast in the northwestern half of the NBVC, and to the east-by-southeast, toward Mugu Lagoon, in the remainder of NBVC. Typical groundwater elevations range from 0.5 feet below to 2.2 feet above msl. The horizontal groundwater gradient is relatively flat in the central part of the NBVC, and becomes steeper as groundwater nears Mugu Lagoon and Oxnard Drainage Ditch (ODD) No. 2.

Groundwater flow in the semi-perched aquifer is influenced by tidal fluctuations, and may be influenced by groundwater extraction from the Oxnard aquifer (Fugro-McClelland 1991; PRC Environmental Management, Inc. [PRC] and James M. Montgomery, Consulting Engineers, Inc. [JMM] 1992; Tetra Tech 2001). The upper part of the semi-perched aquifer discharges primarily to surface water. Recharge of the aquifer is primarily through infiltration of precipitation.

Upper Aquifer System

The Mugu and Oxnard aquifers comprise the upper aquifer system. Figure A-11 shows the groundwater elevation contours for the upper aquifer for spring 1998. Along the coast, between Port Hueneme and NBVC Point Mugu, groundwater flow is toward the Pacific Ocean. Groundwater elevations are above sea level throughout the Oxnard Plain except in the southern area of NBVC Point Mugu.

The primary source of recharge for the Oxnard Plain groundwater basin is the unconfined northeastern part of the basin, known as the Oxnard Plain Forebay or Montaivo Basin. High water levels in the forebay exert a positive pressure on the unconfined aquifers of the Oxnard Plain, and water flows from the recharge areas toward the coast (UWCD 1998).



LEGEND

–100 GROUNDWATER ELEVATION CONTOUR (FEET ABOVE NATIONAL GEODETIC VERTICAL DATUM)

GROUNDWATER FLOW DIRECTION

INSTALLATION RESTORATION PROGRAM (IRP) SITE 1

Source: United Water Conservation District 1999

Tetra Tech EM Inc.

NBVC POINT MUGU, CALIFORNIA
U.S. Navy Southwest Division, NAVFAC, San Diego

FIGURE A-11
GROUNDWATER ELEVATION CONTOURS UPPER AQUIFER SYSTEM SPRING 1998

Revised FS IRP Site 1
DS.A007.10571

2004-02-05 R:\Navy\Point Mugu\cto-368\ FIG A-11.dwg TtEMI-SA deborah.ford

Northwest of Port Hueneme, the groundwater flows northwest, parallel to the coast. On the north end of NBVC Point Mugu, flow is radial toward a groundwater depression probably caused by pumping of groundwater from area agricultural and municipal wells.

Further north of NBVC Point Mugu, groundwater flow is generally toward the west and south-west, in the direction of the coastline and the groundwater depression. Thus, the groundwater flow in the upper aquifer system is convergent toward two locations: a groundwater depression 1 to 2 miles north of NBVC Point Mugu, and a northwest trend that is parallel to the coast, toward the city of Ventura. The flow of groundwater inland from the Pacific Ocean has probably been induced by pumping the Oxnard and Mugu aquifers.

Lower Aquifer System

The Fox Canyon and Grimes Canyon aquifers comprise the lower aquifer system in the Oxnard Plain. Figure A-12 shows the groundwater elevation surface for the lower aquifer system for spring 1998. Groundwater level contours indicate that groundwater flow between Port Hueneme and NBVC Point Mugu is generally to the southeast, parallel to the coast. A sink exists in the northeastern part of the Oxnard Plain in the Oxnard Plain Forebay. Groundwater levels remained below sea level throughout the year in the southern and eastern quadrants of the Oxnard Plain, including NBVC Point Mugu (UWCD 1998).

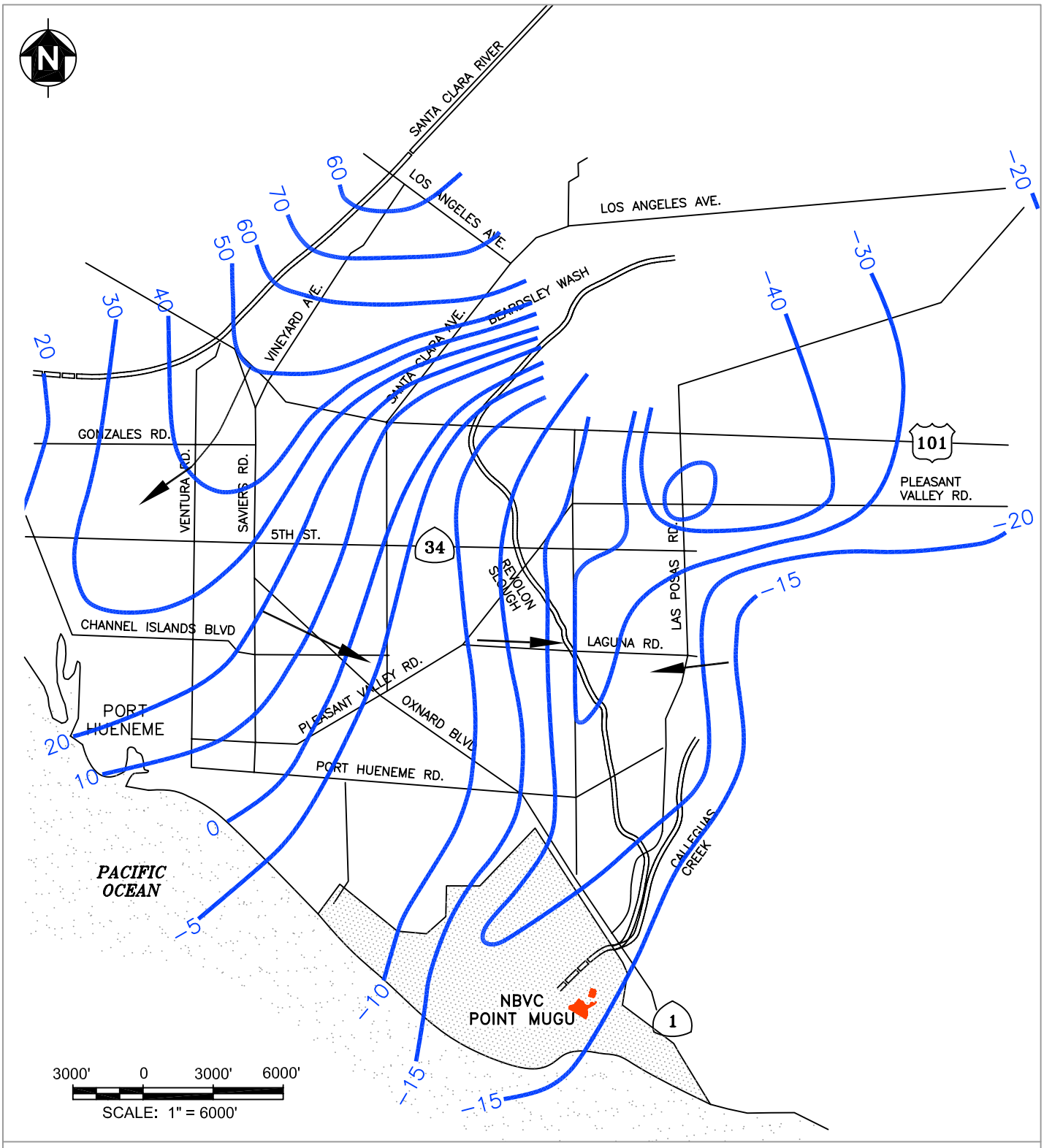
Groundwater Discharge and Recharge

Data on the shallow, unconfined groundwater across the Oxnard Plain are limited, and the discharge patterns are not well known. However, based on the remedial investigation (Tetra Tech 2001), the upper part of the shallow, unconfined aquifer discharges primarily to surface water bodies, including the Pacific Ocean, the Santa Clara River, Revolon Slough, Calleguas Creek, Mugu Lagoon, and numerous drainage ditches. Groundwater discharge of the upper and lower aquifer systems is primarily through pumping of wells.

Recharge of the shallow, unconfined aquifer is primarily through infiltration of precipitation. The upper aquifer system is also recharged by infiltration of precipitation in the Oxnard Plain Forebay, where the clay cap separating the unconfined aquifer from the upper aquifer system is absent. The upper aquifer system is also artificially recharged by diversion of water from the Santa Clara River to the Saticoy and El Rio spreading grounds located in the Oxnard Plain Forebay. This artificial recharge probably explains the higher groundwater levels in the area (see Figure A-9).

Hydraulic Relationship between the Aquifers

The unconfined aquifer and the aquifers of the upper and lower aquifer systems are separated by aquitards that are leaky (Page 1963). However, groundwater flow between the aquifers is probably minimal. The layering of fine-grained, relatively impermeable sediments with the coarser-grained, permeable sediments restricts vertical flow within the aquifer system.



LEGEND

−100	GROUNDWATER ELEVATION CONTOUR (FEET ABOVE NATIONAL GEODETIC VERTICAL DATUM)
→	GROUNDWATER FLOW DIRECTION
▭	INSTALLATION RESTORATION PROGRAM (IRP) SITE 1

Source: United Water Conservation District 1999

Tetra Tech EM Inc.

NBVC POINT MUGU, CALIFORNIA
U.S. Navy Southwest Division, NAVFAC, San Diego

FIGURE A-12
GROUNDWATER ELEVATION CONTOURS LOWER AQUIFER SYSTEM SPRING 1998

Revised FS IRP Site 1
DS.A007.10571

2004-02-05 R:\Navy\Point Mugu\cto-368\ FIG A-12.dwg TtEMI-SA deborah.ford

Originally, the groundwater levels in the upper aquifer system were higher than the levels in the unconfined aquifer, and there was artesian flow in the upper aquifer system wells (DWR 1965). Excessive pumping of upper-aquifer-system wells lowered the potentiometric surface such that the wells in the Oxnard aquifer no longer flowed freely. However, new facilities and management practices introduced in the 1980s and 1990s have restored artesian flow conditions in lower-aquifer-system wells.

Groundwater levels rise seasonally in lower-aquifer-system wells, and water levels approach sea level in many areas. Large annual fluctuations in water levels that result from seasonal pumping stresses confirm the relatively low permeability of the lower aquifer system (UWCD 1998).

Although water levels in the upper aquifer system have declined, they are still higher than the level of the "clay cap" confining layer, and there is an upward vertical gradient between the upper aquifer system and the unconfined aquifer (Fugro-McClelland 1991).

Seawater Intrusion and Major Ion Chemistry

Pumping of the upper and lower aquifer systems reversed the historic groundwater gradient, and groundwater flowed inland from the Pacific Ocean. This inland flow produced a significant level of seawater intrusion into the aquifers. Because of groundwater management strategies as well as increased groundwater recharge, water levels have recently been recovered in the upper aquifer system. However, they remain depressed in the lower aquifer system.

A study by the County of Ventura (1990) estimated that seawater intrusion into the Oxnard aquifer extends between 2 to 4 miles inland from the coast. More recently, Stamos and others (1992) estimated that the seawater intrusion is only about 1 to 2.5 miles inland from the coast. The earlier estimates are probably inaccurate because they were based on chloride concentrations in groundwater that are now attributed to sources other than seawater (Izbicki 1991).

Seawater has intruded into the groundwater in the unconfined aquifer at NBVC Point Mugu. Total dissolved solids (TDS) concentrations in the groundwater are high, and the major anion and cation chemistry is similar to that of seawater (Hem 1992). The groundwater exhibits a sodium-chloride type chemistry characteristic of seawater intrusion followed by cation exchange (calcium replacing sodium in solution). Ninety percent (38 of 42) of the wells in the unconfined aquifer contained TDS concentrations greater than 3,000 milligrams per liter (mg/L).

The average of four quarters of well data showed TDS concentrations in 42 wells in the unconfined aquifer to be 9,560 mg/L. Quarterly averages ranged from 6,960 mg/L to 12,000 mg/L.

Seasonal variations in rainfall and the rate of freshwater recharge to the unconfined aquifer account for the seasonal fluctuations in TDS levels. In addition, tidal fluctuations may temporarily alter TDS levels in wells that are subject to tidal influence.

Persistently high TDS concentrations in the unconfined aquifer and the underlying Oxnard aquifer are probably caused by an intruding seawater front in the unconfined and the Oxnard aquifers. Because of the widespread occurrence of high TDS concentrations, mass balance considerations rule out point source contamination as a major contributor to the TDS levels.

The average level of TDS at NBVC Point Mugu in the semi-perched aquifer is greater than 13,500 mg/L. The Navy is actively seeking a change for the semi-perched aquifer to nonbeneficial use. The semi-perched aquifer, although so designated, is not being used as a source of drinking drinking water. The RWQCB is currently evaluating the Navy's request t o remove the municipal and domestic supply designation from the semiperched aquifer at NAS Point Mugu.

A.2.4.3 Surface Water Hydrology

Mugu Lagoon is the most significant water body within NBVC Point Mugu. The current lagoon hydrology is a function of existing freshwater inputs to the lagoon, the influence of the tides on flushing of lagoon waters, and physical modifications to surface water flow that were made within the lagoon. The lagoon itself is divided into three areas, the western arm, the eastern arm, and the central basin. Each of these areas responds in a different manner to water circulation and sedimentation.

Mugu Lagoon is connected to the Pacific Ocean through an opening in the barrier beach. The maximum tidal range measured within the lagoon is about 6 feet. The tidal range in the central basin is greatest because the central basin is directly connected to the ocean. The western and eastern arms have smaller tidal ranges because of their limited inlets.

Mugu Lagoon is relatively shallow. Depths are generally less than 10 feet at high tide. Circulation patterns within the lagoon are characterized by low mixing and flushing rates in the western arm of the lagoon and moderate to fast mixing and flushing rates in the eastern arm and central basin.

The tidal prism (that is, the volume of water moved in an out of the lagoon) is large in comparison to the volume of water retained in the lagoon during low tide. As a result, the lagoon is a marine-dominated system. Salinity readings range from 1.0 to 29 percent in the central basin, from 24 to 33 percent in the western arm, and from 27 to 32 percent in the eastern arm.

Tidal action flushes water and sediment into and out of Mugu Lagoon. The degree of flushing varies considerably with the lunar tidal cycle and storm surges. Predominant southeast-flowing long- shore currents ensure that very little of the water and material leaving the lagoon during ebb tides re-enter the lagoon on the following flood tides (Onuf 1987). The relatively large exchange of water between the lagoon and the ocean that results from tidal action creates rapid currents at the narrow opening between the lagoon and ocean. Water velocities have been measured at about 8.8 feet per second (ft/sec) at the opening (Onuf 1987).

The inlet from the Pacific Ocean to the lagoon migrates seasonally from east to west, depending on the local wave environment and flow rates in Revolon Slough and Calleguas Creek. Historically, under low flow conditions, the inlet migrated eastward along the coast from a position directly opposite the mouth of Calleguas Creek. The migration was caused primarily by longshore transport of beach sands. The original position of the mouth reestablished itself because of periodic floods and runoff from Calleguas Creek (Warme 1971). The periodic migration of the mouth maintained flushing in the eastern arm of the lagoon and ensured the presence of sandy substratum. Presently, however, increased flows through Calleguas Creek have reduced the ability of longshore currents to cause mouth migration. Thus, ocean water flushing has been reduced, and fine sediments have accumulated in the eastern arm.

The central basin of the lagoon is greatly affected by the surface water and sediment input from Calleguas Creek, Revolon Slough, and ODD No. 2 (see Figure A-4). The central basin experiences larger inputs of sediment during winter months that alter the lagoon's bottom configuration and circulation patterns.

The western arm of that lagoon receives most of the surface runoff from NBVC Point Mugu. The primary surface water input to the western arm is ODD No. 3 (see Figure A-4). This ditch transports agricultural and storm runoff from off-base sources. Sedimentation is lower in the western arm of the lagoon because of the gradual slope and slow currents in the drainage ditches that empty into the western arm. The western arm's connection to the central basin, and ultimately to the ocean, is through two culverts under Laguna Road. These culverts restrict flow under Laguna Road. They limit the hydrologic flushing rate of the western arm and the exchange of sediment with the central basin (Steffen 1982).

The eastern arm of the lagoon receives limited freshwater input from the adjoining Laguna Peak and Point Mugu State Park to the north. Runoff from these areas flows through a series of culverts south of Highway 1. In addition, drainage from the firing range at the easternmost point in NBVC Point Mugu flows into the eastern end of this arm.

The eastern arm is connected to the central basin through tidal channels and flats that are constantly changing with the tides, storm flows, and inlet location. During floods, especially those associated with high tides, sediment-laden waters that cover the marshes on the eastern side of the lagoon are slowed by marsh vegetation. They deposit their sediments on the marsh surface and in the lagoon.

Perennial freshwater streams in the Oxnard Plain consist of Calleguas Creek and its tributaries, Revolon Slough, and Conejo Creek, located in the upper reaches of the watershed. These streams drain an area of about 325 square miles, including mountainous areas and level floodplains in the southern part of the Oxnard Plain (Steffen 1982). Flows in these streams ultimately discharge to Mugu Lagoon and serve as the primary source of freshwater input to the lagoon. The surface soils in the Oxnard Plain are primarily alluvial. They are easily erodible by surface water flows (Steffen 1982).

Freshwater inputs to Calleguas Creek come from three sources: National Pollutant Discharge Elimination System (NPDES)-permitted discharges; stormwater runoff; and agricultural irrigation return. Inputs from the 22 NPDES-permitted discharges total about 31 million gallons per day (mgd) of actual flow (39 mgd is permitted) or 48 cubic feet per second (cfs) (RWQCB 2004). Most of this water percolates into the sediments of the creek beds before reaching Mugu Lagoon (Birosik 1993).

Because of the arid conditions and changed land use patterns in the region, the flow in Calleguas Creek is highly responsive to rainfall. Agriculture is the primary land use in the watershed. However, urbanization has increased rapidly in the past 15 years, especially in the valley and hillslope areas (U.S. Army Corps of Engineers [COE] 1992). Urbanization has resulted in increased runoff due to reduced areas available for infiltration.

Flows in Calleguas Creek also vary depending on recent hydrologic conditions. Between 1969 and 2002, flows recorded at gauging stations about 6.7 miles upstream from Mugu Lagoon ranged from no flow to a maximum of 25,900 cfs. During this period, the average flow past these stations was 41.2 cfs (Bader 1993 and United States Geological Survey 2004). However, storms resulted in rapid increases in stream flow. Peak flows in Calleguas Creek were estimated for various storm intensities. In a two-year storm, maximal flow was estimated at 2,500 cfs. A 10-year flood results in a flow of 11,810 cfs into Mugu Lagoon (Simons, Li, and Associates 1989). The lowest recorded monthly dry weather average flow with a return period of 3 years in the lower Calleguas Creek reach has been reported as 12 cfs (Larry Walker Associates 2001).

Under normal conditions, most of the flow in the Calleguas Creek drainage area comes from agricultural irrigation return. Revolon Slough, which receives runoff from 38,200 acres of agricultural land (Steffen 1982), joins Calleguas Creek just within the NBVC boundary, about 1.5 miles from Mugu Lagoon. Normal flow conditions in Revolon Slough and Calleguas Creek near Mugu Lagoon have not been determined.

Local freshwater flows into Mugu Lagoon from ODD No. 2, which joins Calleguas Creek on the NBVC, and from ODD No. 3, which drains into the western arm of the lagoon (see Figure A-4). These ditches drain nearby agricultural land and parts of NBVC. Because they are subject to tidal influences, a series of tide gates are installed in both ditches to control flooding of the ditches and upstream farmland.

Low elevations and mild slopes characterize most of the NBVC. Thus, surface water flow velocities are very slow. The surface runoff of the NBVC drains into a network of ditches and culverts that ultimately drain into Mugu Lagoon or Calleguas Creek. Constrictions due to roads and other structures impede flow and tidal flushing. A small area parallel to the ocean shoreline in the southern part of the NBVC Point Mugu drains directly into the Pacific Ocean. Much of the area surrounding the lagoon and extending west from the lagoon's western limit is tidally inundated (SCS and Landau Associates 1985). Large duck ponds are located north of the western part of the NBVC.

The area of tidal influence at NBVC Point Mugu extends along Mugu Lagoon, the ocean and the surface water bodies and rivers that are in contact with or near the ocean (see Figure A-13).

Legend

- TIDAL STUDY MONITORING LOCATION
- MAXIMIUM EXTENT OF TIDAL INFLUENCE
- AREA NOT UNDER TIDAL INFLUENCE
- PAVED
- ROAD
- RUNWAY
- UNPAVED
- WATER

0 1,000 2,000 4,000 Feet

Tetra Tech EM Inc.

NBVC Point Mugu Site, California

U.S. Navy Southwest Division, NAVFAC, San Diego

Figure A-13

AREA OF TIDAL INFLUENCE IN SURFACE WATER AND SEMI-PERCHED AQUIFER

Revised FS IRP Site 1
DS.A007.10571

2004-01-28 o:\mugu\site1\mxd\figure_a-13.mxd TtEMI-DN kurt.cholak

A.2.5 SURROUNDING LAND USE AND POPULATIONS

The land surrounding NBVC Point Mugu is used for various agricultural, recreational, and industrial purposes, as shown in Figure A-14. The foothills of the Santa Monica Mountains border NBVC Point Mugu to the east. They are designated as open lands used for grazing, agricultural, and recreational purposes. Point Mugu State Park also is located to the east of the NBVC. Point Mugu State Park, Mugu Lagoon, and the privately owned foothills are all part of the Santa Monica Mountains National Recreation Area (Fugro-McClelland 1991).

Immediately north and northwest of NBVC Point Mugu are two duck clubs: the Point Mugu Game Reserve; and the Ventura County Game Reserve. These clubs provide up to 620 acres of freshwater pond habitat for migratory waterfowl, shorebirds, and nongame species. Further to the north and northwest is a wide expanse of agricultural land. As shown on Figure A-14, very little residential and industrial development is currently present in the immediate area of NBVC Point Mugu.

Ecological Characteristics

The ecosystem at NBVC Point Mugu consists primarily of the open estuarine waters of the lagoon and the coastal tidal marsh. As a result of the development of southern California, such estuaries and tidal marshes are rare.

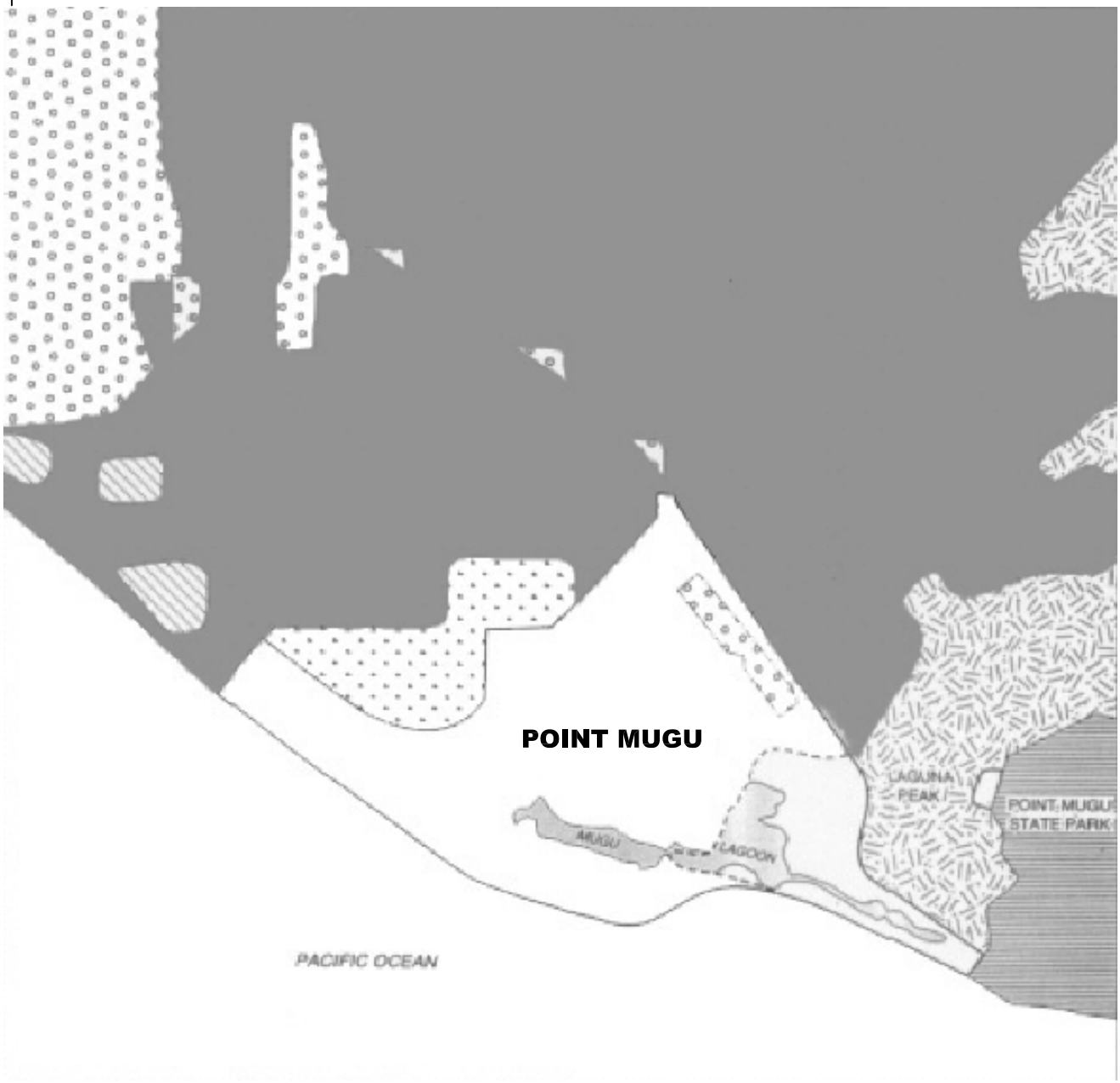
The following sections describe habitat types and typical species, special status species, linkage among habitats, and seasonal use of habitats at NBVC Point Mugu and the surrounding area.

A.2.5.1 Habitat Types and Typical Species

Habitat types at NBVC Point Mugu consist of tidal and nontidal or upland areas. The tidally influenced areas comprise about one-half of NBVC Point Mugu and penetrate the developed part of the NBVC. They include open water, tidal marsh, and intertidal mudflat habitat. Upland areas consist primarily of normative grassland maintained by NBVC personnel, grasslands, shrublands, coastal dunes, and fresh- to brackish- to saline-water marshes. In addition, adjacent to the NBVC are privately owned and managed duck ponds totaling more than 600 acres. The following paragraphs are a general discussion of the four dominant habitats at NBVC Point Mugu: open water; tidal marsh; intertidal mudflat; and uplands. Food webs for these habitats are illustrated in Figures A-15 through A-18.

Open Water

About one-fifth (300 acres) of the Mugu Lagoon system is permanently inundated open water habitat. Submerged habitat in the lagoon system includes subtidal sediments below mean low water (Onuf 1987).



3000' 0 3000' 6000'

SCALE: 1" = 6000'

SANTA MONICA MOUNTAIN RESERVE NATIONAL RECREATION AREA

RESIDENTIAL

INDUSTRIAL

PARK/RECREATIONAL

OVERLAND AREA OF NATIONAL RECREATION AREA, NOT FOR PUBLIC ACCESS

AGRICULTURAL

GAME RESERVE

NBVC POINT MUGU

Source: Tetra Tech 2001

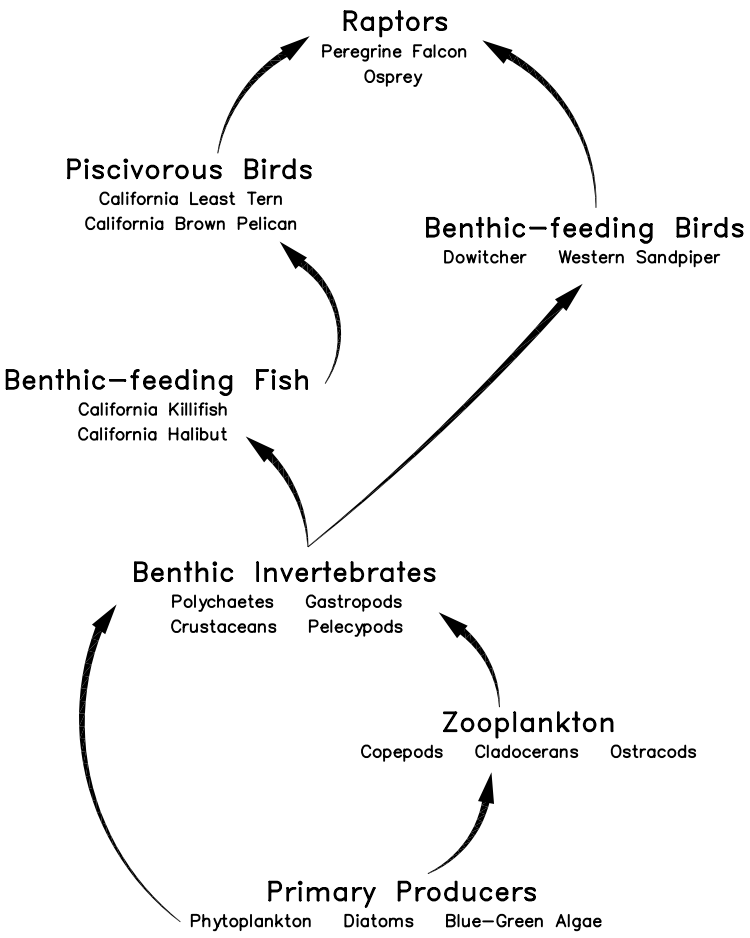
Tetra Tech EM Inc.

NBVC POINT MUGU, CALIFORNIA
U.S. Navy Southwest Division, NAVFAC, San Diego

FIGURE A-14
LAND USE SURROUNDING POINT MUGU

Revised FS IRP Site 1
DS.A007.10571

2004-02-05 R:\Navy\Point Mugu\cto-368\ FIG A-14.dwg TtEMI-SA deborah.ford



Note: Species under each guild heading vary in actual diet composition and by IRP site.

Source: Tetra Tech 2001

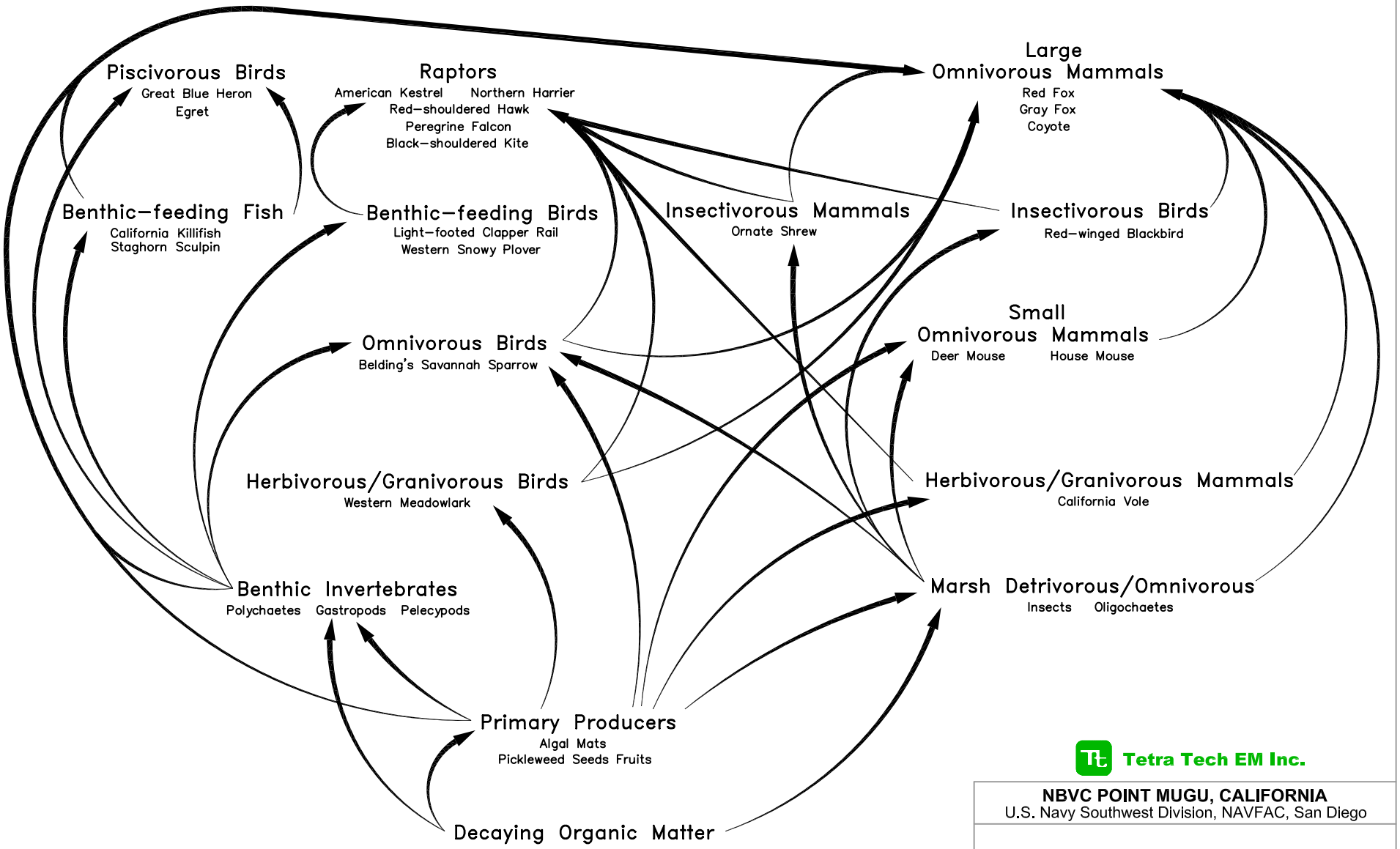
Tetra Tech EM Inc.

NBVC POINT MUGU, CALIFORNIA
U.S. Navy Southwest Division, NAVFAC, San Diego

FIGURE A-15
OPEN-WATER FOOD WEB

Revised FS IRP Site 1
DS.A007.10571

2004–02–05 R:\Navy\Point Mugu\cto–368\ FIG A–15.dwg TtEMI–SA deborah.ford



NOTE:
Species under each guild heading vary in actual diet composition and by IRP site.

Source: Tetra Tech 2000

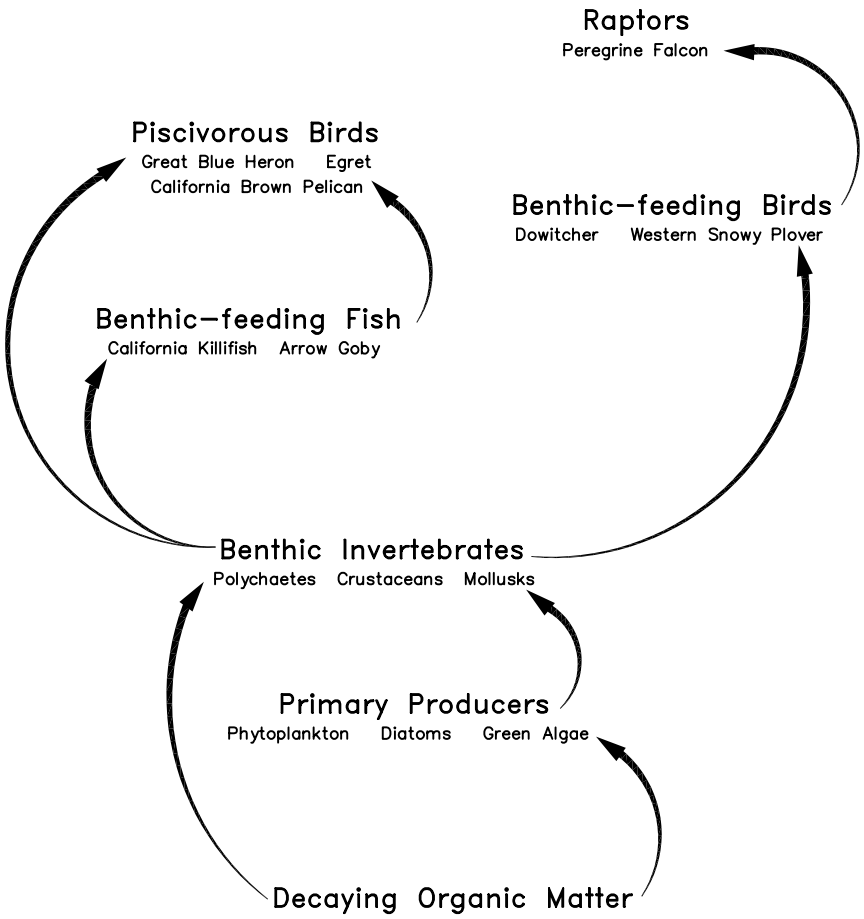
Tetra Tech EM Inc.

NBVC POINT MUGU, CALIFORNIA
U.S. Navy Southwest Division, NAVFAC, San Diego

FIGURE A-16
TIDAL MARSH FOOD WEB

Revised FS IRP Site 1
DS.A007.10571

2004-02-05 R:\Navy\Point Mugu\cto-368\ FIG A-16.dwg TtEMI-SA deborah.ford



Tetra Tech EM Inc.

NBVC POINT MUGU, CALIFORNIA
U.S. Navy Southwest Division, NAVFAC, San Diego

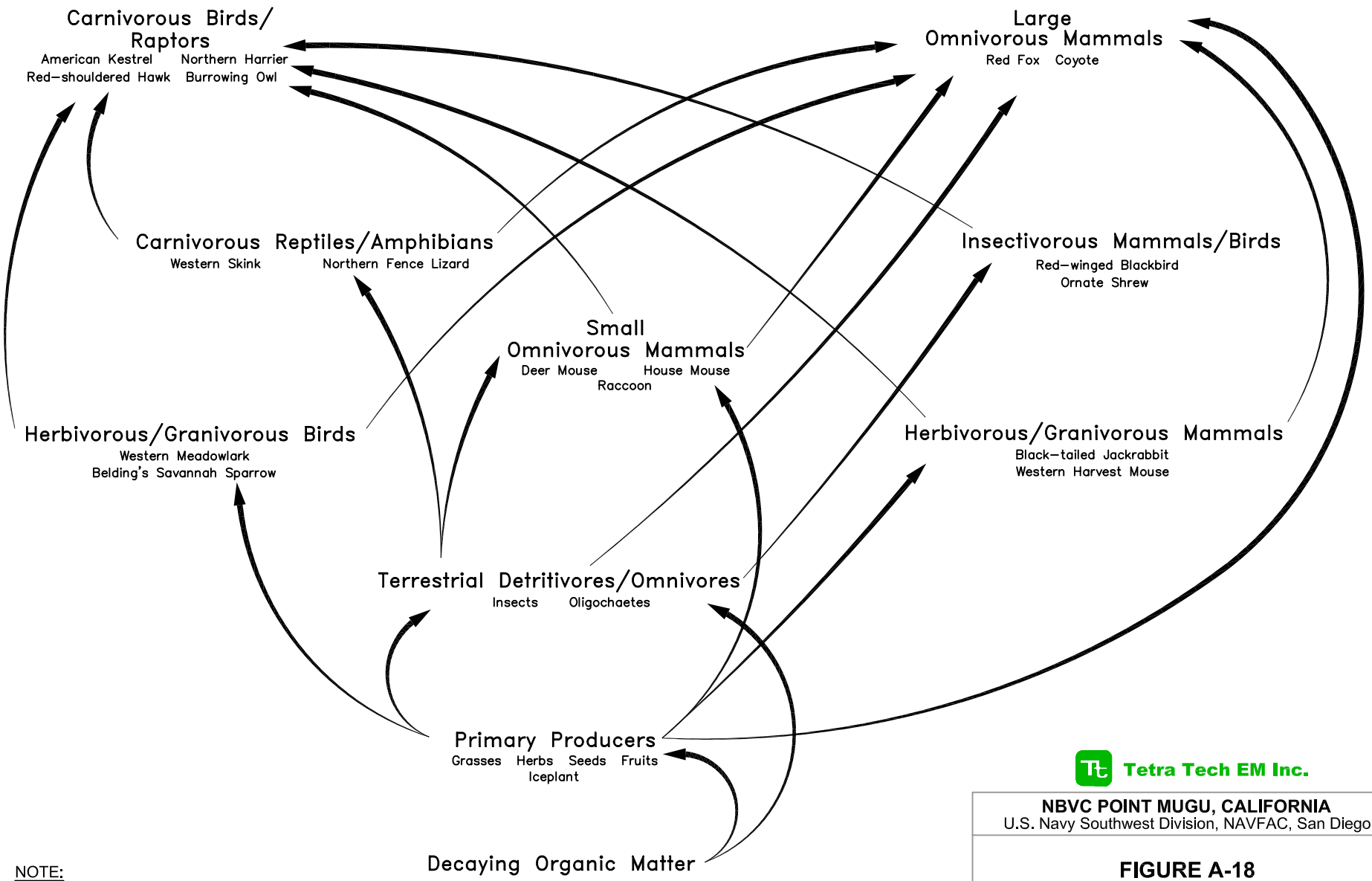
FIGURE A-17
INTERTIDAL MUDFLAT FOOD WEB

Revised FS IRP Site 1
DS.A007.10571

Note: Species under each guild heading vary in actual diet composition and by IRP site.

Source: Tetra Tech 2001

2004–02–05 R:\Navy\Point Mugu\cto–368\ FIG A–17.dwg TtEMI–SA deborah.ford



NOTE:
Species under each guild heading vary in actual diet composition and by IRP site.

Source: Tetra Tech 2000

Tetra Tech EM Inc.

NBVC POINT MUGU, CALIFORNIA
U.S. Navy Southwest Division, NAVFAC, San Diego

FIGURE A-18
UPLAND FOOD WEB

Revised FS IRP Site 1
DS.A007.10571

2004-02-05 R:\Navy\Point Mugu\cto-368\ FIG A-18.dwg TtEMI-SA deborah.ford

The open waters of Mugu Lagoon are strongly influenced by the lagoon's connection with the Pacific Ocean. Daily tidal action introduces a substantial volume of ocean water carrying suspended organisms and fish into the lagoon. Drainage ditches and creeks on the NBVC bring fresh water into the lagoon, thereby affecting the salinity, turbidity, and nutrient levels of the water column. The lagoon is a spawning and feeding area for several species of fish, including topsmelt (*Atherinops affinis*) and staghom sculpin (*Leptocottus armatus*) (Onuf 1987).

The open water habitat within the lagoon is underlain by sediments of varying composition. The sediments of the central basin and lower portion of the eastern basin of the lagoon are composed mostly of sand. Fine silts and clays are deposited in the arms of the lagoon. The benthic community is generally characterized by organisms adapted to soft sediments, benthic invertebrates that burrow into sediment surfaces, and a paucity or absence of vascular plants.

Free-floating phytoplankton comprise most of the primary production, or plant growth, in the open water habitat. However, because the waters immediately offshore are generally turbid and nutrient-poor, ocean phytoplankton introduced by tidal action contribute little to the overall primary production of the lagoon (Onuf 1987). Instead, the water column is dominated by benthic diatoms, dinoflagellates, and filamentous blue-green algae (Zedier 1982). Figure A-15 illustrates the open water food web in Mugu Lagoon.

Zooplankton is the most significant primary consumers of phytoplankton in Mugu Lagoon. Several zooplankton species found in the lagoon are copepods, cladocerans, ostracods, and arrow worms (MacDonald 1976). Topsmelt use the lagoon for spawning, so both adults and young frequently are found in the lagoon. Topsmelt feed primarily on diatoms and algae. However, they also consume small crustaceans, insects, and some benthic invertebrates (Onuf 1987). Another major group of primary consumers is the filter feeders, including clams and snails, which feed mainly on planktonic organisms.

The secondary consumers consist primarily of avian predators, such as the California brown pelican (*Pelacanus occidentalis californicus*) and the California least tem (*Stenta atztillarum brownie*). These bird species prey on fish, such as topsmelt. Other secondary consumers include fish, such as California killifish (*Fundulus parvipinnis*), which feed on small crustaceans and gastropod mollusks, and California halibut (*Paratichthys californicus*), which feed on small fish and crustaceans (Onuf 1987).

Tidal Marsh

Intermittently flooded tidal marsh is widespread throughout NBVC Point Mugu, and it totals about 1,011 acres. Tidal marsh is found between mean high water and extreme high water. It is characterized by vascular plants, such as cordgrass (*Spartinafoliosa*). The eastern arm of Mugu Lagoon contains tidal marsh directly north of the ocean inlet and north and east of the central basin. The western arm of the lagoon has tidal marsh on both its northern and southern edges.

Pickleweed (*Salicornia spp.*), a low-growing succulent halophyte, is found in the frequently inundated, low elevations of the marsh. It also occurs in the high marsh with other vascular plants, such as grasses, rushes, and herbaceous plants. The plant species composition of the less frequently inundated, higher elevations reflects significant changes in salinity and shorter periods of inundation. The soils are sandy and relatively inorganic, and the dominant plant species are low-growing halophytes. The transition zone, where developed areas and roads border the marsh, is dominated by low-growing shrub species.

Salt panne habitat is found at the extreme upper edges of the tidal marsh and is inundated by only the highest tides and storm events. Water deposited in salt panne habitat is removed by evaporation, leaving barren, scalded areas. Only plants and animals tolerant of hypersaline environments can exist in this habitat. Salt panne habitat exists east of the sewage treatment ponds at NBVC Point Mugu.

Figure A-16 illustrates the tidal marsh food web at NBVC Point Mugu. Algae are important primary producers of the tidal marsh. Algal mats in the tidal marsh consist of green algae, blue-green algae, and numerous diatom species. Algal mats tend to occur in areas with sparse vascular plant cover.

Primary consumers of the tidal marsh are benthic epifaunal invertebrates, such as the California homsnail (*Cerithidea califoritica*), which is abundant in the upper reaches of the tidal channels entering the marsh. California homsnails are found primarily in tidal pools. They forage on benthic diatoms and detritus. Another dominant species and primary consumer in the tidal marsh is the California rnelampus snail (*Metampus olivasceous*), which feeds on marsh algal mats (Zedler 1982). Striped shore crabs (*Pachygrapsus class*) and yellow shore crabs (*Hemigrapsus oregonensis*) are other common benthic epifaunal species that feed on algae and diatoms.

There is little direct consumption of the vascular plants of the tidal marsh at Mugu Lagoon. Belding's savannah sparrow (*Passerculus sandwichensis beldingi*) may feed on the succulent tips of pickleweed, but only when insects are rare. Small mammals, such as the California vole (*Microtus californicus*), may also forage on marsh vegetation.

Secondary consumers of the tidal marsh are fish and birds. Fish species that are common in Mugu Lagoon (including topsmelt, California killifish, staghom sculpin, arrow gobies, and longjaw mud- suckers [*Gillichthys mirabilis*]) often move into tidal marsh areas. The topsmelt and California killifish move with the tide in order to feed. The staghom sculpin and longjaw mudsuckers often remain in the tidal marsh and retreat into burrows and depressions when the tide retreats.

Herons, egrets, and other marsh birds are abundant along tidal creeks in the marsh. The snowy egret (*Egretta thula*) and the great egret (*Casmerodius albus*) are seasonal visitors from September through April. The great blue heron (*Ardea herodias*) is a permanent resident of the Mugu Lagoon area. These herons and egrets forage for fish, small crustaceans, and other invertebrates in the marsh and in other habitats at NBVC Point Mugu.

The federally listed light-footed clapper rail (*Rallus lotigirostris levipes*) nests in stands of cordgrass in the tidal marsh of Mugu Lagoon (Onuf 1987). The marsh is also an important foraging area for the rail, which eats snails, crabs, and fish. Other marsh birds that inhabit NBVC Point Mugu include willets (*Catoptrophorus semipalmatus*), godwits (*Liinosafedoa*), long- and short-billed dowitchers (*Limizodromus scolapaceas* and *L. griseus*, respectively), stilts, and avocets (*Recurvirostra americans*).

Intertidal Mudflats

Intertidal mudflats, which occur between mean lower low water and mean high water, cover about 123 acres of Mugu Lagoon. Tidal flats of bare mud adjacent to subtidal channels occur in the central basin and the eastern and western arms of the lagoon. Tidal flushing and sediment deposition in the lagoon have resulted in sandy tidal flats in the eastern arm and silty-clay surface sediments in the western arm. In recent years, mudflats of the central basin have increased because of sedimentation of the basin.

Figure A-17 illustrates the intertidal mudflat food web at NBVC Point Mugu. Green algae, benthic diatoms, and blue-green algae dominate the mud surface. Infaunal bivalve mollusks and crabs are common primary consumers on the mudflat. The California homsnail is a dominant epifaunal grazer of the higher mudflat. It feeds primarily on fine organic detritus and on algae on the mud surface.

Secondary consumers are fish and shorebirds. The fish move into the mudflat habitat on incoming tides. Species that are common to the mudflats include topsmelt, arrow gobies, shiner serfperch, and California killifish.

Numerous species of surface-feeding and probing shorebirds forage over the mudflats for sediment-dwelling invertebrates. Most shorebirds are seasonal visitors, typically during the winter months. Common shorebird species at Mugu Lagoon include willets, long- and short-billed dowitchers, and western sandpipers (*Calidris mauri*). Prey items include marine worms, small crustaceans, and mollusks. The state and federally listed endangered American peregrine falcon (*Falco peregritius anatum*) is also a seasonal visitor to NBVC Point Mugu. It may be found on the mudflats as well as in other habitats. It preys on small birds and waterfowl.

Uplands

The most prevalent upland habitat at NBVC Point Mugu is normative grassland composed primarily of ruderal vegetation. This grassland habitat occurs to the north and west of the central basin in the vicinity of NBVC infrastructure such as runways, roads, buildings, and paved areas. Other upland areas include coastal dune habitat.

Figure A-18 illustrates the upland food web at NBVC Point Mugu. The uplands support cultivated grasses, ornamental plants, and remnant native vegetation. Many passerine birds, small mammals, and raptors use these grasslands. Small mammals include various species of

mice, ground squirrels, raccoons, and rabbits. These animals are subject to predation by foxes, coyotes, and raptors.

Species of raptors recorded on NBVC Point Mugu include the American kestrel, American peregrine falcon, red-tailed hawk, red-shouldered hawk, northern harrier, osprey, black-shouldered kite, and burrowing owl (PRC 1993). All raptor species are nonbreeding migrants or winter visitors. They feed on mammals, insects, and smaller birds.

Other uplands at NBVC Point Mugu include a 290-acre coastal dune habitat that forms the barrier between the sand beach to the south and salt marshes to the north along the eastern and western arms of the lagoon.

A.2.5.2 Special Status Species

NBVC Point Mugu supports a variety of threatened, endangered, or other special status categories of plant and animal species. A complete list of special status species expected at NBVC Point Mugu is presented in Table A-1.

Populations of the salt marsh bird's beak (*Cordylanthus maritirnus*), which is listed as endangered by both the State of California and the U.S. Government, occur in the high marsh on the southwestern part of the NBVC (Onuf 1987). This plant is hemiparasitic. It is capable of completing its life cycle without host plants, or it can be parasitic on the roots of other plants. It has a high tolerance for saline conditions.

Belding's savannah sparrow is listed as endangered by the State of California. It is a local, year-round resident at NBVC Point Mugu (Onuf 1987). The sparrow forages on a variety of insects, seeds, and small invertebrates. It has been observed feeding in upland, dune, beach, and exposed mudflat habitats (Onuf 1987; Massey 1979).

The state- and federally listed light-footed clapper rail breeds on the marshes surrounding Mugu Lagoon (Onuf 1987). Primary nesting habitat occurs in the lower salt marsh. The California least tem (*Sterna atitillaurm browni*), another state- and federally listed endangered species, has also been reported at NBVC Point Mugu.

The American peregrine falcon currently is listed as endangered by both the U.S. Fish and Wildlife Service (USFWS) and the State of California. Peregrines are seasonal visitors at NBVC Point Mugu and are found in all habitat types that provide foraging habitat for its prey. Peregrines feed mostly on small birds, shorebirds, and waterfowl.

The western snowy plover (*Charadrius alexandriizus nivosus*) is a California species of special concern. It was federally listed as threatened in 1993 (PRC 1993). The plover forages for insects and other small invertebrates in lagoon mudflats.

TABLE A-1. SPECIAL STATUS SPECIES AT NBVC POINT MUGU

Common Name	*Scientific Name*	Status[(a)]	Comment
Salt marsh bird's-beak	*Cordylanthus maritimus ssp. maritimus*	FE, SE	Tidal marsh on southwest portion of base
California brackish water snail	*Tryonia imitator*	FC2	Mudflat, open water habitats
Globose dune beetle	*Coelus globosus gravida*	FC2	
Sandy beach tiger beetle	*Cicindela hirticollis gravida*	FC2	
Saltmarsh skipper	*Panoquina errans*	FC2	
Tidewater goby	*Eucyclobius newberryi*	FE, CSC	Tidal marsh, open water habitats
Southwestern pond turtle	*Clemmys marmorata pallida*	FC2, CSC	
California brown pelican	*Pelecanus occidentalis californicus*	FE, SE	Observed feeding in lagoon (Site 11) during surveys
Western least bittern	*Ixobrychus exilis hesperis*	FC2, CSC	Marsh habitats
Harlequin duck	*Histrionicus histrionicus*	FC2, CSC	Inhabits coastal waters in winter
Light-footed clapper rail	*Rallus longiroastris levipes*	FE, SE	Observed at Site 5 in marsh and tidal creek
Western snowy plover	*Charadrius alexandrinus nivosus*	FT, CSC	Mudflat habitat
California least tern	*Sterna antillarum browni*	FE, SE	Open water, tidal creeks
Elegant tern	*Sterna elegons*	FC2, CSC	Open water habitat
American peregrine falcon	*Falco peregrinus anatum*	FE, SE	Multiple habitats, winter resident
Ferruginous hawk	*Buteo regalis*	FC2, CSC	Southwestern U.S. coastal areas in winter
Northern harrier	*Circus cyaneus*	CSC	Upland, marsh habitat
Burrowing owl	*Athene cunicularia*	CSC	Upland habitat
Loggerhead shrike	*Lanium ludovicianus*	FC2, CSC	Upland habitat
Large-billed savannah sparrow	*Passerculus sandwichensis rostratus*	FC2, CSC	Upland, marsh habitat
Belding's savannah sparrow	*Passerculus sandwichensis beldingi*	FC2, SE	Upland marsh, forages on Salicornia and Atriplex ssp.
Tricolored blackbird	*Agelaius tricolor*	FC2, CSC	Upland, marsh habitat
Dusky-footed woodrat	*Neotoma fuscipes*	CSC	Upland habitat; observed at Sites 1, 4, and 5 during ecological surveys
Harbor seal	*Phoca vitulina*	MMPA	Observed at Site 11 in lagoon and at lagoon mouth

Notes:

(a) Status as listed in California Department of Fish and Game (1992 and 1993).

Status Key:
- FE Federally listed as endangered
- FT Federally listed as threatened
- FC1 Category 1 federal candidate for listing
- FC2 Category 2 federal candidate for listing
- SE California listed as endangered
- CSC California "Species of Special Concern"
- MMPA Protected under the Marine Mammal Protection Act

Source: Tetra Tech (2001)

The harbor seal (*Phoca vitulina*), a species protected under the Marine Mammal Protection Act, is a year-round visitor at NBVC Point Mugu. It hauls out on beaches and sandbars near the mouth of the lagoon (Onuf 1987).

A.2.5.3 Linkage among Habitats

The movement of predators and prey between habitats is considered in evaluating ecological exposure. Omnivorous birds, such as Belding's savannah sparrow, and omnivorous mammals, such as deer mice, house mice, and red fox, may feed in both upland and marsh habitats. Insectivorous birds and mammals move between habitats based on seasonal and tidal cycles.

Predators forage in both marsh and upland habitats. Peregrine falcons consume shorebirds, waterfowl, and passerines (Bell and others 1994). Black-shouldered kites feed on insects and rodents in marsh areas. Northern harriers may feed on western harvest mice in the marsh, and prey on upland rodents, birds, and lizards.

A.2.5.4 Seasonal Use of Habitats

Some ecological receptors are more prevalent at NBVC Point Mugu during certain times of the year. For example, seasonality in habitat use is displayed by fishes during the summer and by surface feeding and probing shorebirds foraging on intertidal mudflats and shallow open waters during winter months (Onuf 1987). Shorebirds respond to prey availability over their migratory range, while fish may respond to temperature differences between the lagoon and near shore waters. Increased watershed discharges, which reduce estuarine salinity during the winter season, may also influence prey or predator abundance. Less frequent tidal inundation of the high marsh may affect the seasonality of plant growth and associated animal habitat use. Precipitation and high tides during storm periods are generally greater during the winter months. This precipitation may initiate earlier and more pronounced plant growth (Onuf 1987). Plant and animal species that prefer lower salinities may also increase use from spring through early summer, prior to late summer, and during fall periods of drier soils and higher salinity. For example, the salt pannes are used by waterfowl in winter and by small mammals and insects in the summer and fall (Zedler and Norby 1986).

A.2.6 CULTURAL RESOURCES

Only one Chumash Indian archaeological site is known to occur within the boundaries of NBVC Point Mugu. It currently is being assessed for the National Register of Historic Places. In addition, about 12 historic sites have been identified at the NBVC. They include the historic Mugu Fish Camp, several historic ranches, and several shipwrecks.

A.3 REFERENCES

Bader, J. 1993. Personal communication by J. Bader of the U.S. Geological Survey, Water Resources Division, Sacramento, CA, to Craig Miller, Tetra Tech EM, Inc. March 12.

Bell, D.A., D.P. Gregoire, and B.J. Walton. 1994. "Bridge Use by Peregrine Falcons in the San Francisco Bay Area." Proceedings of the Symposium on Raptors Adapting to Human-Altered Environments.

Birosik, S. 1993. Personal communication by S. Birosik, California Regional Water Quality Control Board, Los Angeles Region, to Donna Courington, JMM. March 1.

California Department of Water Resources. 1965. "Sea-Water Intrusion." Oxnard Plain of Ventura County, Bulletin No. 63- 1. October.

County of Ventura. 1990. "Oxnard Plain of Ventura County 1989 Seawater Intrusion Study." County of Ventura Public Works Agency.

Fisk, C., and B. Cohenour. 1993. "Tidal and Lunar Data for Point Mugu, San Nicolas Island, and the Barking Sands Area During 1994." Naval Air Warfare Center Weapons Division, Geophysics Division, Range Operations.

Fugro-McCielland. 1991. "Final Draft Site Inspection Report for Naval Air Station Point Mugu, California." October.

Hem, J.D. 1992. *Study and Interpretation of the Chemical Characteristics of Natural Water*. U.S. Geological Survey Water-Supply Paper No. 2254.

lzbicki, J.A. 1991. "Chloride Sources in a California Coastal Aquifer." pp.71-77. *In Proceedings of the Conference on Groundwater in the Pacific Rim Countries*, IR Div/ASCE, Honolulu, Hawaii, July 23-25, 1991.

Larry Walker Associates. 2001. "Calleguas Creek Nutrient TMDLs Public Review Draft." February.

MacDonald, K.B. 1976. "The Natural Resources of Mugu Lagoon, California." California Department of Fish and Game. Coastal Wetland Series No. 17.

Massey, B.W. 1979. "Belding's Savannah Sparrow." Southern California Ocean Studies Consortium. California State University Contract No. DACW09-78-C-008. U.S. Army Corps of Engineers, Los Angeles District.

McClelland Consultants (West), Inc. 1990. "Draft Site Inspection Work Plan, NAS Point Mugu." November.

Mukae, M.M. and J.M. Turner. 1975. "Ventura County Water Resources Management Study, Geologic Formations, Structures and History in the Santa Clara-Calleguas Area." Ventura County, Department of Public Works, Flood Control District.

Onuf, C.P. 1987. "The Ecology of Mugu Lagoon, California: An Estuarine Profile." U.S. Fish and Wildlife Service, Biological Report 85 (7.15). 122 pages. June.

Page, R.W. 1963. "Geology and Groundwater Appraisal of the Naval Air Missile Test Center Area, Point Mugu, California." U.S. Geological Survey Water Supply Paper 1619-S. U.S. Government Printing Office, Washington, DC.

PRC Environmental Management, Inc. 1993. "Naval Air Weapons Station, Point Mugu, California, Final Ecological Assessment Work Plan." December.

PRC Environmental Management, Inc. and James M. Montgomery, Consulting Engineers, Inc. 1992. "Underground Storage Tank Site Assessment, Site Investigation, Point Mugu, NAWS." December.

Regional Water Quality Control Board (RWQCB), Los Angeles Region. 1994. *Draft Update, Water Quality Control Plan, Los Angeles Region 4, Santa Clara River and Los Angeles River Basins*. April.

RWQCB. 2004. Calleguas Creek Watershed Permits. On-line address: http://www.swrcb.ca.gov/~rwqcb4/html/programs/regional_program/ws_calleguas.html

Simons, Li, and Associates, Inc. 1989. "Development of Interim Sedimentation Control Measures for Calleguas Creek." Prepared for County of Ventura, Public Works Agency, Flood Control Department.

Stamos, C.L., S.K. Predmore, and A.R. Zohdy. 1992. "Use of D-C Resistivity to Map Saline Groundwater." *In Proceedings of the 1992 Water Forum, Irrigation and Drainage Session*. Baltimore, MD. August 2-6.

Steams, Conrad, and Schmidt and Landau Associates. 1985. "Initial Assessment Study of Pacific Missile Test Center, Point Mugu, California." September.

Steffen, L.J. 1982. "Mugu Lagoon and Its Tributaries: Geology and Sedimentation." U.S. Department of Agriculture Soil Conservation Service. April.

Tetra Tech EM Inc. (Tetra Tech). 1998. Final Draft *Phase I Remedial Investigation, Technical Memorandum, Naval Air Weapons Station, Point Mugu, California*. Volumes 1-111. Prepared for Department of the Navy, Naval Facilities Engineering Command, Engineering Field Activity West, San Bruno, CA. June.

Tetra Tech EM, Inc. 2001. "Remedial Investigation/Feasibility Study Addendum for IRP Sites 1 and 6, Naval Base Ventura County, Point Mugu Site, California. Final." Prepared for Department of the Navy, Southwest Division, San Diego, California. January.

Tetra Tech. 2004. "Remedial Investigation for Groundwater. Naval Base Ventura County, Point Mugu Site, California." Prepared for Department of the Navy, Naval Facilities Engineering Command, Southwest Division, San Diego, California. January.

Turner, J.M. 1975. "Ventura County Water Resources Management Study, Aquifer Delineation in the Oxnard-Calleguas Area, Ventura County." Ventura County Department of Public Works, Flood Control District.

United States Geological Survey. 2004. Streamflow Statistics for California. On-line address: http://nwis.waterdata.usgs.gov/ca/nwis

United Water Conservation District. 1996. *Water Quality of the Santa Clara River and the Montalvo and Oxnard Plain Groundwater Basins*. October.

United Water Conservation District. 1998. "Monitoring of Seawater Intrusion, Oxnard Plain 1997 Annual Report." June.

U.S. Army Corps of Engineers. 1992. "Calleguas Creek, California, Reconnaissance Report." Draft. Prepared for Public Works Agency, County of Ventura, CA. June.

U.S. Department of Agriculture Soil Conservation Service and Forest Service. 1994. "Calleguas Creek Watershed Erosion and Sediment Control Plan for Mugu Lagoon." U.S. Department of Agriculture Soil Conservation Service and Forest Service Water Resources Planning Staff, Davis, CA. October.

U.S. Department of the Navy. 1993. Personal communication about unpublished data with Tom Keeney, Environmental Division, Naval Air Weapons Station, Point Mugu, California; T.E. Donn, Tetra Tech EM, Inc.; and Micki Miller, Wetlands Research Associates. January 13 and 14.

Warme, J.E. 1971. "Paleoecological Aspects of a Modem Coastal Lagoon." *University of California Publications in Geological Sciences*, 87: 1-1 10.

Zedler, J.B. 1982. "The Ecology of Southern California Coast Marshes: A Community Profile." U.S. Fish and Wildlife Service, Biological Services Program Report. FWS/OBS-81-54.

Zedler, I.B., and C.S. Norby. 1986. "The Ecology of Southern California of Tijuana Estuary, California: An Estuarine Profile." *U.S. Fish and Wildlife Service Biological Report*, 85(7.5).

APPENDIX B
REMEDIAL INVESTIGATION DATA TABLES

TABLE B-1

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SOIL, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB	SB	SB	SB	SB	SB
Point Name:	B1-1	B1-1	B1-2	B1-2	B1-3	B1-3	B1-3
Sample ID:	273-S01-049	273-S01-050	273-S01-052	273-S01-053	273-S01-055	273-S01-056	273-S01-057
Sample Date:	08-JAN-94	08-JAN-94	11-JAN-94	11-JAN-94	18-JAN-94	18-JAN-94	18-JAN-94
Screen Depth (feet bgs):	0.0 to 1.0	2.5 to 3.5	0.5 to 1.5	3.5 to 4.5	0.0 to 1.0	3.0 to 4.0	6.0 to 6.5
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	UPLAND	UPLAND	UPLAND
DIOXIN (ug/kg)							
HEPTACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	3 U	2 U	2 U
HEPTACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	3 U	2 U	2 U
HEXACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	3 U	2 U	2 U
HEXACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	3 U	2 U	2 U
OCTACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	5 U	5 U	**5**
OCTACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	5 U	5 U	5 U
PENTACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	3 U	2 U	2 U
PENTACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	3 U	2 U	2 U
TETRACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	1 U	1 U	1 U
TETRACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	1 U	1 U	1 U
PEST (ug/kg)							
4,4'-DDD	4 U	5 U	3 U	4 U	**21**	**58**	N/A
4,4'-DDE	4 U	5 U	3 U	4 U	**12** J	**28**	N/A
4,4'-DDT	4 U	5 U	3 U	4 U	**15** J	4 U	N/A
ALDRIN	2 U	3 U	2 U	2 U	4 U	4 U	N/A
ALPHA-BHC	2 U	3 U	2 U	2 U	4 U	4 U	N/A
ALPHA-CHLORDANE	2 U	3 U	2 U	2 U	**7**	**4** J	N/A
AROCLOR-1016	35 U	48 U	34 U	41 U	35 U	37 U	N/A
AROCLOR-1221	71 U	97 U	69 U	83 U	72 U	74 U	N/A
AROCLOR-1232	35 U	48 U	34 U	41 U	35 U	37 U	N/A
AROCLOR-1242	35 U	48 U	34 U	41 U	**39** J	37 U	N/A
AROCLOR-1248	35 U	48 U	34 U	41 U	35 U	37 U	N/A
AROCLOR-1254	35 U	48 U	34 U	41 U	**120** J	**140**	N/A
AROCLOR-1260	35 U	48 U	34 U	41 U	**120** J	**52** J	N/A
BETA-BHC	2 U	3 U	2 U	2 U	4 U	4 U	N/A
DELTA-BHC	2 U	3 U	2 U	2 U	4 U	4 U	N/A
DIELDRIN	4 U	5 U	3 U	4 U	**6** J	4 U	N/A
ENDOSULFAN I	2 U	3 U	2 U	2 U	4 U	4 U	N/A
ENDOSULFAN II	4 U	5 U	3 U	4 U	4 U	4 U	N/A
ENDOSULFAN SULFATE	4 U	5 U	3 U	4 U	4 U	4 U	N/A
ENDRIN	4 U	5 U	3 U	4 U	4 U	4 U	N/A
ENDRIN ALDEHYDE	4 U	5 U	3 U	4 U	4 U	4 U	N/A
ENDRIN KETONE	4 U	5 U	3 U	4 U	4 U	4 U	N/A
GAMMA-BHC (LINDANE)	2 U	3 U	2 U	2 U	4 U	4 U	N/A
GAMMA-CHLORDANE	2 U	3 U	2 U	2 U	**4** J	**4** J	N/A
HEPTACHLOR	2 U	3 U	2 U	2 U	4 U	4 U	N/A
HEPTACHLOR EPOXIDE	2 U	3 U	2 U	2 U	4 U	4 U	N/A

TABLE B-1 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SOIL, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB	SB	SB	SB	SB	SB
Point Name:	B1-4	B1-4	B1-4	B1-5	B1-5	B1-5	B1-6
Sample ID:	273-S01-058	273-S01-059	273-S01-060	273-S01-061	273-S01-062	273-S01-063	273-S01-064
Sample Date:	18-JAN-94	19-JAN-94	19-JAN-94	11-JAN-94	11-JAN-94	11-JAN-94	11-JAN-94
Screen Depth (feet bgs):	0.0 to 1.5	3.0 to 4.0	5.0 to 5.5	0.5 to 1.5	3.5 to 4.5	4.5 to 6.0	0.5 to 1.5
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
DIOXIN (ug/kg)							
HEPTACHLORINATED DIBENZO-P-DIOXIN	3 U	3 U	2 U	2 U	3 U	N/A	2.5 U
HEPTACHLORINATED DIBENZOFURAN	3 U	3 U	2 U	2 U	3 U	N/A	2.5 U
HEXACHLORINATED DIBENZO-P-DIOXIN	3 U	3 U	2 U	2 U	3 U	N/A	2.5 U
HEXACHLORINATED DIBENZOFURAN	3 U	3 U	2 U	2 U	3 U	N/A	2.5 U
OCTACHLORINATED DIBENZO-P-DIOXIN	5 U	**5**	5 U	5 U	5 U	N/A	5 U
OCTACHLORINATED DIBENZOFURAN	5 U	5 U	5 U	5 U	5 U	N/A	5 U
PENTACHLORINATED DIBENZO-P-DIOXIN	3 U	3 U	2 U	2 U	3 U	N/A	2.5 U
PENTACHLORINATED DIBENZOFURAN	3 U	3 U	2 U	2 U	3 U	N/A	2.5 U
TETRACHLORINATED DIBENZO-P-DIOXIN	1 U	1 U	1 U	1 U	1 U	N/A	0.99 U
TETRACHLORINATED DIBENZOFURAN	1 U	1 U	1 U	1 U	1 U	N/A	0.99 U
PEST (ug/kg)							
4,4'-DDD	**23** J	**35** J	**14** J	3 U	4 UJ	4 U	4 U
4,4'-DDE	**19**	**27**	**11** J	**40**	4 UJ	4 U	**12** J
4,4'-DDT	4 U	4 U	5 U	**61**	4 UJ	4 U	**11** J
ALDRIN	4 U	2 U	2 U	9 U	2 UJ	2 U	2 U
ALPHA-BHC	4 U	2 U	2 U	9 U	2 UJ	2 U	2 U
ALPHA-CHLORDANE	**7** J	**11**	2 U	2 U	2 UJ	2 U	2 U
AROCLOR-1016	38 U	43 U	45 U	34 U	39 UJ	43 U	37 U
AROCLOR-1221	77 U	86 U	92 U	69 U	79 UJ	88 U	76 U
AROCLOR-1232	38 U	43 U	45 U	34 U	39 UJ	43 U	37 U
AROCLOR-1242	**100** J	**150**	**290**	34 U	39 UJ	43 U	37 U
AROCLOR-1248	38 U	43 U	45 U	34 U	39 UJ	43 U	37 U
AROCLOR-1254	**72** J	**160** J	**65**	34 U	39 UJ	43 U	**190** J
AROCLOR-1260	38 U	**160** J	45 U	34 U	39 UJ	43 U	37 U
BETA-BHC	4 U	2 U	2 U	9 U	2 UJ	2 U	2 U
DELTA-BHC	4 U	2 U	2 U	9 U	2 UJ	2 U	2 U
DIELDRIN	**4** J	**6** J	5 U	3 U	4 UJ	4 U	4 U
ENDOSULFAN I	4 U	2 U	2 U	9 U	2 UJ	2 U	2 U
ENDOSULFAN II	4 U	4 U	5 U	3 U	4 UJ	4 U	4 U
ENDOSULFAN SULFATE	4 U	4 U	5 U	3 U	4 UJ	4 U	4 U
ENDRIN	4 U	4 U	5 U	3 U	4 UJ	4 U	4 U
ENDRIN ALDEHYDE	4 U	4 U	5 U	3 U	4 UJ	4 U	4 U
ENDRIN KETONE	4 U	4 U	5 U	3 U	4 UJ	4 U	4 U
GAMMA-BHC (LINDANE)	4 U	2 U	2 U	9 U	2 UJ	2 U	2 U
GAMMA-CHLORDANE	**6** J	**7** J	2 U	2 U	2 UJ	2 U	2 U
HEPTACHLOR	4 U	2 U	2 U	9 U	2 UJ	2 U	2 U
HEPTACHLOR EPOXIDE	4 U	2 U	2 U	9 U	2 UJ	2 U	2 U

TABLE B-1 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SOIL, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB	SB	SB	SB	SB	SB
Point Name:	B1-6	B1-6	B1-7	B1-7	B1-8	B1-8	B1-8
Sample ID:	273-S01-065	273-S01-066	273-S01-067	273-S01-068	273-S01-070	273-S01-071	273-S01-072
Sample Date:	11-JAN-94	11-JAN-94	08-JAN-94	08-JAN-94	08-JAN-94	08-JAN-94	08-JAN-94
Screen Depth (feet bgs):	3.5 to 4.5	8.0 to 9.0	0.0 to 1.0	3.0 to 4.0	0.0 to 1.0	3.5 to 4.5	7.5 to 8.5
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
DIOXIN (ug/kg)							
HEPTACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HEPTACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HEXACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HEXACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
OCTACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
OCTACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PENTACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PENTACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TETRACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TETRACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEST (ug/kg)							
4,4'-DDD	**99** J	**11** J	4 U	**16**	3 U	3 U	5 U
4,4'-DDE	**130** J	**18** J	**3** J	**10**	3 U	3 U	5 U
4,4'-DDT	**55**	5 UJ	**2** J	4 U	3 U	3 U	5 U
ALDRIN	20 U	50 UJ	2 U	2 U	2 U	2 U	2 U
ALPHA-BHC	20 U	3 UJ	2 U	2 U	2 U	2 U	2 U
ALPHA-CHLORDANE	20 U	**3** J	2 U	2 U	2 U	2 U	2 U
AROCLOR-1016	390 U	50 UJ	35 U	42 U	34 U	34 U	45 U
AROCLOR-1221	800 U	100 UJ	72 U	85 U	68 U	69 U	92 U
AROCLOR-1232	390 U	50 UJ	35 U	42 U	34 U	34 U	45 U
AROCLOR-1242	390 U	50 UJ	35 U	42 U	34 U	34 U	45 U
AROCLOR-1248	390 U	50 UJ	35 U	42 U	34 U	34 U	45 U
AROCLOR-1254	390 U	50 UJ	35 U	42 U	34 U	34 U	45 U
AROCLOR-1260	390 U	50 UJ	**17** J	42 U	34 U	34 U	45 U
BETA-BHC	20 U	**9** J	2 U	2 U	2 U	2 U	2 U
DELTA-BHC	20 U	**6** J	2 U	2 U	2 U	2 U	2 U
DIELDRIN	39 U	5 UJ	4 U	4 U	3 U	3 U	5 U
ENDOSULFAN I	20 U	**4** J	2 U	2 U	2 U	2 U	2 U
ENDOSULFAN II	39 U	5 UJ	4 U	4 U	3 U	3 U	5 U
ENDOSULFAN SULFATE	39 U	5 UJ	4 U	4 U	3 U	3 U	5 U
ENDRIN	39 U	5 UJ	4 U	4 U	3 U	3 U	5 U
ENDRIN ALDEHYDE	39 U	5 UJ	4 U	4 U	3 U	3 U	5 U
ENDRIN KETONE	**350**	5 UJ	4 U	4 U	3 U	3 U	5 U
GAMMA-BHC (LINDANE)	20 U	50 UJ	2 U	2 U	2 U	2 U	2 U
GAMMA-CHLORDANE	20 U	3 UJ	2 U	2 U	2 U	2 U	2 U
HEPTACHLOR	20 U	50 UJ	2 U	2 U	2 U	2 U	2 U
HEPTACHLOR EPOXIDE	20 U	50 UJ	2 U	2 U	2 U	2 U	2 U

TABLE B-1 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SOIL, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB	SB	SB	SB	SB	SB
Point Name:	MW1-5R	MW1-5R	MW1-8	MW1-8	MW1-8	MW1-8	MW1-9
Sample ID:	273-S01-121	273-S01-122	273-S01-073	273-S01-074	273-S01-123	273-S01-075	273-S01-076
Sample Date:	11-JAN-94	11-JAN-94	15-JAN-94	15-JAN-94	15-JAN-94	15-JAN-94	15-JAN-94
Screen Depth (feet bgs):	0.5 to 1.5	5.0 to 6.0	0.5 to 1.5	3.5 to 4.5	6.5 to 7.5	8.0 to 9.0	0.5 to 1.5
ECO Habitat:	UPLAND	UPLAND	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
DIOXIN (ug/kg)							
HEPTACHLORINATED DIBENZO-P-DIOXIN	2.4 U	2.4 U	N/A	N/A	N/A	N/A	N/A
HEPTACHLORINATED DIBENZOFURAN	2.4 U	2.4 U	N/A	N/A	N/A	N/A	N/A
HEXACHLORINATED DIBENZO-P-DIOXIN	2.4 U	2.4 U	N/A	N/A	N/A	N/A	N/A
HEXACHLORINATED DIBENZOFURAN	2.4 U	2.4 U	N/A	N/A	N/A	N/A	N/A
OCTACHLORINATED DIBENZO-P-DIOXIN	4.9 U	4.8 U	N/A	N/A	N/A	N/A	N/A
OCTACHLORINATED DIBENZOFURAN	4.9 U	4.8 U	N/A	N/A	N/A	N/A	N/A
PENTACHLORINATED DIBENZO-P-DIOXIN	2.4 U	2.4 U	N/A	N/A	N/A	N/A	N/A
PENTACHLORINATED DIBENZOFURAN	2.4 U	2.4 U	N/A	N/A	N/A	N/A	N/A
TETRACHLORINATED DIBENZO-P-DIOXIN	0.98 U	0.96 U	N/A	N/A	N/A	N/A	N/A
TETRACHLORINATED DIBENZOFURAN	0.98 U	0.96 U	N/A	N/A	N/A	N/A	N/A
PEST (ug/kg)							
4,4'-DDD	**27** J	4 U	3 U	3 U	4 U	**3** J	**5**
4,4'-DDE	**6**	**9** J	3 U	3 U	4 U	**18**	**7**
4,4'-DDT	4 U	4 U	3 U	3 U	4 U	5 U	**4** J
ALDRIN	2 U	2 U	2 U	2 U	2 U	3 U	2 U
ALPHA-BHC	2 U	2 U	2 U	2 U	2 U	3 U	2 U
ALPHA-CHLORDANE	**6** J	**4**	2 U	2 U	2 U	3 U	2 U
AROCLOR-1016	36 U	37 U	34 U	34 U	35 U	51 U	40 U
AROCLOR-1221	74 U	74 U	68 U	68 U	72 U	100 U	82 U
AROCLOR-1232	36 U	37 U	34 U	34 U	35 U	51 U	40 U
AROCLOR-1242	36 U	**620**	34 U	34 U	35 U	51 U	40 U
AROCLOR-1248	36 U	37 U	34 U	34 U	35 U	51 U	40 U
AROCLOR-1254	36 U	**100** J	34 U	34 U	35 U	51 U	40 U
AROCLOR-1260	**36** J	37 U	34 U	34 U	35 U	51 U	40 U
BETA-BHC	2 U	2 U	2 U	2 U	2 U	3 U	2 U
DELTA-BHC	2 U	2 U	2 U	2 U	2 U	3 U	2 U
DIELDRIN	4 U	4 U	3 U	3 U	4 U	5 U	4 U
ENDOSULFAN I	2 U	2 U	2 U	2 U	2 U	3 U	2 U
ENDOSULFAN II	4 U	4 U	3 U	3 U	4 U	5 U	4 U
ENDOSULFAN SULFATE	4 U	4 U	3 U	3 U	4 U	5 U	4 U
ENDRIN	4 U	4 U	3 U	3 U	4 U	5 U	4 U
ENDRIN ALDEHYDE	4 U	4 U	3 U	3 U	4 U	5 U	4 U
ENDRIN KETONE	4 U	4 U	3 U	3 U	4 U	5 U	4 U
GAMMA-BHC (LINDANE)	2 U	2 U	2 U	2 U	2 U	3 U	2 U
GAMMA-CHLORDANE	**3** J	**2** J	2 U	2 U	2 U	3 U	2 U
HEPTACHLOR	2 U	2 U	2 U	2 U	2 U	3 U	2 U
HEPTACHLOR EPOXIDE	2 U	2 U	2 U	2 U	2 U	3 U	2 U

TABLE B-1 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SOIL, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB
Point Name:	MW1-9	MW1-9
Sample ID:	273-S01-077	273-S01-078
Sample Date:	15-JAN-94	15-JAN-94
Screen Depth (feet bgs):	3.5 to 4.5	5.0 to 6.0
ECO Habitat:	TIDAL MARSH	TIDAL MARSH
DIOXIN (ug/kg)		
HEPTACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A
HEPTACHLORINATED DIBENZOFURAN	N/A	N/A
HEXACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A
HEXACHLORINATED DIBENZOFURAN	N/A	N/A
OCTACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A
OCTACHLORINATED DIBENZOFURAN	N/A	N/A
PENTACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A
PENTACHLORINATED DIBENZOFURAN	N/A	N/A
TETRACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A
TETRACHLORINATED DIBENZOFURAN	N/A	N/A
PEST (ug/kg)		
4,4'-DDD	5 UJ	5 U
4,4'-DDE	5 UJ	5 U
4,4'-DDT	5 UJ	5 U
ALDRIN	3 UJ	2 U
ALPHA-BHC	3 UJ	2 U
ALPHA-CHLORDANE	3 UJ	2 U
AROCLOR-1016	48 UJ	47 U
AROCLOR-1221	97 UJ	96 U
AROCLOR-1232	48 UJ	47 U
AROCLOR-1242	48 UJ	47 U
AROCLOR-1248	48 UJ	47 U
AROCLOR-1254	48 UJ	47 U
AROCLOR-1260	48 UJ	47 U
BETA-BHC	3 UJ	2 U
DELTA-BHC	3 UJ	2 U
DIELDRIN	5 UJ	5 U
ENDOSULFAN I	3 UJ	2 U
ENDOSULFAN II	5 UJ	5 U
ENDOSULFAN SULFATE	5 UJ	5 U
ENDRIN	5 UJ	5 U
ENDRIN ALDEHYDE	5 UJ	5 U
ENDRIN KETONE	5 UJ	5 U
GAMMA-BHC (LINDANE)	3 UJ	2 U
GAMMA-CHLORDANE	3 UJ	2 U
HEPTACHLOR	3 UJ	2 U
HEPTACHLOR EPOXIDE	3 UJ	2 U

TABLE B-1 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SOIL, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB	SB	SB	SB	SB	SB
Point Name:	B1-1	B1-1	B1-2	B1-2	B1-3	B1-3	B1-3
Sample ID:	273-S01-049	273-S01-050	273-S01-052	273-S01-053	273-S01-055	273-S01-056	273-S01-057
Sample Date:	08-JAN-94	08-JAN-94	11-JAN-94	11-JAN-94	18-JAN-94	18-JAN-94	18-JAN-94
Screen Depth (feet bgs):	0.0 to 1.0	2.5 to 3.5	0.5 to 1.5	3.5 to 4.5	0.0 to 1.0	3.0 to 4.0	6.0 to 6.5
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	UPLAND	UPLAND	UPLAND
PEST (ug/kg)							
METHOXYCHLOR	18 U	25 U	17 U	21 U	18 U	19 U	N/A
TOXAPHENE	180 U	250 U	170 U	210 U	180 U	190 U	N/A
SVOA (ug/kg)							
1,2,4-TRICHLOROBENZENE	350 U	480 U	340 U	410 U	350 U	370 U	N/A
1,2-DICHLOROBENZENE	350 U	480 U	340 U	410 U	350 U	370 U	N/A
1,3-DICHLOROBENZENE	350 U	480 U	340 U	410 U	350 U	370 U	N/A
1,4-DICHLOROBENZENE	350 U	480 U	340 U	410 U	350 U	370 U	N/A
2,2'-OXYBIS(1-CHLOROPROPANE)	350 U	480 U	340 U	410 U	350 U	370 U	N/A
2,4,5-TRICHLOROPHENOL	840 U	1,200 U	820 U	1,000 U	860 U	890 U	N/A
2,4,6-TRICHLOROPHENOL	350 U	480 U	340 U	410 U	350 U	370 U	N/A
2,4-DICHLOROPHENOL	350 U	480 U	340 U	410 U	350 U	370 U	N/A
2,4-DIMETHYLPHENOL	350 U	480 U	340 U	410 U	350 U	370 UJ	N/A
2,4-DINITROPHENOL	840 UJ	1,200 U	820 UJ	1,000 UJ	860 U	890 U	N/A
2,4-DINITROTOLUENE	350 U	480 U	340 U	410 U	350 U	370 U	N/A
2,6-DINITROTOLUENE	350 U	480 U	340 U	410 U	350 U	370 U	N/A
2-CHLORONAPHTHALENE	350 U	480 U	340 U	410 U	350 U	370 U	N/A
2-CHLOROPHENOL	350 U	480 U	340 U	410 U	350 U	370 U	N/A
2-METHYLNAPHTHALENE	350 UJ	480 U	340 U	410 U	350 U	370 U	N/A
2-METHYLPHENOL	350 U	480 U	340 U	410 U	350 U	370 U	N/A
2-NITROANILINE	840 U	1,200 U	820 U	1,000 U	860 U	890 U	N/A
2-NITROPHENOL	350 U	480 U	340 U	410 U	350 U	370 U	N/A
3,3'-DICHLOROBENZIDINE	350 U	480 U	340 U	410 U	350 U	370 U	N/A
3-NITROANILINE	840 U	1,200 U	820 U	1,000 U	860 U	N/A	N/A
4,6-DINITRO-2-METHYLPHENOL	840 U	1,200 U	820 UJ	1,000 UJ	860 U	890 U	N/A
4-BROMOPHENYL-PHENYLETHER	350 U	480 U	340 U	410 U	350 U	370 U	N/A
4-CHLORO-3-METHYLPHENOL	350 U	480 U	340 U	410 U	350 U	370 U	N/A
4-CHLOROANILINE	350 U	480 U	340 UJ	410 UJ	350 U	370 UJ	N/A
4-CHLOROPHENYL-PHENYLETHER	350 U	480 U	340 U	410 U	350 U	370 U	N/A
4-METHYLPHENOL	350 U	480 U	340 U	410 U	350 U	370 U	N/A
4-NITROANILINE	840 UJ	1,200 U	820 UJ	1,000 UJ	860 U	890 UJ	N/A
4-NITROPHENOL	840 UJ	1,200 UJ	820 UJ	1,000 UJ	860 U	890 U	N/A
ACENAPHTHENE	350 U	480 U	340 U	410 U	350 U	370 U	N/A
ACENAPHTHYLENE	350 U	480 U	340 U	410 U	350 U	370 U	N/A
ANTHRACENE	350 U	480 U	340 U	410 U	350 U	370 U	N/A
BENZO(A)ANTHRACENE	350 U	480 U	340 U	410 U	350 U	370 U	N/A
BENZO(A)PYRENE	350 U	480 U	340 U	410 U	350 UJ	370 U	N/A
BENZO(B)FLUORANTHENE	350 U	480 U	340 U	410 U	350 UJ	370 U	N/A

TABLE B-1 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SOIL, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB	SB	SB	SB	SB	SB
Point Name:	B1-4	B1-4	B1-4	B1-5	B1-5	B1-5	B1-6
Sample ID:	273-S01-058	273-S01-059	273-S01-060	273-S01-061	273-S01-062	273-S01-063	273-S01-064
Sample Date:	18-JAN-94	19-JAN-94	19-JAN-94	11-JAN-94	11-JAN-94	11-JAN-94	11-JAN-94
Screen Depth (feet bgs):	0.0 to 1.5	3.0 to 4.0	5.0 to 5.5	0.5 to 1.5	3.5 to 4.5	4.5 to 6.0	0.5 to 1.5
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
PEST (ug/kg)							
METHOXYCHLOR	20 U	22 U	23 U	17 U	20 UJ	22 U	19 U
TOXAPHENE	200 U	220 U	230 U	170 U	200 UJ	220 U	190 U
SVOA (ug/kg)							
1,2,4-TRICHLOROBENZENE	380 U	430 U	450 U	340 U	390 U	430 U	380 U
1,2-DICHLOROBENZENE	380 U	**2,900**	450 U	340 U	390 U	430 U	380 U
1,3-DICHLOROBENZENE	380 U	430 U	450 U	340 U	390 U	430 U	380 U
1,4-DICHLOROBENZENE	380 U	430 U	**810**	340 U	390 U	430 U	380 U
2,2'-OXYBIS(1-CHLOROPROPANE)	380 U	430 U	450 U	340 U	390 U	430 U	380 U
2,4,5-TRICHLOROPHENOL	920 U	1,000 U	1,100 U	820 U	950 U	1,000 U	920 U
2,4,6-TRICHLOROPHENOL	380 U	430 U	450 U	340 U	390 U	430 U	380 U
2,4-DICHLOROPHENOL	380 U	430 U	450 U	340 U	390 U	430 U	380 U
2,4-DIMETHYLPHENOL	380 UJ	430 U	450 U	340 U	390 U	430 U	380 U
2,4-DINITROPHENOL	920 U	1,000 U	1,100 U	820 UJ	950 UJ	N/A	N/A
2,4-DINITROTOLUENE	380 U	430 U	**510** J	340 U	390 U	430 U	380 U
2,6-DINITROTOLUENE	380 U	430 U	450 U	340 U	390 U	430 U	380 U
2-CHLORONAPHTHALENE	380 U	430 U	450 U	340 U	390 U	430 U	380 U
2-CHLOROPHENOL	380 U	430 U	450 U	340 U	390 U	430 U	380 U
2-METHYLNAPHTHALENE	380 U	**120** J	**940**	340 U	390 U	430 U	380 U
2-METHYLPHENOL	380 U	430 U	450 U	340 U	390 U	430 U	380 U
2-NITROANILINE	920 U	1,000 U	1,100 U	820 U	950 U	1,000 U	920 U
2-NITROPHENOL	380 U	430 U	450 U	340 U	390 U	430 U	380 U
3,3'-DICHLOROBENZIDINE	380 U	430 UJ	450 UJ	340 U	390 U	430 U	380 U
3-NITROANILINE	N/A	1,000 U	1,100 U	820 U	950 U	1,000 U	920 U
4,6-DINITRO-2-METHYLPHENOL	920 U	1,000 UJ	1,100 U	820 UJ	950 UJ	N/A	N/A
4-BROMOPHENYL-PHENYLETHER	380 U	430 UJ	450 U	340 U	390 U	430 U	380 U
4-CHLORO-3-METHYLPHENOL	380 U	430 U	450 U	340 U	390 U	430 U	380 U
4-CHLOROANILINE	380 UJ	430 U	450 U	340 UJ	390 UJ	430 U	380 U
4-CHLOROPHENYL-PHENYLETHER	380 U	430 U	450 U	340 U	390 U	430 U	380 U
4-METHYLPHENOL	380 U	430 U	450 U	340 U	390 U	430 U	380 U
4-NITROANILINE	920 UJ	1,000 U	1,100 U	820 UJ	950 UJ	1,000 U	920 U
4-NITROPHENOL	920 U	1,000 U	1,100 U	820 UJ	950 UJ	1,000 U	920 U
ACENAPHTHENE	380 U	430 U	**420** J	340 U	390 U	430 U	380 U
ACENAPHTHYLENE	380 U	430 U	450 U	340 U	390 U	430 U	380 U
ANTHRACENE	380 U	430 UJ	160 UJ	340 U	390 U	430 U	380 U
BENZO(A)ANTHRACENE	380 U	430 UJ	93 UJ	340 U	390 U	430 U	**61** J
BENZO(A)PYRENE	380 U	430 UJ	450 U	340 U	390 U	430 U	**86** J
BENZO(B)FLUORANTHENE	380 U	430 UJ	450 U	340 U	390 U	430 U	380 U

TABLE B-1 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SOIL, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB	SB	SB	SB	SB	SB
Point Name:	B1-6	B1-6	B1-7	B1-7	B1-8	B1-8	B1-8
Sample ID:	273-S01-065	273-S01-066	273-S01-067	273-S01-068	273-S01-070	273-S01-071	273-S01-072
Sample Date:	11-JAN-94	11-JAN-94	08-JAN-94	08-JAN-94	08-JAN-94	08-JAN-94	08-JAN-94
Screen Depth (feet bgs):	3.5 to 4.5	8.0 to 9.0	0.0 to 1.0	3.0 to 4.0	0.0 to 1.0	3.5 to 4.5	7.5 to 8.5
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
PEST (ug/kg)							
METHOXYCHLOR	200 U	26 UJ	18 U	22 U	17 U	18 U	23 U
TOXAPHENE	2,000 U	260 UJ	180 U	220 U	170 U	180 U	230 U
SVOA (ug/kg)							
1,2,4-TRICHLOROBENZENE	1,600 U	500 U	350 U	420 U	340 U	340 U	450 U
1,2-DICHLOROBENZENE	1,600 U	500 U	350 U	420 U	340 U	340 U	450 U
1,3-DICHLOROBENZENE	1,600 U	500 U	350 U	420 U	340 U	340 U	450 U
1,4-DICHLOROBENZENE	1,600 U	500 U	350 U	420 U	340 U	340 U	450 U
2,2'-OXYBIS(1-CHLOROPROPANE)	1,600 U	500 U	350 U	420 U	340 U	340 U	450 U
2,4,5-TRICHLOROPHENOL	3,800 U	1,200 U	860 U	1,000 U	820 U	820 U	1,100 U
2,4,6-TRICHLOROPHENOL	1,600 U	500 U	350 U	420 U	340 U	340 U	450 U
2,4-DICHLOROPHENOL	1,600 U	500 U	350 U	420 U	340 U	340 U	450 U
2,4-DIMETHYLPHENOL	1,600 U	500 U	350 U	420 U	340 U	340 U	450 U
2,4-DINITROPHENOL	3,800 UJ	1,200 UJ	860 U	1,000 U	820 UJ	820 U	1,100 U
2,4-DINITROTOLUENE	1,600 U	500 U	350 U	420 U	340 U	340 U	450 U
2,6-DINITROTOLUENE	1,600 U	500 U	350 U	420 U	340 U	340 U	450 U
2-CHLORONAPHTHALENE	1,600 U	500 U	350 U	420 U	340 U	340 U	450 U
2-CHLOROPHENOL	1,600 U	500 U	350 U	420 U	340 U	340 U	450 U
2-METHYLNAPHTHALENE	**520** J	**410** J	350 U	420 U	340 UJ	340 U	450 U
2-METHYLPHENOL	1,600 U	500 U	350 U	420 U	340 U	340 U	450 U
2-NITROANILINE	3,800 U	1,200 U	860 U	1,000 U	820 U	820 U	1,100 U
2-NITROPHENOL	1,600 U	500 U	350 U	420 U	340 U	340 U	450 U
3,3'-DICHLOROBENZIDINE	1,600 U	500 U	350 U	420 U	340 U	340 U	450 U
3-NITROANILINE	1,600 UJ	1,200 U	860 U	1,000 U	820 U	820 U	1,100 U
4,6-DINITRO-2-METHYLPHENOL	3,800 U	1,200 UJ	860 U	1,000 UJ	820 U	820 U	1,100 U
4-BROMOPHENYL-PHENYLETHER	1,600 U	500 U	350 U	420 U	340 U	340 U	450 U
4-CHLORO-3-METHYLPHENOL	1,600 U	500 U	350 U	420 U	340 U	340 U	450 U
4-CHLOROANILINE	1,600 UJ	500 UJ	350 U	420 U	340 U	340 U	450 U
4-CHLOROPHENYL-PHENYLETHER	1,600 U	500 U	350 U	420 U	340 U	340 U	450 U
4-METHYLPHENOL	1,600 U	500 U	350 U	420 U	340 U	340 U	450 U
4-NITROANILINE	3,800 U	1,200 UJ	860 U	1,000 U	820 UJ	820 U	1,100 U
4-NITROPHENOL	3,800 U	1,200 UJ	860 U	1,000 U	820 UJ	820 U	1,100 U
ACENAPHTHENE	**2,300**	500 U	350 U	420 U	340 U	340 U	450 U
ACENAPHTHYLENE	1,600 U	500 U	350 U	420 U	340 U	340 U	450 U
ANTHRACENE	**30,000** J	500 U	350 U	420 U	340 U	340 U	450 U
BENZO(A)ANTHRACENE	**64,000**	500 U	350 U	420 U	340 U	340 U	450 U
BENZO(A)PYRENE	**62,000** J	500 UJ	350 U	420 U	340 U	340 U	450 U
BENZO(B)FLUORANTHENE	**66,000** J	500 UJ	350 U	420 U	340 U	340 U	450 U

TABLE B-1 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SOIL, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB	SB	SB	SB	SB	SB
Point Name:	MW1-5R	MW1-5R	MW1-8	MW1-8	MW1-8	MW1-8	MW1-9
Sample ID:	273-S01-121	273-S01-122	273-S01-073	273-S01-074	273-S01-123	273-S01-075	273-S01-076
Sample Date:	11-JAN-94	11-JAN-94	15-JAN-94	15-JAN-94	15-JAN-94	15-JAN-94	15-JAN-94
Screen Depth (feet bgs):	0.5 to 1.5	5.0 to 6.0	0.5 to 1.5	3.5 to 4.5	6.5 to 7.5	8.0 to 9.0	0.5 to 1.5
ECO Habitat:	UPLAND	UPLAND	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
PEST (ug/kg)							
METHOXYCHLOR	19 U	19 U	17 U	17 U	18 U	26 U	21 U
TOXAPHENE	190 U	190 U	170 U	170 U	180 U	260 U	210 U
SVOA (ug/kg)							
1,2,4-TRICHLOROBENZENE	370 U	360 U	340 U	340 U	350 U	510 U	400 U
1,2-DICHLOROBENZENE	370 U	360 U	340 U	340 U	350 U	510 U	400 U
1,3-DICHLOROBENZENE	370 U	360 U	340 U	340 U	350 U	510 U	400 U
1,4-DICHLOROBENZENE	370 U	**310** J	340 U	340 U	350 U	510 U	400 U
2,2'-OXYBIS(1-CHLOROPROPANE)	370 U	360 U	340 U	340 U	350 U	510 U	400 U
2,4,5-TRICHLOROPHENOL	890 U	880 U	820 U	820 U	860 U	1,200 U	980 U
2,4,6-TRICHLOROPHENOL	370 U	360 U	340 U	340 U	350 U	510 U	400 U
2,4-DICHLOROPHENOL	370 U	360 U	340 U	340 U	350 U	510 U	400 U
2,4-DIMETHYLPHENOL	370 U	360 U	340 U	340 U	350 U	510 U	400 U
2,4-DINITROPHENOL	890 UJ	880 UJ	820 UJ	820 UJ	860 UJ	1,200 UJ	980 UJ
2,4-DINITROTOLUENE	370 U	360 U	340 U	340 U	350 U	510 U	400 U
2,6-DINITROTOLUENE	370 U	360 U	340 U	340 U	350 U	510 U	400 U
2-CHLORONAPHTHALENE	370 U	360 U	340 U	340 U	350 U	510 U	400 U
2-CHLOROPHENOL	370 U	360 U	340 U	340 U	350 U	510 U	400 U
2-METHYLNAPHTHALENE	370 U	360 U	340 U	340 U	350 U	510 U	400 U
2-METHYLPHENOL	370 U	360 U	340 U	340 U	350 U	510 U	400 U
2-NITROANILINE	890 U	880 U	820 U	820 U	860 U	1,200 U	980 U
2-NITROPHENOL	370 U	360 U	340 U	340 U	350 U	510 U	400 U
3,3'-DICHLOROBENZIDINE	370 U	360 U	340 U	340 U	350 U	510 U	400 U
3-NITROANILINE	890 U	880 U	820 U	820 U	860 U	1,200 U	980 U
4,6-DINITRO-2-METHYLPHENOL	890 UJ	880 UJ	820 U	820 U	860 U	1,200 U	980 U
4-BROMOPHENYL-PHENYLETHER	370 U	360 U	340 U	340 U	350 U	510 U	400 U
4-CHLORO-3-METHYLPHENOL	370 U	360 U	340 U	340 U	350 U	510 U	400 U
4-CHLOROANILINE	370 UJ	360 UJ	340 U	340 U	350 U	510 U	400 U
4-CHLOROPHENYL-PHENYLETHER	370 U	360 U	340 U	340 U	350 U	510 U	400 U
4-METHYLPHENOL	370 U	**230** J	340 U	340 U	350 U	510 U	400 U
4-NITROANILINE	890 UJ	880 UJ	820 U	820 U	860 U	1,200 U	980 U
4-NITROPHENOL	890 UJ	880 UJ	820 U	820 U	860 U	**57** J	980 U
ACENAPHTHENE	370 U	360 U	340 U	340 U	350 U	510 U	400 U
ACENAPHTHYLENE	370 U	360 U	340 U	340 U	350 U	510 U	400 U
ANTHRACENE	370 U	360 U	340 U	340 U	350 U	510 U	400 U
BENZO(A)ANTHRACENE	370 U	360 U	340 U	340 U	350 U	510 U	400 U
BENZO(A)PYRENE	370 UJ	360 UJ	340 U	340 U	350 U	510 U	400 U
BENZO(B)FLUORANTHENE	370 UJ	360 UJ	340 U	340 U	350 U	510 U	400 U

TABLE B-1 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SOIL, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB
Point Name:	MW1-9	MW1-9
Sample ID:	273-S01-077	273-S01-078
Sample Date:	15-JAN-94	15-JAN-94
Screen Depth (feet bgs):	3.5 to 4.5	5.0 to 6.0
ECO Habitat:	TIDAL MARSH	TIDAL MARSH
PEST (ug/kg)		
METHOXYCHLOR	25 UJ	24 U
TOXAPHENE	250 UJ	240 U
SVOA (ug/kg)		
1,2,4-TRICHLOROBENZENE	480 U	470 U
1,2-DICHLOROBENZENE	480 U	470 U
1,3-DICHLOROBENZENE	480 U	470 U
1,4-DICHLOROBENZENE	480 U	470 U
2,2'-OXYBIS(1-CHLOROPROPANE)	480 U	470 U
2,4,5-TRICHLOROPHENOL	1,200 U	1,100 U
2,4,6-TRICHLOROPHENOL	480 U	470 U
2,4-DICHLOROPHENOL	480 U	470 U
2,4-DIMETHYLPHENOL	480 U	470 U
2,4-DINITROPHENOL	1,200 UJ	1,100 UJ
2,4-DINITROTOLUENE	480 U	470 U
2,6-DINITROTOLUENE	480 U	470 U
2-CHLORONAPHTHALENE	480 U	470 U
2-CHLOROPHENOL	480 U	470 U
2-METHYLNAPHTHALENE	480 U	470 U
2-METHYLPHENOL	480 U	470 U
2-NITROANILINE	1,200 U	1,100 U
2-NITROPHENOL	480 U	470 U
3,3'-DICHLOROBENZIDINE	480 U	470 U
3-NITROANILINE	1,200 U	1,100 U
4,6-DINITRO-2-METHYLPHENOL	1,200 U	1,100 U
4-BROMOPHENYL-PHENYLETHER	480 U	470 U
4-CHLORO-3-METHYLPHENOL	480 U	470 U
4-CHLOROANILINE	480 U	470 U
4-CHLOROPHENYL-PHENYLETHER	480 U	470 U
4-METHYLPHENOL	480 U	470 U
4-NITROANILINE	1,200 U	1,100 U
4-NITROPHENOL	1,200 U	1,100 U
ACENAPHTHENE	480 U	470 U
ACENAPHTHYLENE	480 U	470 U
ANTHRACENE	480 U	470 U
BENZO(A)ANTHRACENE	480 U	470 U
BENZO(A)PYRENE	480 U	470 U
BENZO(B)FLUORANTHENE	480 U	470 U

TABLE B-1 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SOIL, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB	SB	SB	SB	SB	SB
Point Name:	B1-1	B1-1	B1-2	B1-2	B1-3	B1-3	B1-3
Sample ID:	273-S01-049	273-S01-050	273-S01-052	273-S01-053	273-S01-055	273-S01-056	273-S01-057
Sample Date:	08-JAN-94	08-JAN-94	11-JAN-94	11-JAN-94	18-JAN-94	18-JAN-94	18-JAN-94
Screen Depth (feet bgs):	0.0 to 1.0	2.5 to 3.5	0.5 to 1.5	3.5 to 4.5	0.0 to 1.0	3.0 to 4.0	6.0 to 6.5
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	UPLAND	UPLAND	UPLAND
SVOA (ug/kg)							
BENZO(G,H,I)PERYLENE	350 U	480 U	340 U	410 U	350 UJ	370 U	N/A
BENZO(K)FLUORANTHENE	350 U	480 U	340 U	410 U	350 UJ	370 U	N/A
BIS(2-CHLOROETHOXY)METHANE	350 U	480 U	340 U	410 U	350 U	370 U	N/A
BIS(2-CHLOROETHYL)ETHER	350 U	480 U	340 U	410 U	350 U	370 U	N/A
BIS(2-ETHYLHEXYL)PHTHALATE	350 UJ	480 UJ	340 UJ	410 UJ	350 UJ	370 U	N/A
BUTYLBENZYLPHTHALATE	350 U	480 U	340 U	410 U	350 U	370 U	N/A
CARBAZOLE	350 U	480 U	340 UJ	410 UJ	350 U	370 UJ	N/A
CHRYSENE	350 U	480 U	340 U	410 U	350 U	370 U	N/A
DI-N-BUTYLPHTHALATE	350 UJ	480 U	340 U	410 U	350 U	370 U	N/A
DI-N-OCTYLPHTHALATE	350 U	480 U	340 U	410 U	350 UJ	370 U	N/A
DIBENZO(A,H)ANTHRACENE	350 U	480 U	340 U	410 U	350 UJ	370 U	N/A
DIBENZOFURAN	350 U	480 U	340 U	410 U	350 U	370 U	N/A
DIETHYLPHTHALATE	350 UJ	480 U	340 U	410 U	350 U	370 U	N/A
DIMETHYLPHTHALATE	350 U	480 U	340 U	410 U	350 U	370 U	N/A
FLUORANTHENE	350 U	480 U	340 U	410 U	**52** J	370 U	N/A
FLUORENE	350 U	480 U	340 U	410 U	350 U	370 U	N/A
HEXACHLOROBENZENE	350 U	480 U	340 U	410 U	350 U	370 U	N/A
HEXACHLOROBUTADIENE	350 U	480 U	340 U	410 U	350 U	370 U	N/A
HEXACHLOROCYCLOPENTADIENE	350 U	480 U	340 U	410 U	350 U	370 U	N/A
HEXACHLOROETHANE	350 U	480 U	340 UJ	410 UJ	350 U	370 U	N/A
INDENO(1,2,3-CD)PYRENE	350 U	480 U	340 U	410 U	350 UJ	370 U	N/A
ISOPHORONE	350 U	480 U	340 U	410 U	350 U	370 U	N/A
N-NITROSO-DI-N-PROPYLAMINE	350 U	480 U	340 U	410 U	350 U	370 U	N/A
N-NITROSODIPHENYLAMINE	350 U	480 U	340 U	410 U	350 U	370 UJ	N/A
NAPHTHALENE	350 UJ	480 U	340 U	410 U	350 U	370 U	N/A
NITROBENZENE	350 U	480 U	340 U	410 U	350 U	370 U	N/A
PENTACHLOROPHENOL	840 U	1,200 U	820 U	1,000 U	860 U	890 UJ	N/A
PHENANTHRENE	350 U	480 U	340 U	410 U	350 U	370 U	N/A
PHENOL	350 U	480 U	340 U	410 U	350 UJ	370 U	N/A
PYRENE	350 U	480 U	340 U	410 U	**56** J	370 U	N/A
TPHEXT (mg/kg)							
OTHER HEAVY TPH COMPONENTS	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TPHPRG (mg/kg)							
GASOLINE RANGE ORGANICS	N/A	N/A	N/A	N/A	N/A	N/A	N/A
VOA (ug/kg)							
1,1,1-TRICHLOROETHANE	11 U	14 U	10 U	12 U	11 UJ	11 UJ	17 U
1,1,2,2-TETRACHLOROETHANE	11 U	14 U	10 U	12 U	11 UJ	11 UJ	17 U

TABLE B-1 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SOIL, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB	SB	SB	SB	SB	SB
Point Name:	B1-4	B1-4	B1-4	B1-5	B1-5	B1-5	B1-6
Sample ID:	273-S01-058	273-S01-059	273-S01-060	273-S01-061	273-S01-062	273-S01-063	273-S01-064
Sample Date:	18-JAN-94	19-JAN-94	19-JAN-94	11-JAN-94	11-JAN-94	11-JAN-94	11-JAN-94
Screen Depth (feet bgs):	0.0 to 1.5	3.0 to 4.0	5.0 to 5.5	0.5 to 1.5	3.5 to 4.5	4.5 to 6.0	0.5 to 1.5
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
SVOA (ug/kg)							
BENZO(G,H,I)PERYLENE	380 U	430 UJ	450 U	340 U	390 U	430 U	**53** J
BENZO(K)FLUORANTHENE	380 U	430 UJ	450 U	340 U	390 U	430 U	380 U
BIS(2-CHLOROETHOXY)METHANE	380 U	430 U	450 U	340 U	390 U	430 U	380 U
BIS(2-CHLOROETHYL)ETHER	380 U	430 U	450 U	340 U	390 U	430 U	380 U
BIS(2-ETHYLHEXYL)PHTHALATE	380 UJ	390 UJ	2,300 UJ	340 UJ	390 U	430 UJ	380 UJ
BUTYLBENZYLPHTHALATE	380 U	2,100 UJ	450 UJ	340 U	390 U	430 U	380 U
CARBAZOLE	380 UJ	430 UJ	450 U	340 UJ	390 UJ	430 U	380 U
CHRYSENE	380 U	430 UJ	450 UJ	340 U	390 U	430 U	**93** J
DI-N-BUTYLPHTHALATE	380 U	430 UJ	450 U	340 U	390 U	430 UJ	380 UJ
DI-N-OCTYLPHTHALATE	380 U	430 UJ	450 U	340 U	390 U	430 U	380 U
DIBENZO(A,H)ANTHRACENE	380 U	430 UJ	450 U	340 U	390 U	430 U	380 U
DIBENZOFURAN	380 U	430 U	**160** J	340 U	390 U	430 U	380 U
DIETHYLPHTHALATE	380 U	430 U	450 U	340 U	390 U	430 U	380 U
DIMETHYLPHTHALATE	380 U	430 U	450 U	340 U	390 U	430 U	380 U
FLUORANTHENE	380 U	430 UJ	450 U	340 U	390 U	430 U	**170** J
FLUORENE	380 U	430 U	**160** J	340 U	390 U	430 U	380 U
HEXACHLOROBENZENE	380 U	430 UJ	450 U	340 U	390 U	430 U	380 U
HEXACHLOROBUTADIENE	380 U	430 U	450 U	340 U	390 U	430 U	380 U
HEXACHLOROCYCLOPENTADIENE	380 U	430 U	450 U	340 U	390 U	430 U	380 U
HEXACHLOROETHANE	380 U	430 U	450 U	340 UJ	390 UJ	430 U	380 U
INDENO(1,2,3-CD)PYRENE	380 U	430 UJ	450 U	340 U	390 U	430 U	380 U
ISOPHORONE	380 U	430 U	**120** J	340 U	390 U	430 U	380 U
N-NITROSO-DI-N-PROPYLAMINE	380 U	430 U	450 U	340 U	390 U	430 U	380 U
N-NITROSODIPHENYLAMINE	380 UJ	430 UJ	450 U	340 U	390 U	430 U	380 U
NAPHTHALENE	380 U	**700**	**5,700**	340 U	390 U	430 U	380 U
NITROBENZENE	380 U	430 U	450 U	340 U	390 U	430 U	380 U
PENTACHLOROPHENOL	920 UJ	1,000 UJ	1,100 U	820 U	950 U	1,000 U	920 U
PHENANTHRENE	380 U	430 UJ	**160** J	340 U	390 U	430 U	**130** J
PHENOL	380 U	430 UJ	450 U	340 U	390 U	430 U	380 U
PYRENE	380 U	**280** J	450 UJ	340 U	390 U	430 U	**160** J
TPHEXT (mg/kg)							
OTHER HEAVY TPH COMPONENTS	N/A	**560**	**1,200**	N/A	N/A	N/A	N/A
TPHPRG (mg/kg)							
GASOLINE RANGE ORGANICS	N/A	**0.8** J	**4** J	N/A	N/A	N/A	N/A
VOA (ug/kg)							
1,1,1-TRICHLOROETHANE	11 UJ	13 UJ	14 UJ	10 U	12 U	13 UJ	11 U
1,1,2,2-TETRACHLOROETHANE	11 UJ	13 UJ	14 UJ	10 U	12 U	13 UJ	11 U

TABLE B-1 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SOIL, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB	SB	SB	SB	SB	SB
Point Name:	B1-6	B1-6	B1-7	B1-7	B1-8	B1-8	B1-8
Sample ID:	273-S01-065	273-S01-066	273-S01-067	273-S01-068	273-S01-070	273-S01-071	273-S01-072
Sample Date:	11-JAN-94	11-JAN-94	08-JAN-94	08-JAN-94	08-JAN-94	08-JAN-94	08-JAN-94
Screen Depth (feet bgs):	3.5 to 4.5	8.0 to 9.0	0.0 to 1.0	3.0 to 4.0	0.0 to 1.0	3.5 to 4.5	7.5 to 8.5
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
SVOA (ug/kg)							
BENZO(G,H,I)PERYLENE	**12,000** J	500 UJ	350 U	420 U	340 U	340 U	450 U
BENZO(K)FLUORANTHENE	**29,000** J	500 UJ	350 U	420 U	340 U	340 U	450 U
BIS(2-CHLOROETHOXY)METHANE	1,600 U	500 U	350 U	420 U	340 U	340 U	450 U
BIS(2-CHLOROETHYL)ETHER	1,600 U	500 U	350 U	420 U	340 U	340 U	450 U
BIS(2-ETHYLHEXYL)PHTHALATE	1,600 U	500 UJ	350 U	420 UJ	340 UJ	340 UJ	450 UJ
BUTYLBENZYLPHTHALATE	1,600 U	500 U	350 U	420 U	340 U	340 U	450 U
CARBAZOLE	**13,000** J	500 UJ	350 U	420 U	340 U	340 U	450 U
CHRYSENE	**70,000**	500 U	350 U	420 U	340 U	340 U	450 U
DI-N-BUTYLPHTHALATE	1,600 UJ	500 U	350 UJ	420 UJ	340 U	340 U	450 UJ
DI-N-OCTYLPHTHALATE	1,600 UJ	500 UJ	350 U	420 U	340 U	340 U	450 U
DIBENZO(A,H)ANTHRACENE	1,600 U	500 UJ	350 U	420 U	340 U	340 U	450 U
DIBENZOFURAN	**4,000**	500 U	350 U	420 U	340 U	340 U	450 U
DIETHYLPHTHALATE	1,600 U	500 U	350 U	420 U	340 U	340 U	450 U
DIMETHYLPHTHALATE	1,600 U	500 U	350 U	420 U	340 U	340 U	450 U
FLUORANTHENE	**150,000**	**200** J	350 U	420 U	340 U	340 U	450 U
FLUORENE	**6,900**	**79** J	350 U	420 U	340 U	340 U	450 U
HEXACHLOROBENZENE	1,600 U	500 U	350 U	420 U	340 U	340 U	450 U
HEXACHLOROBUTADIENE	1,600 U	500 U	350 U	420 U	340 U	340 U	450 U
HEXACHLOROCYCLOPENTADIENE	1,600 U	500 U	350 U	420 U	340 U	340 U	450 U
HEXACHLOROETHANE	1,600 UJ	500 UJ	350 U	420 U	340 U	340 U	450 U
INDENO(1,2,3-CD)PYRENE	**29,000** J	500 UJ	350 U	420 U	340 U	340 U	450 U
ISOPHORONE	1,600 U	500 U	350 U	420 U	340 U	340 U	450 U
N-NITROSO-DI-N-PROPYLAMINE	1,600 U	500 U	350 U	420 U	340 U	340 U	450 U
N-NITROSODIPHENYLAMINE	1,600 U	500 U	350 U	420 U	340 U	340 U	450 U
NAPHTHALENE	**470** J	**1,000**	350 UJ	420 U	340 UJ	340 UJ	450 UJ
NITROBENZENE	1,600 U	500 U	350 U	420 U	340 U	340 U	450 U
PENTACHLOROPHENOL	3,800 UJ	1,200 UJ	860 U	1,000 U	820 U	820 U	1,100 U
PHENANTHRENE	**130,000**	**490** J	350 U	420 U	340 U	340 U	450 U
PHENOL	1,600 U	500 U	350 U	420 U	340 U	340 U	450 U
PYRENE	**160,000**	500 U	350 U	420 U	340 U	340 U	450 U
TPHEXT (mg/kg)							
OTHER HEAVY TPH COMPONENTS	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TPHPRG (mg/kg)							
GASOLINE RANGE ORGANICS	N/A	N/A	N/A	N/A	N/A	N/A	N/A
VOA (ug/kg)							
1,1,1-TRICHLOROETHANE	12 U	15 U	11 U	13 U	10 U	10 U	14 U
1,1,2,2-TETRACHLOROETHANE	12 U	15 UJ	11 U	13 U	10 U	10 U	14 U

TABLE B-1 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SOIL, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB	SB	SB	SB	SB	SB
Point Name:	MW1-5R	MW1-5R	MW1-8	MW1-8	MW1-8	MW1-8	MW1-9
Sample ID:	273-S01-121	273-S01-122	273-S01-073	273-S01-074	273-S01-123	273-S01-075	273-S01-076
Sample Date:	11-JAN-94	11-JAN-94	15-JAN-94	15-JAN-94	15-JAN-94	15-JAN-94	15-JAN-94
Screen Depth (feet bgs):	0.5 to 1.5	5.0 to 6.0	0.5 to 1.5	3.5 to 4.5	6.5 to 7.5	8.0 to 9.0	0.5 to 1.5
ECO Habitat:	UPLAND	UPLAND	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
SVOA (ug/kg)							
BENZO(G,H,I)PERYLENE	370 UJ	360 UJ	340 U	340 U	350 U	510 U	400 U
BENZO(K)FLUORANTHENE	370 UJ	360 UJ	340 U	340 U	350 U	510 U	400 U
BIS(2-CHLOROETHOXY)METHANE	370 U	360 U	340 U	340 U	350 U	510 U	400 U
BIS(2-CHLOROETHYL)ETHER	370 U	360 U	340 U	340 U	350 U	510 U	400 U
BIS(2-ETHYLHEXYL)PHTHALATE	370 U	1,800 UJ	340 UJ	340 UJ	350 UJ	510 UJ	400 UJ
BUTYLBENZYLPHTHALATE	370 U	360 U	340 UJ	340 UJ	350 UJ	510 UJ	400 UJ
CARBAZOLE	370 UJ	360 UJ	340 U	340 U	350 U	510 U	400 U
CHRYSENE	370 U	360 U	340 U	340 U	350 U	510 U	400 U
DI-N-BUTYLPHTHALATE	370 U	360 U	340 U	340 U	350 U	510 UJ	400 U
DI-N-OCTYLPHTHALATE	370 UJ	360 UJ	340 UJ	340 UJ	350 UJ	510 UJ	400 UJ
DIBENZO(A,H)ANTHRACENE	370 UJ	360 UJ	340 U	340 U	350 U	510 U	400 U
DIBENZOFURAN	370 U	360 U	340 U	340 U	350 U	510 U	400 U
DIETHYLPHTHALATE	370 U	360 U	340 U	340 U	350 U	510 U	400 U
DIMETHYLPHTHALATE	370 U	360 U	340 U	340 U	350 U	510 U	400 U
FLUORANTHENE	370 U	360 U	340 U	340 U	350 U	510 U	400 U
FLUORENE	370 U	360 U	340 U	340 U	350 U	510 U	400 U
HEXACHLOROBENZENE	370 U	360 U	340 U	340 U	350 U	510 U	400 U
HEXACHLOROBUTADIENE	370 U	360 U	340 U	340 U	350 U	510 U	400 U
HEXACHLOROCYCLOPENTADIENE	370 U	360 U	340 U	340 U	350 U	510 U	400 U
HEXACHLOROETHANE	370 UJ	360 UJ	340 U	340 U	350 U	510 U	400 U
INDENO(1,2,3-CD)PYRENE	370 UJ	360 UJ	340 U	340 U	350 U	510 U	400 U
ISOPHORONE	370 U	360 U	340 U	340 U	350 U	510 U	400 U
N-NITROSO-DI-N-PROPYLAMINE	370 U	360 U	340 U	340 U	350 U	510 U	400 U
N-NITROSODIPHENYLAMINE	370 U	360 U	340 U	340 U	350 U	510 U	400 U
NAPHTHALENE	370 U	**170** J	340 U	340 U	350 U	510 U	400 U
NITROBENZENE	370 U	360 U	340 U	340 U	350 U	510 U	400 U
PENTACHLOROPHENOL	890 UJ	880 UJ	820 U	820 U	860 U	1,200 U	980 U
PHENANTHRENE	370 U	360 U	340 U	340 U	350 U	510 U	400 U
PHENOL	370 U	360 U	340 U	340 UJ	350 U	510 UJ	400 U
PYRENE	370 U	360 U	340 U	340 U	350 U	**31** J	400 U
TPHEXT (mg/kg)							
OTHER HEAVY TPH COMPONENTS	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TPHPRG (mg/kg)							
GASOLINE RANGE ORGANICS	N/A	N/A	N/A	N/A	N/A	N/A	N/A
VOA (ug/kg)							
1,1,1-TRICHLOROETHANE	11 UJ	11 U	10 U	10 U	11 U	15 U	12 U
1,1,2,2-TETRACHLOROETHANE	11 UJ	11 U	10 UJ	10 UJ	11 U	15 UJ	12 UJ

TABLE B-1 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SOIL, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB
Point Name:	MW1-9	MW1-9
Sample ID:	273-S01-077	273-S01-078
Sample Date:	15-JAN-94	15-JAN-94
Screen Depth (feet bgs):	3.5 to 4.5	5.0 to 6.0
ECO Habitat:	TIDAL MARSH	TIDAL MARSH
SVOA (ug/kg)		
BENZO(G,H,I)PERYLENE	480 U	470 U
BENZO(K)FLUORANTHENE	480 U	470 U
BIS(2-CHLOROETHOXY)METHANE	480 U	470 U
BIS(2-CHLOROETHYL)ETHER	480 U	470 U
BIS(2-ETHYLHEXYL)PHTHALATE	480 UJ	470 UJ
BUTYLBENZYLPHTHALATE	480 UJ	470 UJ
CARBAZOLE	480 U	470 U
CHRYSENE	480 U	470 U
DI-N-BUTYLPHTHALATE	480 UJ	470 UJ
DI-N-OCTYLPHTHALATE	480 UJ	470 UJ
DIBENZO(A,H)ANTHRACENE	480 U	470 U
DIBENZOFURAN	480 U	470 U
DIETHYLPHTHALATE	480 U	470 U
DIMETHYLPHTHALATE	480 U	470 U
FLUORANTHENE	480 U	470 U
FLUORENE	480 U	470 U
HEXACHLOROBENZENE	480 U	470 U
HEXACHLOROBUTADIENE	480 U	470 U
HEXACHLOROCYCLOPENTADIENE	480 U	470 U
HEXACHLOROETHANE	480 U	470 U
INDENO(1,2,3-CD)PYRENE	480 U	470 U
ISOPHORONE	480 U	470 U
N-NITROSO-DI-N-PROPYLAMINE	480 U	470 U
N-NITROSODIPHENYLAMINE	480 U	470 U
NAPHTHALENE	480 U	470 U
NITROBENZENE	480 U	470 U
PENTACHLOROPHENOL	1,200 U	1,100 U
PHENANTHRENE	480 U	470 U
PHENOL	480 U	470 UJ
PYRENE	480 U	470 U
TPHEXT (mg/kg)		
OTHER HEAVY TPH COMPONENTS	N/A	N/A
TPHPRG (mg/kg)		
GASOLINE RANGE ORGANICS	N/A	N/A
VOA (ug/kg)		
1,1,1-TRICHLOROETHANE	14 U	14 U
1,1,2,2-TETRACHLOROETHANE	14 UJ	14 UJ

TABLE B-1 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SOIL, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB	SB	SB	SB	SB	SB
Point Name:	B1-1	B1-1	B1-2	B1-2	B1-3	B1-3	B1-3
Sample ID:	273-S01-049	273-S01-050	273-S01-052	273-S01-053	273-S01-055	273-S01-056	273-S01-057
Sample Date:	08-JAN-94	08-JAN-94	11-JAN-94	11-JAN-94	18-JAN-94	18-JAN-94	18-JAN-94
Screen Depth (feet bgs):	0.0 to 1.0	2.5 to 3.5	0.5 to 1.5	3.5 to 4.5	0.0 to 1.0	3.0 to 4.0	6.0 to 6.5
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	UPLAND	UPLAND	UPLAND
VOA (ug/kg)							
1,1,2-TRICHLOROETHANE	11 U	14 U	10 U	12 U	11 UJ	11 UJ	17 U
1,1-DICHLOROETHANE	11 U	14 U	10 U	12 U	11 UJ	11 UJ	17 U
1,1-DICHLOROETHENE	11 U	14 U	10 U	12 U	11 UJ	11 UJ	17 U
1,2-DICHLOROETHANE	11 U	14 U	10 U	12 U	11 UJ	11 UJ	17 U
1,2-DICHLOROETHENE (TOTAL)	11 U	14 U	10 U	12 U	11 UJ	11 UJ	17 U
1,2-DICHLOROPROPANE	11 U	14 U	10 U	12 U	11 UJ	11 UJ	17 U
2-BUTANONE	11 UJ	14 U	10 UJ	12 UJ	11 UJ	11 UJ	17 UJ
2-HEXANONE	11 UJ	14 U	10 UJ	12 U	11 UJ	11 UJ	17 UJ
4-METHYL-2-PENTANONE	11 UJ	14 U	10 UJ	12 U	11 UJ	11 UJ	17 U
ACETONE	11 UJ	70 UJ	50 UJ	120 UJ	55 UJ	55 UJ	170 UJ
BENZENE	11 U	14 U	10 U	12 U	11 UJ	11 UJ	17 U
BROMODICHLOROMETHANE	11 U	14 U	10 U	12 U	11 UJ	11 UJ	17 U
BROMOFORM	11 U	14 UJ	10 U	12 U	11 UJ	11 UJ	17 U
BROMOMETHANE	11 U	14 U	10 UJ	12 U	11 UJ	11 UJ	17 U
CARBON DISULFIDE	11 U	14 U	10 U	12 U	11 UJ	11 UJ	17 U
CARBON TETRACHLORIDE	11 U	14 U	10 U	12 U	11 UJ	11 UJ	17 U
CHLOROBENZENE	11 U	14 U	10 U	12 U	11 UJ	11 UJ	**48**
CHLOROETHANE	11 U	14 U	10 UJ	12 U	11 UJ	11 UJ	17 UJ
CHLOROFORM	11 U	14 U	10 U	12 U	11 UJ	11 UJ	17 U
CHLOROMETHANE	11 UJ	14 UJ	10 U	12 U	11 UJ	11 UJ	17 U
CIS-1,3-DICHLOROPROPENE	11 U	14 U	10 U	12 U	11 UJ	11 UJ	17 U
DIBROMOCHLOROMETHANE	11 U	14 U	10 U	12 U	11 UJ	11 UJ	17 U
ETHYLBENZENE	11 U	14 U	10 U	12 U	11 UJ	11 UJ	17 U
METHYLENE CHLORIDE	11 UJ	70 UJ	10 UJ	12 U	55 UJ	11 UJ	85 UJ
STYRENE	11 U	14 U	10 U	12 U	11 UJ	11 UJ	17 U
TETRACHLOROETHENE	11 U	14 U	10 U	12 U	11 UJ	11 UJ	17 U
TOLUENE	11 U	14 UJ	10 UJ	12 UJ	11 UJ	11 UJ	**7** J
TRANS-1,3-DICHLOROPROPENE	11 U	14 U	10 UJ	12 U	11 UJ	11 UJ	17 U
TRICHLOROETHENE	11 U	14 U	10 U	12 U	11 UJ	11 UJ	17 U
VINYL CHLORIDE	11 U	14 U	10 U	12 U	11 UJ	11 UJ	17 U
XYLENE (TOTAL)	11 U	14 U	10 U	12 U	11 UJ	11 UJ	**27**

TABLE B-1 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SOIL, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB	SB	SB	SB	SB	SB
Point Name:	B1-4	B1-4	B1-4	B1-5	B1-5	B1-5	B1-6
Sample ID:	273-S01-058	273-S01-059	273-S01-060	273-S01-061	273-S01-062	273-S01-063	273-S01-064
Sample Date:	18-JAN-94	19-JAN-94	19-JAN-94	11-JAN-94	11-JAN-94	11-JAN-94	11-JAN-94
Screen Depth (feet bgs):	0.0 to 1.5	3.0 to 4.0	5.0 to 5.5	0.5 to 1.5	3.5 to 4.5	4.5 to 6.0	0.5 to 1.5
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
VOA (ug/kg)							
1,1,2-TRICHLOROETHANE	11 UJ	13 UJ	14 UJ	10 U	12 U	13 UJ	11 U
1,1-DICHLOROETHANE	11 UJ	13 U	14 UJ	10 U	12 U	13 UJ	11 U
1,1-DICHLOROETHENE	11 UJ	13 U	14 UJ	10 U	12 U	13 UJ	11 U
1,2-DICHLOROETHANE	11 UJ	13 U	14 UJ	10 U	12 U	13 UJ	11 U
1,2-DICHLOROETHENE (TOTAL)	11 UJ	13 U	14 UJ	10 U	12 U	13 UJ	11 U
1,2-DICHLOROPROPANE	11 UJ	13 UJ	14 UJ	10 U	12 U	13 UJ	11 U
2-BUTANONE	11 UJ	13 UJ	14 UJ	10 U	12 UJ	13 UJ	11 UJ
2-HEXANONE	11 UJ	13 UJ	14 UJ	10 U	12 U	13 UJ	11 UJ
4-METHYL-2-PENTANONE	11 UJ	13 UJ	14 UJ	10 UJ	12 U	13 UJ	11 UJ
ACETONE	55 UJ	65 UJ	140 UJ	10 U	12 U	13 UJ	55 UJ
BENZENE	11 UJ	13 UJ	14 UJ	10 U	12 U	13 UJ	11 U
BROMODICHLOROMETHANE	11 UJ	13 UJ	14 UJ	10 U	12 U	13 UJ	11 U
BROMOFORM	11 UJ	13 UJ	14 UJ	10 U	12 U	13 UJ	11 U
BROMOMETHANE	11 UJ	13 U	14 UJ	10 U	12 U	13 UJ	11 U
CARBON DISULFIDE	11 UJ	13 U	14 UJ	10 U	12 U	13 UJ	11 U
CARBON TETRACHLORIDE	11 UJ	13 UJ	14 UJ	10 U	12 U	13 UJ	11 U
CHLOROBENZENE	11 UJ	**6** J	**2** J	10 U	12 U	13 UJ	11 U
CHLOROETHANE	11 UJ	13 UJ	14 UJ	10 U	12 U	13 UJ	11 UJ
CHLOROFORM	11 UJ	13 U	14 UJ	10 U	12 U	13 UJ	11 U
CHLOROMETHANE	11 UJ	13 U	14 UJ	10 U	12 U	13 UJ	11 U
CIS-1,3-DICHLOROPROPENE	11 UJ	13 UJ	14 UJ	10 U	12 U	13 UJ	11 U
DIBROMOCHLOROMETHANE	11 UJ	13 UJ	14 UJ	10 U	12 U	13 UJ	11 U
ETHYLBENZENE	11 UJ	**3** J	**71** J	10 U	12 U	13 UJ	11 U
METHYLENE CHLORIDE	11 UJ	65 UJ	68 UJ	10 U	12 U	13 UJ	11 UJ
STYRENE	11 UJ	13 UJ	14 UJ	10 U	12 U	13 UJ	11 U
TETRACHLOROETHENE	11 UJ	13 UJ	14 UJ	10 U	12 U	13 UJ	11 U
TOLUENE	11 UJ	**2** J	**4** J	10 U	12 U	13 UJ	**4** J
TRANS-1,3-DICHLOROPROPENE	11 UJ	13 UJ	14 UJ	10 U	12 U	13 UJ	11 UJ
TRICHLOROETHENE	11 UJ	13 UJ	14 UJ	10 U	12 U	13 UJ	11 U
VINYL CHLORIDE	11 UJ	13 U	14 UJ	10 U	12 U	13 UJ	11 U
XYLENE (TOTAL)	11 UJ	**31** J	**10** J	10 U	12 U	13 UJ	11 U

TABLE B-1 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SOIL, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB	SB	SB	SB	SB	SB
Point Name:	B1-6	B1-6	B1-7	B1-7	B1-8	B1-8	B1-8
Sample ID:	273-S01-065	273-S01-066	273-S01-067	273-S01-068	273-S01-070	273-S01-071	273-S01-072
Sample Date:	11-JAN-94	11-JAN-94	08-JAN-94	08-JAN-94	08-JAN-94	08-JAN-94	08-JAN-94
Screen Depth (feet bgs):	3.5 to 4.5	8.0 to 9.0	0.0 to 1.0	3.0 to 4.0	0.0 to 1.0	3.5 to 4.5	7.5 to 8.5
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
VOA (ug/kg)							
1,1,2-TRICHLOROETHANE	12 U	15 U	11 U	13 U	10 U	10 U	14 U
1,1-DICHLOROETHANE	12 U	15 U	11 U	13 U	10 U	10 U	14 U
1,1-DICHLOROETHENE	12 U	15 U	11 U	13 U	10 U	10 U	14 U
1,2-DICHLOROETHANE	12 U	15 U	11 U	13 U	10 U	10 U	14 U
1,2-DICHLOROETHENE (TOTAL)	12 U	15 U	11 U	13 U	10 U	10 U	14 U
1,2-DICHLOROPROPANE	12 U	15 U	11 U	13 U	10 U	10 U	14 U
2-BUTANONE	12 U	75 UJ	11 U	13 UJ	10 UJ	10 UJ	14 UJ
2-HEXANONE	12 U	15 UJ	11 U	13 UJ	10 UJ	10 UJ	14 UJ
4-METHYL-2-PENTANONE	12 UJ	15 UJ	11 U	13 UJ	10 UJ	10 UJ	14 UJ
ACETONE	60 UJ	150 UJ	11 U	13 UJ	10 UJ	50 UJ	14 UJ
BENZENE	12 U	15 U	11 U	13 U	10 U	10 U	14 U
BROMODICHLOROMETHANE	12 U	15 U	11 U	13 U	10 U	10 U	14 U
BROMOFORM	12 U	15 U	11 U	13 U	10 U	10 U	14 U
BROMOMETHANE	12 U	15 U	11 U	13 U	10 U	10 U	14 U
CARBON DISULFIDE	12 U	**8** J	11 U	13 U	10 U	10 U	14 U
CARBON TETRACHLORIDE	12 U	15 U	11 U	13 U	10 U	10 U	14 U
CHLOROBENZENE	12 U	15 UJ	11 U	13 U	10 U	10 U	14 U
CHLOROETHANE	12 U	15 UJ	11 U	13 U	10 U	10 U	14 U
CHLOROFORM	12 U	15 U	11 U	13 U	10 U	10 U	14 U
CHLOROMETHANE	12 U	15 U	11 UJ	13 UJ	10 UJ	10 UJ	14 UJ
CIS-1,3-DICHLOROPROPENE	12 U	15 U	11 U	13 U	10 U	10 U	14 U
DIBROMOCHLOROMETHANE	12 U	15 U	11 U	13 U	10 U	10 U	14 U
ETHYLBENZENE	12 U	15 UJ	11 U	13 U	10 U	10 U	14 U
METHYLENE CHLORIDE	12 U	15 U	55 UJ	65 UJ	50 UJ	50 UJ	14 UJ
STYRENE	12 U	15 UJ	11 U	13 U	10 U	10 U	14 U
TETRACHLOROETHENE	12 U	15 UJ	11 U	13 U	10 U	10 U	14 U
TOLUENE	12 U	**9** J	11 U	13 U	10 U	10 U	14 U
TRANS-1,3-DICHLOROPROPENE	12 U	15 UJ	11 U	13 U	10 U	10 U	14 U
TRICHLOROETHENE	12 U	15 U	11 U	13 U	10 U	10 U	14 U
VINYL CHLORIDE	12 U	15 U	11 U	13 U	10 U	10 U	14 U
XYLENE (TOTAL)	12 U	**11** J	11 U	13 U	10 U	10 U	14 U

TABLE B-1 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SOIL, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB	SB	SB	SB	SB	SB
Point Name:	MW1-5R	MW1-5R	MW1-8	MW1-8	MW1-8	MW1-8	MW1-9
Sample ID:	273-S01-121	273-S01-122	273-S01-073	273-S01-074	273-S01-123	273-S01-075	273-S01-076
Sample Date:	11-JAN-94	11-JAN-94	15-JAN-94	15-JAN-94	15-JAN-94	15-JAN-94	15-JAN-94
Screen Depth (feet bgs):	0.5 to 1.5	5.0 to 6.0	0.5 to 1.5	3.5 to 4.5	6.5 to 7.5	8.0 to 9.0	0.5 to 1.5
ECO Habitat:	UPLAND	UPLAND	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
VOA (ug/kg)							
1,1,2-TRICHLOROETHANE	11 UJ	11 U	10 U	10 U	11 U	15 U	12 U
1,1-DICHLOROETHANE	11 U	11 U	10 U	10 U	11 U	15 U	12 U
1,1-DICHLOROETHENE	11 U	11 U	10 U	10 U	11 U	15 U	12 U
1,2-DICHLOROETHANE	11 U	11 U	10 U	10 U	11 U	15 U	12 U
1,2-DICHLOROETHENE (TOTAL)	11 U	11 U	10 U	10 U	11 U	15 U	12 U
1,2-DICHLOROPROPANE	11 U	11 U	10 U	10 U	11 U	15 U	12 U
2-BUTANONE	11 U	11 UJ	10 U	10 U	11 UJ	15 U	12 U
2-HEXANONE	11 UJ	11 UJ	10 UJ	10 UJ	11 UJ	15 UJ	12 UJ
4-METHYL-2-PENTANONE	11 UJ	11 UJ	10 UJ	10 UJ	11 UJ	15 UJ	12 UJ
ACETONE	55 UJ	55 UJ	10 U	10 U	11 U	15 U	12 U
BENZENE	11 UJ	11 U	10 U	10 U	11 U	15 U	12 U
BROMODICHLOROMETHANE	11 UJ	11 U	10 U	10 U	11 U	15 U	12 U
BROMOFORM	11 UJ	11 U	10 U	10 U	11 U	15 U	12 U
BROMOMETHANE	11 U	11 U	10 U	10 U	11 U	15 U	12 U
CARBON DISULFIDE	11 U	11 U	10 U	10 U	11 U	15 U	12 U
CARBON TETRACHLORIDE	11 UJ	11 U	10 U	10 U	11 U	15 U	12 U
CHLOROBENZENE	11 UJ	11 U	10 U	10 U	11 U	15 U	12 U
CHLOROETHANE	11 UJ	11 UJ	10 U	10 U	11 U	15 U	12 U
CHLOROFORM	11 U	11 U	10 U	10 U	11 U	15 U	12 U
CHLOROMETHANE	11 U	11 U	10 UJ	10 UJ	11 U	15 UJ	12 UJ
CIS-1,3-DICHLOROPROPENE	11 UJ	11 U	10 U	10 U	11 U	15 U	12 U
DIBROMOCHLOROMETHANE	11 UJ	11 U	10 U	10 U	11 U	15 U	12 U
ETHYLBENZENE	11 UJ	11 U	10 U	10 U	11 U	15 U	12 U
METHYLENE CHLORIDE	11 U	11 UJ	10 UJ	10 UJ	11 UJ	15 UJ	60 UJ
STYRENE	11 UJ	11 U	10 U	10 U	11 U	15 U	12 U
TETRACHLOROETHENE	11 UJ	11 U	10 U	10 U	11 U	15 U	12 U
TOLUENE	11 UJ	11 U	10 U	10 U	11 U	15 U	12 U
TRANS-1,3-DICHLOROPROPENE	11 UJ	11 UJ	10 U	10 U	11 U	15 U	12 U
TRICHLOROETHENE	11 UJ	11 U	10 U	10 U	11 U	15 U	12 U
VINYL CHLORIDE	11 U	11 U	10 UJ	10 UJ	11 U	15 UJ	12 UJ
XYLENE (TOTAL)	11 UJ	11 U	10 U	10 U	11 U	15 U	12 U

TABLE B-1 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SOIL, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB
Point Name:	MW1-9	MW1-9
Sample ID:	273-S01-077	273-S01-078
Sample Date:	15-JAN-94	15-JAN-94
Screen Depth (feet bgs):	3.5 to 4.5	5.0 to 6.0
ECO Habitat:	TIDAL MARSH	TIDAL MARSH
VOA (ug/kg)		
1,1,2-TRICHLOROETHANE	14 U	14 U
1,1-DICHLOROETHANE	14 U	14 U
1,1-DICHLOROETHENE	14 U	14 U
1,2-DICHLOROETHANE	14 U	14 U
1,2-DICHLOROETHENE (TOTAL)	14 U	14 U
1,2-DICHLOROPROPANE	14 U	14 U
2-BUTANONE	14 U	14 U
2-HEXANONE	14 UJ	14 UJ
4-METHYL-2-PENTANONE	14 UJ	14 UJ
ACETONE	14 U	14 U
BENZENE	14 U	14 U
BROMODICHLOROMETHANE	14 U	14 U
BROMOFORM	14 U	14 U
BROMOMETHANE	14 U	14 U
CARBON DISULFIDE	14 U	14 U
CARBON TETRACHLORIDE	14 U	14 U
CHLOROBENZENE	14 U	14 U
CHLOROETHANE	14 U	14 U
CHLOROFORM	14 U	14 U
CHLOROMETHANE	14 UJ	14 UJ
CIS-1,3-DICHLOROPROPENE	14 U	14 U
DIBROMOCHLOROMETHANE	14 U	14 U
ETHYLBENZENE	14 U	14 U
METHYLENE CHLORIDE	70 UJ	70 UJ
STYRENE	14 U	14 U
TETRACHLOROETHENE	14 U	14 U
TOLUENE	14 U	14 U
TRANS-1,3-DICHLOROPROPENE	14 U	14 U
TRICHLOROETHENE	14 U	14 U
VINYL CHLORIDE	14 UJ	14 UJ
XYLENE (TOTAL)	14 U	14 U

TABLE B-1 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SOIL, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Notes and Abbreviations:
- Detections appear in boldface type
- bgs - Below ground surface
- J - Estimated concentration
- mg/kg - Milligrams per kilogram
- NA - Not analyzed
- SB - Soil boring
- U - Not detected
- ug/kg - Micrograms per kilogram

TABLE B-2

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SOIL, INORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB	SB	SB	SB	SB	SB
Point Name:	B1-1	B1-1	B1-2	B1-2	B1-3	B1-3	B1-3
Sample ID:	273-S01-049	273-S01-050	273-S01-052	273-S01-053	273-S01-055	273-S01-056	273-S01-057
Sample Date:	08-JAN-94	08-JAN-94	11-JAN-94	11-JAN-94	18-JAN-94	18-JAN-94	18-JAN-94
Screen Depth (feet bgs):	0.0 to 1.0	2.5 to 3.5	0.5 to 1.5	3.5 to 4.5	0.0 to 1.0	3.0 to 4.0	6.0 to 6.5
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	UPLAND	UPLAND	UPLAND
TMETAL (mg/kg)							
ALUMINUM	**7,460**	**25,100**	**2,460**	**5,970**	**7,560**	**8,450**	**10,800**
ANTIMONY	N/A	N/A	0.25 UJ	0.32 UJ	3.9 UJ	4.1 UJ	5.7 UJ
ARSENIC	1.2 UJ	2.1 UJ	**1.7** J	**3.7**	**3.3**	**4.1**	**5.4**
BARIUM	**39.1** J	**66.5** J	**26.4** J	**54.5**	**101**	**97.8**	**210**
BERYLLIUM	**0.86** J	**3.1**	0.25 UJ	0.48 UJ	0.29 UJ	0.41 UJ	0.34 UJ
CADMIUM	0.58 U	0.83 U	0.63 UJ	0.88 UJ	**3**	**1.9**	**2.4**
CALCIUM	**1,830**	**4,430**	**5,940**	**6,770**	**12,100**	**8,970**	**11,100**
CHROMIUM	**13.6**	**45.9**	5.3 UJ	**12**	**21.8**	**24.8**	**38.9**
COBALT	**3.6** J	**12.6** J	2.6 UJ	4.2 UJ	**5.8** J	**6.4** J	**10.6** J
COPPER	**8.1**	**21.5**	3.7 UJ	7.9 UJ	**167**	**316**	**154**
IRON	**11,000**	**32,900**	**5,480**	**10,300**	**20,100**	**24,100**	**47,500**
LEAD	**3.1**	**11.5**	**1.7** J	**18.1** J	**139**	**302**	**328**
MAGNESIUM	**3,100**	**12,400**	**1,660**	**3,590**	**5,240**	**4,230**	**5,450**
MANGANESE	**155** J	**267** J	**73.9**	**122**	**272**	**245**	**417**
MERCURY	0.16 U	0.22 U	0.05 U	0.06 U	0.36 UJ	0.33 UJ	**0.66**
MOLYBDENUM	1.4 U	2 U	0.74 U	0.9 U	4.1 UJ	**7.3**	**8.2**
NICKEL	**9.4**	**29.5**	6.4 UJ	11.6 UJ	**25.3**	**44.1**	**36**
POTASSIUM	2,220 UJ	**9,620**	**768** J	**2,170**	**1,750**	**2,320**	**2,500**
SELENIUM	0.42 U	0.57 U	0.29 UJ	0.35 UJ	0.3 UJ	0.31 UJ	0.49 UJ
SILVER	1.1 U	1.5 U	0.55 UJ	0.67 UJ	**6.7** J	0.6 UJ	**102** J
SODIUM	374 UJ	**5,170**	184 UJ	**4,740**	**337** J	**726** J	**940** J
THALLIUM	0.42 U	0.57 U	0.27 U	0.32 U	0.19 U	0.2 U	0.31 U
VANADIUM	**26.3**	**83.5**	**11**	**25.3**	**31.6**	**30.2**	**32.4**
ZINC	**25.8** J	**104** J	13.8 UJ	33.8 UJ	**326**	**469**	**5,140**

TABLE B-2 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SOIL, INORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB	SB	SB	SB	SB	SB
Point Name:	B1-4	B1-4	B1-4	B1-5	B1-5	B1-5	B1-6
Sample ID:	273-S01-058	273-S01-059	273-S01-060	273-S01-061	273-S01-062	273-S01-063	273-S01-064
Sample Date:	18-JAN-94	19-JAN-94	19-JAN-94	11-JAN-94	11-JAN-94	11-JAN-94	11-JAN-94
Screen Depth (feet bgs):	0.0 to 1.5	3.0 to 4.0	5.0 to 5.5	0.5 to 1.5	3.5 to 4.5	4.5 to 6.0	0.5 to 1.5
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
TMETAL (mg/kg)							
ALUMINUM	**27,100**	**10,100**	**9,190**	**5,890**	**2,460**	**10,700**	**5,790**
ANTIMONY	0.32 UJ	1.5 UJ	1.3 UJ	1.8 UJ	0.75 UJ	0.42 UJ	2 UJ
ARSENIC	**5.6**	**4.1**	**3.4**	**2.6**	**1.9** J	**5.3**	**3.8**
BARIUM	**182**	**173**	**62.3**	**58.8**	**33.3** J	**120**	**91.3**
BERYLLIUM	**1.1** J	0.45 UJ	0.34 UJ	0.4 UJ	0.17 UJ	0.6 UJ	0.38 UJ
CADMIUM	**0.69** J	**1.8**	**4.9**	1.3 UJ	0.31 U	0.77 UJ	**11**
CALCIUM	**15,800**	**29,800**	**12,800**	**4,510**	**4,830**	**8,760**	**9,120**
CHROMIUM	**51.3**	**30.2**	**38.2**	**13.3**	5.4 UJ	**17.5** J	**37.7** J
COBALT	**16.4**	**7.8** J	**5.4** J	5.2 UJ	2.1 UJ	7.5 UJ	**11.6** J
COPPER	**70.7**	**65.9**	**50**	**31.9**	5.1 UJ	13.9 UJ	**427** J
IRON	**42,600**	**22,500**	**19,400**	**12,200**	**5,340**	**19,400**	**148,000**
LEAD	**136**	**87**	**146**	**21.1** J	**3.7** J	**6.8** J	**84** J
MAGNESIUM	**14,800**	**4,570**	**3,780**	**3,440**	**1,730**	**6,330**	**3,310**
MANGANESE	**479**	**262**	**337**	**150**	**75.1**	**323**	**711**
MERCURY	0.2 UJ	0.32 UJ	0.43 UJ	0.05 U	0.06 U	0.07 U	**0.5**
MOLYBDENUM	3.4 UJ	**10**	3 UJ	0.91 UJ	0.86 U	2.1 UJ	**15.7**
NICKEL	**46.5**	**20.2**	**14.5**	13 UJ	6.6 UJ	16.7 UJ	**86.4**
POTASSIUM	**9,820**	**2,610**	**2,160**	**1,740**	**851** J	**3,680**	**1,550**
SELENIUM	1.6 UJ	0.36 UJ	0.39 UJ	0.29 UJ	0.31 UJ	**0.39** J	0.32 UJ
SILVER	0.62 UJ	**25** J	0.74 UJ	2.4 UJ	0.65 UJ	0.71 U	3.1 U
SODIUM	**1,860**	**850** J	**740** J	**262** J	**1,850**	**3,840**	**512** J
THALLIUM	**0.38** J	**0.24** J	**0.25** J	0.27 U	0.31 U	0.34 U	0.3 UJ
VANADIUM	**90.5**	**36.8**	**26**	**23.8**	**9.5** J	**39.4**	**34.7** J
ZINC	**262**	**285**	**376**	**90.6**	17.1 UJ	**47.7** J	**708** J

TABLE B-2 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SOIL, INORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB	SB	SB	SB	SB	SB
Point Name:	B1-6	B1-6	B1-7	B1-7	B1-8	B1-8	B1-8
Sample ID:	273-S01-065	273-S01-066	273-S01-067	273-S01-068	273-S01-070	273-S01-071	273-S01-072
Sample Date:	11-JAN-94	11-JAN-94	08-JAN-94	08-JAN-94	08-JAN-94	08-JAN-94	08-JAN-94
Screen Depth (feet bgs):	3.5 to 4.5	8.0 to 9.0	0.0 to 1.0	3.0 to 4.0	0.0 to 1.0	3.5 to 4.5	7.5 to 8.5
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
TMETAL (mg/kg)							
ALUMINUM	**6,350**	**11,500**	**6,860**	**5,990**	**3,790**	**2,690**	**20,700**
ANTIMONY	3.5 UJ	8.2 UJ	N/A	N/A	N/A	N/A	N/A
ARSENIC	**2** J	**8.9**	1.6 UJ	1.7 UJ	1.6 UJ	1.4 UJ	**6.4** J
BARIUM	**65**	**127**	**56.4** J	**48** J	**23.1** J	**26.4** J	**131** J
BERYLLIUM	0.43 UJ	0.59 UJ	**1** J	**0.88** J	**0.59** J	**0.5** J	**3.4**
CADMIUM	3.2 UJ	**9.6**	**0.61** J	0.72 U	0.58 U	0.58 U	0.78 U
CALCIUM	**14,000**	**13,100**	**7,900**	**7,350**	**5,460**	**3,980**	**3,700**
CHROMIUM	**16.2** J	**447** J	**14.3**	**13.2**	**8.4**	**6.4**	**37.1**
COBALT	5.2 UJ	12.3 UJ	**3.9** J	**4.2** J	**2.7** J	**2.6** J	**12.4** J
COPPER	**666** J	**205** J	**22.1**	**7.3**	4.5 UJ	4.7 UJ	**28.4**
IRON	**12,500**	**37,300**	**11,500**	**9,550**	**6,550**	**4,710**	**35,200**
LEAD	**146** J	**204** J	**28.6** J	**4.1**	**4.6**	**1.7**	**14.2**
MAGNESIUM	**4,270**	**7,820**	**3,330**	**2,860**	**1,750**	**1,470**	**9,380**
MANGANESE	**184**	**311**	**150** J	**125** J	**136** J	**62.2** J	**370** J
MERCURY	**0.12**	**4**	0.16 U	0.19 U	0.15 U	0.16 U	0.2 U
MOLYBDENUM	1.8 UJ	6.1 UJ	1.4 U	1.7 U	1.4 U	1.4 U	**6.7** J
NICKEL	13.5 UJ	**142**	**10.9**	**11.7**	**5.8** J	**4.7** J	**25.2**
POTASSIUM	**1,210**	**3,200**	1,810 UJ	1,800 UJ	1,210 UJ	901 UJ	**6,940**
SELENIUM	0.33 UJ	0.43 UJ	0.43 U	0.5 U	0.4 U	0.41 U	1.1 UJ
SILVER	1.1 UJ	1.4 UJ	1.1 U	1.3 U	1.1 U	1.1 U	1.4 U
SODIUM	**950** J	**2,240**	175 UJ	252 UJ	113 UJ	159 UJ	**2,760**
THALLIUM	0.31 U	0.4 UJ	0.43 UJ	0.5 U	0.4 U	0.41 U	0.53 U
VANADIUM	**24.4**	**38.5**	**23.7**	**22.5**	**15.5**	10.5 UJ	**69.3**
ZINC	**206** J	**2,900** J	**64.3** J	**29.2** J	**18.9** J	**14.6** J	**84.8** J

TABLE B-2 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SOIL, INORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB	SB	SB	SB	SB	SB
Point Name:	MW1-5R	MW1-5R	MW1-8	MW1-8	MW1-8	MW1-8	MW1-9
Sample ID:	273-S01-121	273-S01-122	273-S01-073	273-S01-074	273-S01-123	273-S01-075	273-S01-076
Sample Date:	11-JAN-94	11-JAN-94	15-JAN-94	15-JAN-94	15-JAN-94	15-JAN-94	15-JAN-94
Screen Depth (feet bgs):	0.5 to 1.5	5.0 to 6.0	0.5 to 1.5	3.5 to 4.5	6.5 to 7.5	8.0 to 9.0	0.5 to 1.5
ECO Habitat:	UPLAND	UPLAND	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
TMETAL (mg/kg)							
ALUMINUM	**11,400**	**5,770**	**1,820**	**1,630**	**1,610**	**26,100**	**7,510**
ANTIMONY	1.1 UJ	1.8 UJ	0.4 UJ	0.4 UJ	0.42 UJ	0.61 UJ	0.47 UJ
ARSENIC	**4.7**	**10.3**	**0.78** J	**1.1** J	**1.2** J	**6.2**	**3.1**
BARIUM	**132**	**72**	**22.4** J	**17.4** J	**15.7** J	**157**	**72.1**
BERYLLIUM	0.59 UJ	0.48 UJ	**0.57** J	**0.37** J	**0.65** J	**5**	**1.9**
CADMIUM	3.8 UJ	**6.5**	0.58 U	0.59 U	0.61 U	**2.2**	0.68 U
CALCIUM	**15,900**	**21,400**	**3,290**	**3,510**	**3,450**	**7,210**	**8,640**
CHROMIUM	**31.3** J	**25.2** J	4.3 UJ	4 UJ	3.6 UJ	**59.7**	**16.5**
COBALT	8.3 UJ	5.2 UJ	**1.3** J	**1.4** J	**1.6** J	**13.8** J	**6.2** J
COPPER	**95.8** J	**57.5** J	1.9 UJ	**4.7** J	2.9 UJ	**39.8**	**12.2**
IRON	**26,700**	**14,600**	**4,180**	**3,850**	**4,030**	**36,100**	**13,900**
LEAD	**595** J	**126** J	**1.3**	**1.7**	0.96 UJ	**12.5**	**8.6**
MAGNESIUM	**6,030**	**2,600**	**1,090**	**1,030**	**1,070**	**12,200**	**4,580**
MANGANESE	**265**	**147**	**53.4**	**52.6**	**56.8**	**406**	**208**
MERCURY	**0.16**	**0.13**	0.15 U	0.15 U	0.16 U	0.23 U	0.18 U
MOLYBDENUM	2.6 UJ	1.9 UJ	1.4 U	1.4 U	1.4 U	2.1 U	1.6 U
NICKEL	22.6 UJ	19.1 UJ	3.5 UJ	3.8 UJ	3.9 UJ	**51.9**	**17.2**
POTASSIUM	**3,540**	**1,110** J	325 UJ	222 UJ	229 UJ	**8,000**	**2,400**
SELENIUM	**0.87** J	1.6 UJ	0.4 U	0.4 U	0.42 U	**0.95** J	0.48 U
SILVER	2.9 UJ	2.9 UJ	1.1 U	1.1 U	1.1 U	1.6 U	1.2 U
SODIUM	**1,590**	**561** J	110 UJ	96.5 UJ	115 UJ	**4,540**	**2,600**
THALLIUM	0.29 U	0.29 U	0.4 U	0.4 U	0.42 U	0.59 U	0.48 U
VANADIUM	**40.7**	19.3 UJ	7.9 UJ	6.3 UJ	7 UJ	**94.9**	**34**
ZINC	**277** J	**238** J	10.3 UJ	12.3 UJ	10.2 UJ	112 UJ	42.2 UJ

TABLE B-2 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SOIL, INORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB
Point Name:	MW1-9	MW1-9
Sample ID:	273-S01-077	273-S01-078
Sample Date:	15-JAN-94	15-JAN-94
Screen Depth (feet bgs):	3.5 to 4.5	5.0 to 6.0
ECO Habitat:	TIDAL MARSH	TIDAL MARSH
TMETAL (mg/kg)		
ALUMINUM	**23,500**	**18,800**
ANTIMONY	0.56 UJ	0.57 UJ
ARSENIC	**11.6**	**4.2**
BARIUM	**307**	**117**
BERYLLIUM	**5.9**	**4.7**
CADMIUM	0.81 U	0.82 U
CALCIUM	**4,470**	**4,380**
CHROMIUM	**43.3**	**40.6**
COBALT	**16.3**	**13.3** J
COPPER	**33.2**	**29.6**
IRON	**42,000**	**34,400**
LEAD	**14**	**8.9**
MAGNESIUM	**12,800**	**11,700**
MANGANESE	**532**	**298**
MERCURY	0.22 U	0.21 U
MOLYBDENUM	3.3 UJ	2.7 UJ
NICKEL	**39.1**	**39.7**
POTASSIUM	**7,240**	**7,550**
SELENIUM	**0.99** J	**0.83** J
SILVER	1.5 U	1.5 U
SODIUM	**5,640**	**4,300**
THALLIUM	0.57 U	0.55 U
VANADIUM	**83.1**	**75.1**
ZINC	107 UJ	107 UJ

TABLE B-2 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SOIL, INORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Notes and Abbreviations:
- Detections appear in boldface type
- bgs - Below ground surface
- J - Estimated concentration
- mg/kg - Milligrams per kilogram
- NA - Not analyzed
- SB - Soil boring
- U - Not detected

TABLE B-3

REMEDIAL INVESTIGATION ADDENDUM, ANALYTICAL RESULTS IN SOIL, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB	SB	SB	SB	SB	SB
Point Name:	MW1-10	MW1-10	MW1-11A	MW1-11A	MW1-12	MW1-12	MW1-12
Sample ID:	149-S01-001	149-S01-002	149-S01-003	149-S01-004	149-S01-005	149-S01-006	149-S01-006A
Sample Date:	30-APR-98	30-APR-98	30-APR-98	30-APR-98	01-MAY-98	01-MAY-98	01-MAY-98
Screen Depth (feet bgs):	0.0 to 0.5	6.5 to 7.0	0.5 to 1.0	5.5 to 6.5	1.0 to 1.5	3.0 to 3.5	4.0 to 4.5
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
DIOXIN (ug/kg)							
1234678-HEPTACHLORINATED DIBENZO-P-DIOXI	**0.4**	0.05 UJ	0.03 UJ	0.04 UJ	0.05 UJ	0.02 UJ	0.03 UJ
1234678-HEPTACHLORINATED DIBENZOFURAN	**0.3** J	**0.04** J	**0.02** J	**0.03** J	0.02 UJ	**0.03** J	**0.04** J
123478-HEXACHLORINATED DIBENZO-P-DIOXIN	0.3 UJ	0.3 UJ	0.3 UJ	0.4 UJ	0.3 UJ	0.4 UJ	0.6 UJ
123478-HEXACHLORINATED DIBENZOFURAN	0.3 UJ	0.3 UJ	0.3 UJ	0.4 UJ	**0.007** J	0.4 UJ	0.6 UJ
1234789-HEPTACHLORINATED DIBENZOFURAN	0.3 UJ	0.3 UJ	0.3 UJ	0.4 UJ	**0.03** J	0.4 UJ	0.6 UJ
123678-HEXACHLORINATED DIBENZO-P-DIOXIN	**0.2** J	**0.03**	**0.02** J	**0.02** J	**0.02** J	**0.01** J	**0.02** J
123678-HEXACHLORINATED DIBENZOFURAN	**0.1** J	0.02 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.009 UJ	0.02 UJ
12378-PENTACHLORINATED DIBENZO-P-DIOXIN	0.1 U	0.1 U	0.1 U	**0.01** J	0.1 U	0.2 U	**0.01** J
12378-PENTACHLORINATED DIBENZOFURAN	0.006 UJ	0.02 UJ	0.007 UJ	0.01 UJ	0.01 UJ	0.02 UJ	0.03 UJ
123789-HEXACHLORINATED DIBENZO-P-DIOXIN	0.3 UJ	0.3 UJ	0.3 UJ	0.4 UJ	0.3 UJ	0.4 UJ	0.6 UJ
123789-HEXACHLORINATED DIBENZOFURAN	0.007 UJ	0.3 UJ	0.3 UJ	0.4 UJ	0.3 UJ	0.006 UJ	0.01 UJ
234678-HEXACHLORINATED DIBENZOFURAN	0.3 UJ	0.3 UJ	0.3 UJ	0.4 UJ	0.3 UJ	0.4 UJ	**0.01** J
23478-PENTACHLORINATED DIBENZOFURAN	0.1 UJ	0.1 UJ	0.1 UJ	0.2 UJ	0.1 UJ	0.2 UJ	0.2 UJ
2378-TETRACHLORINATED DIBENZO-P-DIOXIN	**0.03**	0.01 UJ	0.1 U	0.2 U	0.1 U	0.01 UJ	0.02 UJ
2378-TETRACHLORINATED DIBENZOFURAN	0.02 UJ	0.01 UJ	0.008 UJ	0.008 UJ	0.01 UJ	0.01 UJ	0.01 UJ
HEPTACHLORINATED DIBENZO-P-DIOXIN	**0.4**	0.05 U	0.03 U	0.04 U	**0.1**	**0.02**	0.03 U
HEPTACHLORINATED DIBENZOFURAN	**0.3**	0.04 U	**0.01**	0.03 U	**0.02**	0.03 U	**0.02**
HEXACHLORINATED DIBENZO-P-DIOXIN	**0.2**	0.004 U	0.003 U	0.01 U	0.01 U	0.01 U	**0.02**
HEXACHLORINATED DIBENZOFURAN	0.2 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	**0.8**
OCTACHLORINATED DIBENZO-P-DIOXIN	**0.9**	0.09 UJ	0.05 UJ	0.05 UJ	**0.3** J	0.8 U	0.07 UJ
OCTACHLORINATED DIBENZOFURAN	**0.9**	0.06 UJ	0.03 UJ	0.03 UJ	0.03 UJ	0.04 UJ	0.03 UJ
PENTACHLORINATED DIBENZO-P-DIOXIN	0.01 U	0.008 U	0.008 U	**0.01**	0.008 U	0.01 U	0.01 U
PENTACHLORINATED DIBENZOFURAN	**0.04**	0.02 UJ	0.007 U	0.03 UJ	0.03 UJ	0.02 U	0.03 U
TETRACHLORINATED DIBENZO-P-DIOXIN	0.03 U	0.01 U	0.02 U	0.01 U	0.02 U	0.01 U	0.02 U
TETRACHLORINATED DIBENZOFURAN	**0.04**	0.01 U	**0.008**	0.008 U	**0.01**	**0.01**	0.01 U
PEST (ug/kg)							
4,4'-DDD	3 U	5 U	3 U	5 U	**11** J	**8** J	5 U
4,4'-DDE	3 U	5 U	3 U	5 U	**21**	**17**	5 U
4,4'-DDT	3 U	5 U	3 U	5 U	**37**	**27**	5 U
ALDRIN	2 U	2 U	2 U	2 U	2 U	2 U	3 U
ALPHA-BHC	2 U	2 U	2 U	2 U	2 U	2 U	3 U
ALPHA-CHLORDANE	2 U	2 U	2 U	2 U	2 U	2 U	3 U
AROCLOR-1016	16 U	23 U	16 U	22 U	18 U	20 U	26 U
AROCLOR-1221	16 U	23 U	16 U	22 U	18 U	20 U	26 U
AROCLOR-1232	16 U	23 U	16 U	22 U	18 U	20 U	26 U
AROCLOR-1242	16 U	23 U	16 U	22 U	18 U	20 U	26 U
AROCLOR-1248	16 U	23 U	16 U	22 U	18 U	20 U	26 U

TABLE B-3 (Continued)

REMEDIAL INVESTIGATION ADDENDUM, ANALYTICAL RESULTS IN SOIL, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB
Point Name:	MW1-13	MW1-13
Sample ID:	149-S01-007	149-S01-008
Sample Date:	30-APR-98	30-APR-98
Screen Depth (feet bgs):	1.0 to 1.5	8.5 to 9.0
ECO Habitat:	UPLAND	UPLAND
DIOXIN (ug/kg)		
1234678-HEPTACHLORINATED DIBENZO-P-DIOXI	**0.4**	**0.2** J
1234678-HEPTACHLORINATED DIBENZOFURAN	0.1 UJ	**0.1** J
123478-HEXACHLORINATED DIBENZO-P-DIOXIN	0.4 UJ	**0.04** J
123478-HEXACHLORINATED DIBENZOFURAN	**0.02** J	**0.03** J
1234789-HEPTACHLORINATED DIBENZOFURAN	**0.01** J	**0.2** J
123678-HEXACHLORINATED DIBENZO-P-DIOXIN	**0.05** J	**0.06** J
123678-HEXACHLORINATED DIBENZOFURAN	0.03 UJ	0.05 UJ
12378-PENTACHLORINATED DIBENZO-P-DIOXIN	0.1 U	0.1 U
12378-PENTACHLORINATED DIBENZOFURAN	0.1 U	0.1 U
123789-HEXACHLORINATED DIBENZO-P-DIOXIN	0.4 UJ	**0.05** J
123789-HEXACHLORINATED DIBENZOFURAN	0.4 UJ	**2** J
234678-HEXACHLORINATED DIBENZOFURAN	0.4 UJ	**0.1** J
23478-PENTACHLORINATED DIBENZOFURAN	0.1 UJ	0.1 UJ
2378-TETRACHLORINATED DIBENZO-P-DIOXIN	0.1 U	0.1 U
2378-TETRACHLORINATED DIBENZOFURAN	0.1 U	0.1 U
HEPTACHLORINATED DIBENZO-P-DIOXIN	**0.9**	**0.3**
HEPTACHLORINATED DIBENZOFURAN	**0.3**	**0.4**
HEXACHLORINATED DIBENZO-P-DIOXIN	**0.09**	**0.2**
HEXACHLORINATED DIBENZOFURAN	0.2 UJ	0.3 UJ
OCTACHLORINATED DIBENZO-P-DIOXIN	**2**	**1**
OCTACHLORINATED DIBENZOFURAN	0.1 UJ	**0.3** J
PENTACHLORINATED DIBENZO-P-DIOXIN	0.04 U	0.03 U
PENTACHLORINATED DIBENZOFURAN	0.07 UJ	0.02 U
TETRACHLORINATED DIBENZO-P-DIOXIN	0.04 U	0.02 U
TETRACHLORINATED DIBENZOFURAN	0.009 U	0.02 U
PEST (ug/kg)		
4,4'-DDD	4 U	**23**
4,4'-DDE	4 U	**150**
4,4'-DDT	4 U	20 U
ALDRIN	2 U	10 U
ALPHA-BHC	2 U	10 U
ALPHA-CHLORDANE	2 U	10 U
AROCLOR-1016	18 U	97 U
AROCLOR-1221	18 U	97 U
AROCLOR-1232	18 U	97 U
AROCLOR-1242	18 U	97 U
AROCLOR-1248	18 U	97 U

TABLE B-3 (Continued)

REMEDIAL INVESTIGATION ADDENDUM, ANALYTICAL RESULTS IN SOIL, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB	SB	SB	SB	SB	SB
Point Name:	MW1-10	MW1-10	MW1-11A	MW1-11A	MW1-12	MW1-12	MW1-12
Sample ID:	149-S01-001	149-S01-002	149-S01-003	149-S01-004	149-S01-005	149-S01-006	149-S01-006A
Sample Date:	30-APR-98	30-APR-98	30-APR-98	30-APR-98	01-MAY-98	01-MAY-98	01-MAY-98
Screen Depth (feet bgs):	0.0 to 0.5	6.5 to 7.0	0.5 to 1.0	5.5 to 6.5	1.0 to 1.5	3.0 to 3.5	4.0 to 4.5
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
PEST (ug/kg)							
AROCLOR-1254	16 U	23 U	16 U	22 U	18 U	20 U	26 U
AROCLOR-1260	16 U	23 U	16 U	22 U	**46** J	**70**	26 U
BETA-BHC	2 U	2 U	2 U	2 U	2 U	2 U	3 U
DELTA-BHC	2 U	2 U	2 U	2 U	2 U	2 U	3 U
DIELDRIN	3 U	5 U	3 U	5 U	**2** J	4 U	5 U
ENDOSULFAN I	2 U	2 U	2 U	2 U	2 U	2 U	3 U
ENDOSULFAN II	3 U	5 U	3 U	5 U	4 U	4 U	5 U
ENDOSULFAN SULFATE	3 U	5 U	3 U	5 U	4 U	4 U	5 U
ENDRIN	3 U	5 U	3 U	5 U	**2** J	**2** J	5 U
ENDRIN ALDEHYDE	3 U	5 U	3 U	5 U	**2** J	4 U	5 U
ENDRIN KETONE	3 U	5 U	3 U	5 U	**2** J	**3** J	5 U
GAMMA-BHC (LINDANE)	2 U	2 U	2 U	2 U	2 U	2 U	3 U
GAMMA-CHLORDANE	2 U	2 U	2 U	2 U	**3** J	**2** J	3 U
HEPTACHLOR	0.3 U	0.4 U	0.3 U	0.4 U	0.3 U	0.4 U	**1** J
HEPTACHLOR EPOXIDE	0.3 U	0.4 U	0.3 U	0.4 U	0.3 U	0.4 U	0.5 U
METHOXYCHLOR	17 U	24 U	17 U	23 U	19 U	21 U	28 U
TOXAPHENE	87 U	120 U	87 U	110 U	95 U	110 U	140 U
SVOA (ug/kg)							
1,2,4-TRICHLOROBENZENE	340 U	470 U	340 U	450 U	370 U	410 U	540 U
1,2-DICHLOROBENZENE	160 U	230 U	160 U	220 U	180 U	200 U	260 U
1,3-DICHLOROBENZENE	160 U	230 U	160 U	220 U	180 U	200 U	260 U
1,4-DICHLOROBENZENE	160 U	230 U	160 U	220 U	180 U	200 U	260 U
2,2'-OXYBIS(1-CHLOROPROPANE)	340 U	470 U	340 U	450 U	370 U	410 U	540 U
2,4,5-TRICHLOROPHENOL	850 U	1,200 U	850 U	1,100 U	930 U	1,000 U	1,400 U
2,4,6-TRICHLOROPHENOL	340 U	470 U	340 U	450 U	370 U	410 U	540 U
2,4-DICHLOROPHENOL	340 U	470 U	340 U	450 U	370 U	410 U	540 U
2,4-DIMETHYLPHENOL	340 U	470 U	340 U	450 U	370 U	410 U	540 U
2,4-DINITROPHENOL	850 UJ	1,200 UJ	850 UJ	1,100 UJ	930 UJ	1,000 UJ	1,400 UJ
2,4-DINITROTOLUENE	340 U	470 U	340 U	450 U	370 U	410 U	540 U
2,6-DINITROTOLUENE	340 U	470 U	340 U	450 U	370 U	410 U	540 U
2-CHLORONAPHTHALENE	340 U	470 U	340 U	450 U	370 U	410 U	540 U
2-CHLOROPHENOL	340 U	470 U	340 U	450 U	370 U	410 U	540 U
2-METHYLNAPHTHALENE	340 U	470 U	340 U	450 U	370 U	410 U	540 U
2-METHYLPHENOL	340 U	470 U	340 U	450 U	370 U	410 U	540 U
2-NITROANILINE	850 U	1,200 U	850 U	1,100 U	930 U	1,000 U	1,400 U
2-NITROPHENOL	340 U	470 U	340 U	450 U	370 U	410 U	540 U
3,3'-DICHLOROBENZIDINE	340 UJ	470 UJ	340 UJ	450 UJ	370 UJ	410 UJ	540 UJ

TABLE B-3 (Continued)

REMEDIAL INVESTIGATION ADDENDUM, ANALYTICAL RESULTS IN SOIL, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB
Point Name:	MW1-13	MW1-13
Sample ID:	149-S01-007	149-S01-008
Sample Date:	30-APR-98	30-APR-98
Screen Depth (feet bgs):	1.0 to 1.5	8.5 to 9.0
ECO Habitat:	UPLAND	UPLAND
PEST (ug/kg)		
AROCLOR-1254	18 U	97 U
AROCLOR-1260	18 U	**56** J
BETA-BHC	2 U	10 U
DELTA-BHC	2 U	10 U
DIELDRIN	4 U	20 U
ENDOSULFAN I	2 U	10 U
ENDOSULFAN II	4 U	20 U
ENDOSULFAN SULFATE	4 U	20 U
ENDRIN	4 U	20 U
ENDRIN ALDEHYDE	4 U	20 U
ENDRIN KETONE	4 U	20 U
GAMMA-BHC (LINDANE)	2 U	10 U
GAMMA-CHLORDANE	2 U	10 U
HEPTACHLOR	0.3 U	2 U
HEPTACHLOR EPOXIDE	0.3 U	2 U
METHOXYCHLOR	19 U	100 U
TOXAPHENE	94 U	520 U
SVOA (ug/kg)		
1,2,4-TRICHLOROBENZENE	360 UJ	400 U
1,2-DICHLOROBENZENE	180 U	190 U
1,3-DICHLOROBENZENE	180 U	190 U
1,4-DICHLOROBENZENE	180 U	190 U
2,2'-OXYBIS(1-CHLOROPROPANE)	360 U	400 U
2,4,5-TRICHLOROPHENOL	920 U	1,000 U
2,4,6-TRICHLOROPHENOL	360 U	400 U
2,4-DICHLOROPHENOL	360 U	400 U
2,4-DIMETHYLPHENOL	360 U	400 U
2,4-DINITROPHENOL	920 UJ	1,000 UJ
2,4-DINITROTOLUENE	360 U	400 U
2,6-DINITROTOLUENE	360 U	400 U
2-CHLORONAPHTHALENE	360 U	400 U
2-CHLOROPHENOL	360 U	400 U
2-METHYLNAPHTHALENE	360 U	400 U
2-METHYLPHENOL	360 U	400 U
2-NITROANILINE	920 U	1,000 U
2-NITROPHENOL	360 U	400 U
3,3'-DICHLOROBENZIDINE	360 UJ	400 UJ

TABLE B-3 (Continued)

REMEDIAL INVESTIGATION ADDENDUM, ANALYTICAL RESULTS IN SOIL, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB	SB	SB	SB	SB	SB
Point Name:	MW1-10	MW1-10	MW1-11A	MW1-11A	MW1-12	MW1-12	MW1-12
Sample ID:	149-S01-001	149-S01-002	149-S01-003	149-S01-004	149-S01-005	149-S01-006	149-S01-006A
Sample Date:	30-APR-98	30-APR-98	30-APR-98	30-APR-98	01-MAY-98	01-MAY-98	01-MAY-98
Screen Depth (feet bgs):	0.0 to 0.5	6.5 to 7.0	0.5 to 1.0	5.5 to 6.5	1.0 to 1.5	3.0 to 3.5	4.0 to 4.5
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
SVOA (ug/kg)							
3-NITROANILINE	850 UJ	1,200 UJ	850 UJ	1,100 UJ	930 UJ	1,000 UJ	1,400 UJ
4,6-DINITRO-2-METHYLPHENOL	850 UJ	1,200 UJ	850 UJ	1,100 UJ	930 UJ	1,000 UJ	1,400 U
4-BROMOPHENYL-PHENYLETHER	340 U	470 U	340 U	450 U	370 U	410 U	540 U
4-CHLORO-3-METHYLPHENOL	340 U	470 U	340 U	450 U	370 U	410 U	540 U
4-CHLOROANILINE	340 UJ	470 UJ	340 UJ	450 UJ	370 U	410 U	540 U
4-CHLOROPHENYL-PHENYLETHER	340 U	470 U	340 U	450 U	370 U	410 U	540 U
4-METHYLPHENOL	340 U	470 U	340 U	450 U	370 U	410 U	540 U
4-NITROANILINE	850 UJ	1,200 UJ	850 UJ	1,100 UJ	930 U	1,000 U	1,400 U
4-NITROPHENOL	850 UJ	1,200 UJ	850 UJ	1,100 UJ	930 U	1,000 U	1,400 UJ
ACENAPHTHENE	340 U	470 U	340 U	450 U	370 U	410 U	540 U
ACENAPHTHYLENE	340 U	470 U	340 U	450 U	370 U	410 U	540 U
ANTHRACENE	340 U	470 U	340 U	450 U	370 U	410 U	540 U
BENZO(A)ANTHRACENE	340 U	470 U	340 U	450 U	370 U	**120** J	540 U
BENZO(A)PYRENE	340 U	470 U	340 U	450 U	370 U	410 UJ	540 U
BENZO(B)FLUORANTHENE	340 U	470 U	340 U	450 U	370 U	**460** J	540 U
BENZO(G,H,I)PERYLENE	340 U	470 U	340 U	450 U	370 U	410 UJ	540 U
BENZO(K)FLUORANTHENE	340 U	470 U	340 U	450 U	370 U	410 UJ	540 U
BIS(2-CHLOROETHOXY)METHANE	340 U	470 U	340 U	450 U	370 UJ	410 UJ	540 UJ
BIS(2-CHLOROETHYL)ETHER	340 U	470 U	340 U	450 U	370 UJ	410 UJ	540 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	130 U	190 U	130 U	180 U	140 U	160 U	210 U
BUTYLBENZYLPHTHALATE	340 U	470 U	340 U	450 U	370 U	410 U	540 U
CARBAZOLE	340 U	470 U	340 U	450 U	370 U	410 U	540 U
CHRYSENE	340 U	470 U	340 U	450 U	**55** J	**200** J	540 U
DI-N-BUTYLPHTHALATE	340 U	470 U	340 U	450 U	370 UJ	410 U	540 U
DI-N-OCTYLPHTHALATE	340 U	470 U	340 U	450 U	370 U	410 UJ	540 U
DIBENZO(A,H)ANTHRACENE	340 U	470 U	340 U	450 U	370 U	410 UJ	540 U
DIBENZOFURAN	340 U	470 U	340 U	450 U	370 U	410 U	540 U
DIETHYLPHTHALATE	340 U	470 U	340 U	450 U	370 U	410 U	540 U
DIMETHYLPHTHALATE	340 U	470 U	340 U	450 U	370 U	410 U	540 U
FLUORANTHENE	340 U	470 U	340 U	450 U	370 U	**120** J	540 U
FLUORENE	340 U	470 U	340 U	450 U	370 U	410 U	540 U
HEXACHLOROBENZENE	340 U	470 U	340 U	450 U	370 U	410 U	540 U
HEXACHLOROBUTADIENE	340 U	470 U	340 U	450 U	370 U	410 U	540 U
HEXACHLOROCYCLOPENTADIENE	340 UJ	470 UJ	340 UJ	450 UJ	370 UJ	410 UJ	540 UJ
HEXACHLOROETHANE	340 U	470 U	340 U	450 U	370 U	410 U	540 U
INDENO(1,2,3-CD)PYRENE	340 U	470 U	340 U	450 U	370 U	410 UJ	540 U
ISOPHORONE	340 U	470 U	340 U	450 U	370 U	410 U	540 U

TABLE B-3 (Continued)

REMEDIAL INVESTIGATION ADDENDUM, ANALYTICAL RESULTS IN SOIL, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB
Point Name:	MW1-13	MW1-13
Sample ID:	149-S01-007	149-S01-008
Sample Date:	30-APR-98	30-APR-98
Screen Depth (feet bgs):	1.0 to 1.5	8.5 to 9.0
ECO Habitat:	UPLAND	UPLAND
SVOA (ug/kg)		
3-NITROANILINE	920 UJ	1,000 UJ
4,6-DINITRO-2-METHYLPHENOL	920 U	1,000 U
4-BROMOPHENYL-PHENYLETHER	360 U	400 U
4-CHLORO-3-METHYLPHENOL	360 U	400 U
4-CHLOROANILINE	360 U	400 U
4-CHLOROPHENYL-PHENYLETHER	360 U	400 U
4-METHYLPHENOL	360 U	400 U
4-NITROANILINE	920 U	1,000 U
4-NITROPHENOL	920 UJ	1,000 UJ
ACENAPHTHENE	360 U	400 U
ACENAPHTHYLENE	360 U	400 U
ANTHRACENE	360 U	400 U
BENZO(A)ANTHRACENE	360 U	400 U
BENZO(A)PYRENE	360 U	400 U
BENZO(B)FLUORANTHENE	360 U	400 U
BENZO(G,H,I)PERYLENE	360 U	400 U
BENZO(K)FLUORANTHENE	360 U	400 U
BIS(2-CHLOROETHOXY)METHANE	360 UJ	400 UJ
BIS(2-CHLOROETHYL)ETHER	360 UJ	400 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	140 U	160 U
BUTYLBENZYLPHTHALATE	360 U	400 U
CARBAZOLE	360 U	400 U
CHRYSENE	360 U	400 U
DI-N-BUTYLPHTHALATE	360 U	400 U
DI-N-OCTYLPHTHALATE	360 U	400 U
DIBENZO(A,H)ANTHRACENE	360 U	400 U
DIBENZOFURAN	360 U	400 U
DIETHYLPHTHALATE	360 U	400 U
DIMETHYLPHTHALATE	360 U	400 U
FLUORANTHENE	360 U	400 U
FLUORENE	360 U	400 U
HEXACHLOROBENZENE	360 U	400 U
HEXACHLOROBUTADIENE	360 U	400 U
HEXACHLOROCYCLOPENTADIENE	360 UJ	400 UJ
HEXACHLOROETHANE	360 U	400 U
INDENO(1,2,3-CD)PYRENE	360 U	400 U
ISOPHORONE	360 U	400 U

TABLE B-3 (Continued)

REMEDIAL INVESTIGATION ADDENDUM, ANALYTICAL RESULTS IN SOIL, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB	SB	SB	SB	SB	SB
Point Name:	MW1-10	MW1-10	MW1-11A	MW1-11A	MW1-12	MW1-12	MW1-12
Sample ID:	149-S01-001	149-S01-002	149-S01-003	149-S01-004	149-S01-005	149-S01-006	149-S01-006A
Sample Date:	30-APR-98	30-APR-98	30-APR-98	30-APR-98	01-MAY-98	01-MAY-98	01-MAY-98
Screen Depth (feet bgs):	0.0 to 0.5	6.5 to 7.0	0.5 to 1.0	5.5 to 6.5	1.0 to 1.5	3.0 to 3.5	4.0 to 4.5
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
SVOA (ug/kg)							
N-NITROSO-DI-N-PROPYLAMINE	340 U	470 U	340 U	450 U	370 U	410 U	540 U
N-NITROSODIPHENYLAMINE	340 U	470 U	340 U	450 U	370 U	410 U	540 U
NAPHTHALENE	340 U	470 U	340 U	450 U	370 U	410 U	540 U
NITROBENZENE	340 U	470 U	340 U	450 U	370 U	410 U	540 U
PENTACHLOROPHENOL	850 UJ	1,200 UJ	850 UJ	1,100 UJ	930 U	1,000 U	1,400 UJ
PHENANTHRENE	340 U	470 U	340 U	450 U	370 U	**51** J	540 U
PHENOL	340 U	470 U	340 U	450 U	370 UJ	410 UJ	540 UJ
PYRENE	340 U	470 U	340 U	450 U	**44** J	**160** J	540 U
VOA (ug/kg)							
1,1,1-TRICHLOROETHANE	10 U	14 U	10 U	13 U	11 U	12 U	16 U
1,1,2,2-TETRACHLOROETHANE	10 U	14 U	10 U	13 U	11 U	12 U	16 U
1,1,2-TRICHLOROETHANE	10 U	14 U	10 U	13 U	11 U	12 U	16 U
1,1-DICHLOROETHANE	10 U	14 U	10 U	13 U	11 U	12 U	16 U
1,1-DICHLOROETHENE	10 U	14 U	10 U	13 U	11 U	12 U	16 U
1,2-DICHLOROETHANE	10 U	14 U	10 U	13 U	11 U	12 U	16 U
1,2-DICHLOROETHENE (TOTAL)	10 U	14 U	10 U	13 U	11 U	12 U	16 U
1,2-DICHLOROPROPANE	10 U	14 U	10 U	13 U	11 U	12 U	16 U
2-BUTANONE	10 U	14 U	10 U	13 U	11 U	12 U	16 U
2-HEXANONE	10 U	14 U	10 U	13 U	11 U	12 U	16 U
4-METHYL-2-PENTANONE	10 U	14 U	10 U	13 U	11 U	12 U	16 U
ACETONE	6 UJ	28 UJ	20 UJ	29 UJ	11 UJ	12 UJ	16 UJ
BENZENE	10 U	14 U	10 U	13 U	11 U	12 U	16 U
BROMODICHLOROMETHANE	10 U	14 U	10 U	13 U	11 U	12 U	16 U
BROMOFORM	10 U	14 U	10 U	13 U	11 U	12 U	16 U
BROMOMETHANE	10 UJ	14 UJ	10 UJ	13 UJ	11 UJ	12 UJ	16 UJ
CARBON DISULFIDE	10 U	14 U	10 U	13 U	11 U	12 U	16 U
CARBON TETRACHLORIDE	10 U	14 U	10 U	13 U	11 U	12 U	16 U
CHLOROBENZENE	10 U	14 U	10 U	13 U	11 U	12 U	16 U
CHLOROETHANE	10 U	14 U	10 U	13 U	11 U	12 U	16 U
CHLOROFORM	10 U	14 U	10 U	13 U	11 U	12 U	16 U
CHLOROMETHANE	10 U	14 U	10 U	13 U	11 U	12 U	16 U
CIS-1,3-DICHLOROPROPENE	10 U	14 U	10 U	13 U	11 U	12 U	16 U
DIBROMOCHLOROMETHANE	10 U	14 U	10 U	13 U	11 U	12 U	16 U
ETHYLBENZENE	10 U	14 U	10 U	13 U	11 U	12 U	16 U
METHYLENE CHLORIDE	10 U	14 UJ	10 U	13 U	11 U	12 UJ	16 U
STYRENE	10 U	14 U	10 U	13 U	11 U	12 U	16 U
TETRACHLOROETHENE	10 U	14 U	**2** J	13 U	**2** J	12 U	16 U

TABLE B-3 (Continued)

REMEDIAL INVESTIGATION ADDENDUM, ANALYTICAL RESULTS IN SOIL, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB
Point Name:	MW1-13	MW1-13
Sample ID:	149-S01-007	149-S01-008
Sample Date:	30-APR-98	30-APR-98
Screen Depth (feet bgs):	1.0 to 1.5	8.5 to 9.0
ECO Habitat:	UPLAND	UPLAND
SVOA (ug/kg)		
N-NITROSO-DI-N-PROPYLAMINE	360 U	400 U
N-NITROSODIPHENYLAMINE	360 U	400 U
NAPHTHALENE	360 U	400 U
NITROBENZENE	360 U	400 U
PENTACHLOROPHENOL	920 UJ	1,000 UJ
PHENANTHRENE	360 U	400 U
PHENOL	360 UJ	400 UJ
PYRENE	360 U	400 U
VOA (ug/kg)		
1,1,1-TRICHLOROETHANE	11 U	12 U
1,1,2,2-TETRACHLOROETHANE	11 U	12 U
1,1,2-TRICHLOROETHANE	11 U	12 U
1,1-DICHLOROETHANE	11 U	12 U
1,1-DICHLOROETHENE	11 U	12 U
1,2-DICHLOROETHANE	11 U	12 U
1,2-DICHLOROETHENE (TOTAL)	11 U	12 U
1,2-DICHLOROPROPANE	11 U	12 U
2-BUTANONE	11 U	12 U
2-HEXANONE	11 U	12 U
4-METHYL-2-PENTANONE	11 U	12 U
ACETONE	11 UJ	26 UJ
BENZENE	11 U	12 U
BROMODICHLOROMETHANE	11 U	12 U
BROMOFORM	11 U	12 U
BROMOMETHANE	11 UJ	12 UJ
CARBON DISULFIDE	11 U	**0.6** J
CARBON TETRACHLORIDE	11 U	12 U
CHLOROBENZENE	11 U	12 U
CHLOROETHANE	11 U	12 U
CHLOROFORM	11 U	12 U
CHLOROMETHANE	11 U	12 U
CIS-1,3-DICHLOROPROPENE	11 U	12 U
DIBROMOCHLOROMETHANE	11 U	12 U
ETHYLBENZENE	11 U	12 U
METHYLENE CHLORIDE	11 UJ	12 UJ
STYRENE	11 U	12 U
TETRACHLOROETHENE	**2** J	12 U

TABLE B-3 (Continued)

REMEDIAL INVESTIGATION ADDENDUM, ANALYTICAL RESULTS IN SOIL, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB	SB	SB	SB	SB	SB
Point Name:	MW1-10	MW1-10	MW1-11A	MW1-11A	MW1-12	MW1-12	MW1-12
Sample ID:	149-S01-001	149-S01-002	149-S01-003	149-S01-004	149-S01-005	149-S01-006	149-S01-006A
Sample Date:	30-APR-98	30-APR-98	30-APR-98	30-APR-98	01-MAY-98	01-MAY-98	01-MAY-98
Screen Depth (feet bgs):	0.0 to 0.5	6.5 to 7.0	0.5 to 1.0	5.5 to 6.5	1.0 to 1.5	3.0 to 3.5	4.0 to 4.5
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
VOA (ug/kg)							
TOLUENE	10 U	14 U	10 U	13 U	11 U	12 U	16 U
TRANS-1,3-DICHLOROPROPENE	10 U	14 U	10 U	13 U	11 U	12 U	16 U
TRICHLOROETHENE	10 U	14 U	10 U	13 U	11 U	12 U	16 U
VINYL CHLORIDE	10 U	14 U	10 U	13 U	11 U	12 U	16 U
XYLENE (TOTAL)	10 U	14 U	10 U	13 U	11 U	12 U	16 U

TABLE B-3 (Continued)

REMEDIAL INVESTIGATION ADDENDUM, ANALYTICAL RESULTS IN SOIL, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB
Point Name:	MW1-13	MW1-13
Sample ID:	149-S01-007	149-S01-008
Sample Date:	30-APR-98	30-APR-98
Screen Depth (feet bgs):	1.0 to 1.5	8.5 to 9.0
ECO Habitat:	UPLAND	UPLAND
VOA (ug/kg)		
TOLUENE	11 U	12 U
TRANS-1,3-DICHLOROPROPENE	11 U	12 U
TRICHLOROETHENE	11 U	12 U
VINYL CHLORIDE	11 U	12 U
XYLENE (TOTAL)	11 U	12 U

Notes and Abbreviations:
- Detections appear in boldface type
- bgs - Below ground surface
- J - Estimated concentration
- NA - Not analyzed
- SB - Soil boring
- U - Not detected
- ug/kg - Micrograms per kilogram

TABLE B-4

REMEDIAL INVESTIGATION ADDENDUM, ANALYTICAL RESULTS IN SOIL, INORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB	SB	SB	SB	SB	SB
Point Name:	MW1-10	MW1-10	MW1-11A	MW1-11A	MW1-12	MW1-12	MW1-12
Sample ID:	149-S01-001	149-S01-002	149-S01-003	149-S01-004	149-S01-005	149-S01-006	149-S01-006A
Sample Date:	30-APR-98	30-APR-98	30-APR-98	30-APR-98	01-MAY-98	01-MAY-98	01-MAY-98
Screen Depth (feet bgs):	0.0 to 0.5	6.5 to 7.0	0.5 to 1.0	5.5 to 6.5	1.0 to 1.5	3.0 to 3.5	4.0 to 4.5
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
TMETAL (mg/kg)							
ALUMINUM	**2,050**	**14,400**	**2,070**	**16,900**	**8,700**	**8,270**	**18,300**
ANTIMONY	0.43 U	0.6 U	0.43 U	0.57 U	0.47 U	0.52 U	0.69 U
ARSENIC	1.7 UJ	**7**	**1.9** J	**8.5**	**3.7**	**4.4**	**12.6**
BARIUM	**26.7** J	**133**	**32.3** J	**210**	**73.4**	**92.1**	**160**
BERYLLIUM	0.04 U	0.06 U	0.04 U	0.05 U	0.05 U	0.05 U	0.25 UJ
CADMIUM	0.09 UJ	0.09 UJ	0.04 UJ	0.15 UJ	0.77 UJ	0.67 UJ	**1.8**
CALCIUM	**3,080**	**6,380**	**13,000**	**4,710**	**11,900**	**12,000**	**4,920**
CHROMIUM	**6.8**	**26.6**	**8.5**	**29.1**	**29.5**	**24.7**	**42.9**
COBALT	**2.5** J	**10.6** J	**2.9** J	**14.8**	**8.8** J	**7.9** J	**11.4** J
COPPER	2.4 UJ	**34.3**	3 UJ	**38.1**	**34.7**	**23.5**	**33.8**
IRON	**7,300**	**28,800**	**13,000**	**35,600**	**19,700**	**18,900**	**29,100**
LEAD	**2.3**	**9.7**	**3**	**10.7**	**37.3**	**24**	**21**
MAGNESIUM	**1,310**	**11,100**	**1,360**	**10,700**	**7,220**	**5,730**	**9,840**
MANGANESE	**63.5**	**275**	**70.8**	**415**	**281**	**274**	**203**
MERCURY	**0.1**	0.09 U	0.07 U	**1.1**	**0.23**	**0.22**	0.1 U
MOLYBDENUM	0.14 U	1.8 UJ	0.2 UJ	2.8 UJ	1.5 UJ	1.4 UJ	**3.6**
NICKEL	5.2 UJ	**31.4**	5.6 UJ	**29.6**	**24.7**	**21.9**	**48.6**
POTASSIUM	**435** J	**5,200** J	**473** J	**5,560** J	**1,920** J	**1,780** J	**5,590** J
SELENIUM	0.45 U	**1.1** J	0.45 U	**1.4**	**0.54** J	0.55 U	**1.6** J
SILVER	0.05 U	0.08 U	0.05 U	0.07 U	0.38 UJ	0.09 UJ	0.09 U
SODIUM	49.5 U	**5,020**	49.4 U	**3,600**	**724** J	212 UJ	**5,060**
THALLIUM	0.31 U	0.43 U	0.31 U	0.4 U	0.33 U	0.37 U	0.49 U
VANADIUM	**14.2**	**54.1**	**27.9**	**61.4**	**37**	**35.9**	**80.3**
ZINC	**14.2**	**96**	**14.7**	**97.8**	**84.1**	**76**	**97.8**

TABLE B-4 (Continued)

REMEDIAL INVESTIGATION ADDENDUM, ANALYTICAL RESULTS IN SOIL, INORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SB	SB
Point Name:	MW1-13	MW1-13
Sample ID:	149-S01-007	149-S01-008
Sample Date:	30-APR-98	30-APR-98
Screen Depth (feet bgs):	1.0 to 1.5	8.5 to 9.0
ECO Habitat:	UPLAND	UPLAND
TMETAL (mg/kg)		
ALUMINUM	**4,470**	**2,300**
ANTIMONY	0.46 U	0.51 U
ARSENIC	**3.6**	**2.3** J
BARIUM	**51.1**	**12.9** J
BERYLLIUM	0.04 U	0.05 U
CADMIUM	0.48 UJ	0.05 U
CALCIUM	**22,700**	**2,190**
CHROMIUM	**11.9**	**9.3**
COBALT	**4.3** J	**2.3** J
COPPER	**14.6**	**5** J
IRON	**11,600**	**11,200**
LEAD	**22.3**	**3.1**
MAGNESIUM	**3,380**	**1,140** J
MANGANESE	**142**	**74.6**
MERCURY	0.07 U	0.08 U
MOLYBDENUM	0.54 UJ	0.72 UJ
NICKEL	**10.8**	**5.3** J
POTASSIUM	**1,280** J	**615** J
SELENIUM	0.49 U	0.53 U
SILVER	0.14 UJ	0.06 U
SODIUM	**519** J	**482** J
THALLIUM	0.33 U	0.36 U
VANADIUM	**25.5**	**25.4**
ZINC	**38.2**	**21.1**

TABLE B-4 (Continued)

REMEDIAL INVESTIGATION ADDENDUM, ANALYTICAL RESULTS IN SOIL, INORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Notes and Abbreviations:
- Detections appear in boldface type
- bgs - Below ground surface
- J - Estimated concentration
- mg/kg - Milligrams per kilogram
- NA - Not analyzed
- SB - Soil boring
- U - Not detected

TABLE B-5

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-1	MW1-1	MW1-1	MW1-1	MW1-10	MW1-10	MW1-10
Sample ID:	273-S01-001	273-S01-003	273-S01-004	273-S01-005	149-S01-009	149-S01-032	149-S01-050
Sample Date:	07-FEB-94	03-MAY-94	02-AUG-94	31-OCT-94	21-MAY-98	20-AUG-98	09-NOV-98
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
DIOXIN (ug/L)							
HEPTACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HEPTACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HEXACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HEXACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
OCTACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
OCTACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PENTACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PENTACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TETRACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TETRACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PAH (ug/L)							
2-METHYLNAPHTHALENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ACENAPHTHENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ACENAPHTHYLENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ANTHRACENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BENZO(A)ANTHRACENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BENZO(A)PYRENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BENZO(B)FLUORANTHENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BENZO(G,H,I)PERYLENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BENZO(K)FLUORANTHENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CHRYSENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DIBENZO(A,H)ANTHRACENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FLUORANTHENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FLUORENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
INDENO(1,2,3-CD)PYRENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NAPHTHALENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PHENANTHRENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PYRENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEST (ug/L)							
4,4'-DDD	0.1 U	0.1 U	0.1 UJ	0.1 U	0.02 U	N/A	N/A
4,4'-DDE	0.1 U	0.1 U	0.1 UJ	0.1 U	0.02 U	N/A	N/A
4,4'-DDT	0.1 U	0.1 U	0.1 UJ	0.1 U	0.02 UJ	N/A	N/A
ALDRIN	0.05 U	0.05 U	0.05 UJ	0.05 U	0.01 U	N/A	N/A
ALPHA-BHC	0.05 UJ	0.05 UJ	0.05 UJ	0.05 U	0.01 U	N/A	N/A
ALPHA-CHLORDANE	0.05 U	0.05 U	0.05 UJ	0.05 U	0.01 U	N/A	N/A
AROCLOR-1016	1 U	1 U	1 UJ	0.5 U	0.2 U	N/A	N/A
AROCLOR-1221	2 U	2 U	2 UJ	0.5 U	0.4 U	N/A	N/A

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-10	MW1-11A	MW1-11A	MW1-11A	MW1-11A	MW1-11C	MW1-11C
Sample ID:	149-S01-070	149-S01-010	149-S01-033	149-S01-051	149-S01-071	149-S01-011	149-S01-034
Sample Date:	08-FEB-99	22-MAY-98	20-AUG-98	06-NOV-98	08-FEB-99	04-JUN-98	20-AUG-98
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
DIOXIN (ug/L)							
HEPTACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HEPTACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HEXACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HEXACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
OCTACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
OCTACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PENTACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PENTACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TETRACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TETRACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PAH (ug/L)							
2-METHYLNAPHTHALENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ACENAPHTHENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ACENAPHTHYLENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ANTHRACENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BENZO(A)ANTHRACENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BENZO(A)PYRENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BENZO(B)FLUORANTHENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BENZO(G,H,I)PERYLENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BENZO(K)FLUORANTHENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CHRYSENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DIBENZO(A,H)ANTHRACENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FLUORANTHENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FLUORENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
INDENO(1,2,3-CD)PYRENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NAPHTHALENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PHENANTHRENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PYRENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEST (ug/L)							
4,4'-DDD	N/A	0.02 U	N/A	N/A	N/A	0.02 U	N/A
4,4'-DDE	N/A	0.02 U	N/A	N/A	N/A	0.02 U	N/A
4,4'-DDT	N/A	0.02 UJ	N/A	N/A	N/A	0.02 UJ	N/A
ALDRIN	N/A	0.01 U	N/A	N/A	N/A	0.01 U	N/A
ALPHA-BHC	N/A	0.01 U	N/A	N/A	N/A	0.01 U	N/A
ALPHA-CHLORDANE	N/A	0.01 U	N/A	N/A	N/A	0.01 U	N/A
AROCLOR-1016	N/A	0.2 U	N/A	N/A	N/A	0.2 U	N/A
AROCLOR-1221	N/A	0.4 U	N/A	N/A	N/A	0.4 U	N/A

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-11C	MW1-11C	MW1-12	MW1-12	MW1-12	MW1-12	MW1-13
Sample ID:	149-S01-052	149-S01-072	149-S01-012	149-S01-036	149-S01-053	149-S01-073	149-S01-014
Sample Date:	12-NOV-98	08-FEB-99	26-MAY-98	21-AUG-98	09-NOV-98	08-FEB-99	26-MAY-98
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	UPLAND
DIOXIN (ug/L)							
HEPTACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HEPTACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HEXACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HEXACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
OCTACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
OCTACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PENTACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PENTACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TETRACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TETRACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PAH (ug/L)							
2-METHYLNAPHTHALENE	N/A	N/A	N/A	N/A	N/A	0.1 U	N/A
ACENAPHTHENE	N/A	N/A	N/A	N/A	0.1 U	0.1 U	N/A
ACENAPHTHYLENE	N/A	N/A	N/A	N/A	0.1 U	0.1 U	N/A
ANTHRACENE	N/A	N/A	N/A	N/A	0.1 U	0.1 U	N/A
BENZO(A)ANTHRACENE	N/A	N/A	N/A	N/A	0.1 U	0.1 U	N/A
BENZO(A)PYRENE	N/A	N/A	N/A	N/A	0.1 U	0.1 U	N/A
BENZO(B)FLUORANTHENE	N/A	N/A	N/A	N/A	0.1 U	0.1 U	N/A
BENZO(G,H,I)PERYLENE	N/A	N/A	N/A	N/A	0.1 U	0.1 U	N/A
BENZO(K)FLUORANTHENE	N/A	N/A	N/A	N/A	0.1 U	0.1 U	N/A
CHRYSENE	N/A	N/A	N/A	N/A	0.1 U	0.1 U	N/A
DIBENZO(A,H)ANTHRACENE	N/A	N/A	N/A	N/A	0.1 U	0.1 U	N/A
FLUORANTHENE	N/A	N/A	N/A	N/A	0.1 U	0.1 U	N/A
FLUORENE	N/A	N/A	N/A	N/A	0.1 U	0.1 U	N/A
INDENO(1,2,3-CD)PYRENE	N/A	N/A	N/A	N/A	0.1 U	0.1 U	N/A
NAPHTHALENE	N/A	N/A	N/A	N/A	0.1 U	0.1 U	N/A
PHENANTHRENE	N/A	N/A	N/A	N/A	0.1 U	0.1 U	N/A
PYRENE	N/A	N/A	N/A	N/A	0.1 U	0.1 U	N/A
PEST (ug/L)							
4,4'-DDD	N/A	N/A	0.02 U	N/A	N/A	N/A	0.02 U
4,4'-DDE	N/A	N/A	0.02 U	N/A	N/A	N/A	0.02 U
4,4'-DDT	N/A	N/A	0.02 UJ	N/A	N/A	N/A	0.02 UJ
ALDRIN	N/A	N/A	0.01 U	N/A	N/A	N/A	0.01 U
ALPHA-BHC	N/A	N/A	0.01 U	N/A	N/A	N/A	0.01 U
ALPHA-CHLORDANE	N/A	N/A	0.01 U	N/A	N/A	N/A	0.01 U
AROCLOR-1016	N/A	N/A	0.2 U	N/A	N/A	N/A	0.2 U
AROCLOR-1221	N/A	N/A	0.4 U	N/A	N/A	N/A	0.4 U

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-13	MW1-13	MW1-13	MW1-2	MW1-2	MW1-2	MW1-2
Sample ID:	149-S01-037	149-S01-054	149-S01-074	273-S01-006	273-S01-007	273-S01-008	273-S01-009
Sample Date:	21-AUG-98	06-NOV-98	08-FEB-99	07-FEB-94	11-MAY-94	08-AUG-94	02-NOV-94
Screen Depth (feet bgs):							
ECO Habitat:	UPLAND	UPLAND	UPLAND	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
DIOXIN (ug/L)							
HEPTACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HEPTACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HEXACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HEXACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
OCTACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
OCTACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PENTACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PENTACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TETRACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TETRACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PAH (ug/L)							
2-METHYLNAPHTHALENE	N/A	N/A	**0.21**	N/A	N/A	N/A	N/A
ACENAPHTHENE	N/A	0.1 U	**0.1**	N/A	N/A	N/A	N/A
ACENAPHTHYLENE	N/A	0.1 U	0.1 U	N/A	N/A	N/A	N/A
ANTHRACENE	N/A	0.1 U	0.1 U	N/A	N/A	N/A	N/A
BENZO(A)ANTHRACENE	N/A	0.1 U	0.1 U	N/A	N/A	N/A	N/A
BENZO(A)PYRENE	N/A	0.1 U	0.1 U	N/A	N/A	N/A	N/A
BENZO(B)FLUORANTHENE	N/A	0.1 U	0.1 U	N/A	N/A	N/A	N/A
BENZO(G,H,I)PERYLENE	N/A	0.1 U	0.1 U	N/A	N/A	N/A	N/A
BENZO(K)FLUORANTHENE	N/A	0.1 U	0.1 U	N/A	N/A	N/A	N/A
CHRYSENE	N/A	0.1 U	0.1 U	N/A	N/A	N/A	N/A
DIBENZO(A,H)ANTHRACENE	N/A	0.1 U	0.1 U	N/A	N/A	N/A	N/A
FLUORANTHENE	N/A	0.1 U	0.1 U	N/A	N/A	N/A	N/A
FLUORENE	N/A	0.1 U	0.1 U	N/A	N/A	N/A	N/A
INDENO(1,2,3-CD)PYRENE	N/A	0.1 U	0.1 U	N/A	N/A	N/A	N/A
NAPHTHALENE	N/A	0.1 U	**0.3**	N/A	N/A	N/A	N/A
PHENANTHRENE	N/A	0.1 U	0.1 U	N/A	N/A	N/A	N/A
PYRENE	N/A	0.1 U	0.1 U	N/A	N/A	N/A	N/A
PEST (ug/L)							
4,4'-DDD	N/A	N/A	N/A	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
4,4'-DDE	N/A	N/A	N/A	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
4,4'-DDT	N/A	N/A	N/A	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
ALDRIN	N/A	N/A	N/A	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
ALPHA-BHC	N/A	N/A	N/A	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
ALPHA-CHLORDANE	N/A	N/A	N/A	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
AROCLOR-1016	N/A	N/A	N/A	1 UJ	1 UJ	1 UJ	0.5 UJ
AROCLOR-1221	N/A	N/A	N/A	2 UJ	2 UJ	2 UJ	0.5 UJ

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-3	MW1-3	MW1-3	MW1-3	MW1-4	MW1-4	MW1-4
Sample ID:	273-S01-010	273-S01-011	273-S01-013	273-S01-014	273-S01-015	273-S01-016	273-S01-017
Sample Date:	07-FEB-94	10-MAY-94	02-AUG-94	31-OCT-94	06-FEB-94	11-MAY-94	08-AUG-94
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
DIOXIN (ug/L)							
HEPTACHLORINATED DIBENZO-P-DIOXIN	0.03 U	0.03 U	N/A	0.025 U	N/A	N/A	N/A
HEPTACHLORINATED DIBENZOFURAN	0.03 U	0.03 U	N/A	0.025 U	N/A	N/A	N/A
HEXACHLORINATED DIBENZO-P-DIOXIN	0.03 U	0.03 U	N/A	0.025 U	N/A	N/A	N/A
HEXACHLORINATED DIBENZOFURAN	0.03 U	0.03 U	N/A	0.025 U	N/A	N/A	N/A
OCTACHLORINATED DIBENZO-P-DIOXIN	0.05 U	0.05 U	N/A	0.05 U	N/A	N/A	N/A
OCTACHLORINATED DIBENZOFURAN	0.05 U	0.05 U	N/A	0.05 U	N/A	N/A	N/A
PENTACHLORINATED DIBENZO-P-DIOXIN	0.03 U	0.03 U	N/A	0.025 U	N/A	N/A	N/A
PENTACHLORINATED DIBENZOFURAN	0.03 U	0.03 U	N/A	0.025 U	N/A	N/A	N/A
TETRACHLORINATED DIBENZO-P-DIOXIN	0.01 U	0.01 U	N/A	0.01 U	N/A	N/A	N/A
TETRACHLORINATED DIBENZOFURAN	0.01 U	0.01 U	N/A	0.01 U	N/A	N/A	N/A
PAH (ug/L)							
2-METHYLNAPHTHALENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ACENAPHTHENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ACENAPHTHYLENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ANTHRACENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BENZO(A)ANTHRACENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BENZO(A)PYRENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BENZO(B)FLUORANTHENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BENZO(G,H,I)PERYLENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BENZO(K)FLUORANTHENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CHRYSENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DIBENZO(A,H)ANTHRACENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FLUORANTHENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FLUORENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
INDENO(1,2,3-CD)PYRENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NAPHTHALENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PHENANTHRENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PYRENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEST (ug/L)							
4,4'-DDD	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
4,4'-DDE	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
4,4'-DDT	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
ALDRIN	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
ALPHA-BHC	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
ALPHA-CHLORDANE	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
AROCLOR-1016	1 UJ	1 UJ	1 UJ	0.5 UJ	1 UJ	1 UJ	1 UJ
AROCLOR-1221	2 UJ	2 UJ	2 UJ	0.5 UJ	2 UJ	2 UJ	2 UJ

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-4	MW1-4	MW1-4	MW1-4	MW1-4	MW1-5R	MW1-5R
Sample ID:	273-S01-018	149-S01-015	149-S01-038	149-S01-056	149-S01-075	273-S01-028	273-S01-029
Sample Date:	02-NOV-94	21-MAY-98	24-AUG-98	09-NOV-98	09-FEB-99	06-FEB-94	03-MAY-94
Screen Depth (feet bgs):						7.0 to 17.0	7.0 to 17.0
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	UPLAND	UPLAND
DIOXIN (ug/L)							
HEPTACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	0.03 U	N/A
HEPTACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	0.03 U	N/A
HEXACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	0.03 U	N/A
HEXACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	0.03 U	N/A
OCTACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	0.05 U	N/A
OCTACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	0.05 U	N/A
PENTACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	0.03 U	N/A
PENTACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	0.03 U	N/A
TETRACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	0.01 U	N/A
TETRACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	0.01 U	N/A
PAH (ug/L)							
2-METHYLNAPHTHALENE	N/A	N/A	N/A	N/A	0.1 U	N/A	N/A
ACENAPHTHENE	N/A	N/A	N/A	0.1 U	0.1 UJ	N/A	N/A
ACENAPHTHYLENE	N/A	N/A	N/A	0.1 U	0.1 U	N/A	N/A
ANTHRACENE	N/A	N/A	N/A	0.1 U	0.1 U	N/A	N/A
BENZO(A)ANTHRACENE	N/A	N/A	N/A	0.1 U	0.1 U	N/A	N/A
BENZO(A)PYRENE	N/A	N/A	N/A	0.1 U	0.1 UJ	N/A	N/A
BENZO(B)FLUORANTHENE	N/A	N/A	N/A	0.1 U	0.1 U	N/A	N/A
BENZO(G,H,I)PERYLENE	N/A	N/A	N/A	0.1 U	0.1 U	N/A	N/A
BENZO(K)FLUORANTHENE	N/A	N/A	N/A	0.1 U	0.1 U	N/A	N/A
CHRYSENE	N/A	N/A	N/A	0.1 U	0.1 U	N/A	N/A
DIBENZO(A,H)ANTHRACENE	N/A	N/A	N/A	0.1 U	0.1 U	N/A	N/A
FLUORANTHENE	N/A	N/A	N/A	0.1 U	0.1 UJ	N/A	N/A
FLUORENE	N/A	N/A	N/A	0.1 U	0.1 U	N/A	N/A
INDENO(1,2,3-CD)PYRENE	N/A	N/A	N/A	0.1 U	0.1 U	N/A	N/A
NAPHTHALENE	N/A	N/A	N/A	0.1 U	0.1 U	N/A	N/A
PHENANTHRENE	N/A	N/A	N/A	0.1 U	0.1 U	N/A	N/A
PYRENE	N/A	N/A	N/A	0.1 U	0.1 UJ	N/A	N/A
PEST (ug/L)							
4,4'-DDD	0.1 UJ	0.02 U	N/A	N/A	N/A	0.1 UJ	0.1 UJ
4,4'-DDE	0.1 UJ	0.02 U	N/A	N/A	N/A	0.1 UJ	0.1 UJ
4,4'-DDT	0.1 UJ	0.02 UJ	N/A	N/A	N/A	0.1 UJ	0.1 UJ
ALDRIN	0.05 UJ	0.01 U	N/A	N/A	N/A	0.05 UJ	0.05 UJ
ALPHA-BHC	0.05 UJ	0.01 U	N/A	N/A	N/A	0.05 UJ	0.05 UJ
ALPHA-CHLORDANE	0.05 UJ	0.01 U	N/A	N/A	N/A	0.05 UJ	0.05 UJ
AROCLOR-1016	0.5 UJ	0.2 U	N/A	N/A	N/A	1 UJ	1 UJ
AROCLOR-1221	0.5 UJ	0.4 U	N/A	N/A	N/A	2 UJ	2 UJ

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-5R	MW1-5R	MW1-5R	MW1-5R	MW1-5R	MW1-5R	MW1-6
Sample ID:	273-S01-030	273-S01-031	149-S01-016	149-S01-039	149-S01-057	149-S01-077	273-S01-019
Sample Date:	02-AUG-94	31-OCT-94	26-MAY-98	21-AUG-98	09-NOV-98	09-FEB-99	06-FEB-94
Screen Depth (feet bgs):	7.0 to 17.0	7.0 to 17.0	7.0 to 17.0	7.0 to 17.0	7.0 to 17.0	7.0 to 17.0	
ECO Habitat:	UPLAND	UPLAND	UPLAND	UPLAND	UPLAND	UPLAND	TIDAL MARSH
DIOXIN (ug/L)							
HEPTACHLORINATED DIBENZO-P-DIOXIN	0.025 U	0.025 U	N/A	N/A	N/A	N/A	N/A
HEPTACHLORINATED DIBENZOFURAN	0.025 U	0.025 U	N/A	N/A	N/A	N/A	N/A
HEXACHLORINATED DIBENZO-P-DIOXIN	0.025 U	0.025 U	N/A	N/A	N/A	N/A	N/A
HEXACHLORINATED DIBENZOFURAN	0.025 U	0.025 U	N/A	N/A	N/A	N/A	N/A
OCTACHLORINATED DIBENZO-P-DIOXIN	0.05 U	0.05 U	N/A	N/A	N/A	N/A	N/A
OCTACHLORINATED DIBENZOFURAN	0.05 U	0.05 U	N/A	N/A	N/A	N/A	N/A
PENTACHLORINATED DIBENZO-P-DIOXIN	0.025 U	0.025 U	N/A	N/A	N/A	N/A	N/A
PENTACHLORINATED DIBENZOFURAN	0.025 U	0.025 U	N/A	N/A	N/A	N/A	N/A
TETRACHLORINATED DIBENZO-P-DIOXIN	0.01 U	0.01 U	N/A	N/A	N/A	N/A	N/A
TETRACHLORINATED DIBENZOFURAN	0.01 U	0.01 U	N/A	N/A	N/A	N/A	N/A
PAH (ug/L)							
2-METHYLNAPHTHALENE	N/A	N/A	N/A	N/A	N/A	0.1 U	N/A
ACENAPHTHENE	N/A	N/A	N/A	N/A	0.1 U	0.1 U	N/A
ACENAPHTHYLENE	N/A	N/A	N/A	N/A	0.1 U	0.1 U	N/A
ANTHRACENE	N/A	N/A	N/A	N/A	0.1 U	0.1 U	N/A
BENZO(A)ANTHRACENE	N/A	N/A	N/A	N/A	0.1 U	0.1 U	N/A
BENZO(A)PYRENE	N/A	N/A	N/A	N/A	0.1 U	0.1 U	N/A
BENZO(B)FLUORANTHENE	N/A	N/A	N/A	N/A	0.1 U	0.1 U	N/A
BENZO(G,H,I)PERYLENE	N/A	N/A	N/A	N/A	0.1 U	0.1 U	N/A
BENZO(K)FLUORANTHENE	N/A	N/A	N/A	N/A	0.1 U	0.1 U	N/A
CHRYSENE	N/A	N/A	N/A	N/A	0.1 U	0.1 U	N/A
DIBENZO(A,H)ANTHRACENE	N/A	N/A	N/A	N/A	0.1 U	0.1 U	N/A
FLUORANTHENE	N/A	N/A	N/A	N/A	0.1 U	0.1 U	N/A
FLUORENE	N/A	N/A	N/A	N/A	0.1 U	0.1 U	N/A
INDENO(1,2,3-CD)PYRENE	N/A	N/A	N/A	N/A	0.1 U	0.1 U	N/A
NAPHTHALENE	N/A	N/A	N/A	N/A	0.1 U	0.1 U	N/A
PHENANTHRENE	N/A	N/A	N/A	N/A	0.1 U	0.1 U	N/A
PYRENE	N/A	N/A	N/A	N/A	0.1 U	0.1 U	N/A
PEST (ug/L)							
4,4'-DDD	0.1 UJ	0.1 UJ	0.02 U	N/A	N/A	N/A	0.1 UJ
4,4'-DDE	0.1 UJ	0.1 UJ	0.02 U	N/A	N/A	N/A	0.1 UJ
4,4'-DDT	0.1 UJ	0.1 UJ	0.02 UJ	N/A	N/A	N/A	0.1 UJ
ALDRIN	0.05 UJ	0.05 UJ	0.01 U	N/A	N/A	N/A	0.05 UJ
ALPHA-BHC	0.05 UJ	0.05 UJ	0.01 U	N/A	N/A	N/A	0.05 UJ
ALPHA-CHLORDANE	0.05 UJ	0.05 UJ	0.01 U	N/A	N/A	N/A	0.05 UJ
AROCLOR-1016	1 UJ	0.5 UJ	0.2 U	N/A	N/A	N/A	1 UJ
AROCLOR-1221	2 UJ	0.5 UJ	0.4 U	N/A	N/A	N/A	2 UJ

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-6	MW1-6	MW1-6	MW1-7	MW1-7	MW1-7	MW1-7
Sample ID:	273-S01-020	273-S01-021	273-S01-023	273-S01-024	273-S01-025	273-S01-026	273-S01-027
Sample Date:	03-MAY-94	02-AUG-94	31-OCT-94	06-FEB-94	11-MAY-94	08-AUG-94	02-NOV-94
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	UPLAND	UPLAND	UPLAND	UPLAND
DIOXIN (ug/L)							
HEPTACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HEPTACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HEXACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HEXACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
OCTACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
OCTACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PENTACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PENTACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TETRACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TETRACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PAH (ug/L)							
2-METHYLNAPHTHALENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ACENAPHTHENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ACENAPHTHYLENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ANTHRACENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BENZO(A)ANTHRACENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BENZO(A)PYRENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BENZO(B)FLUORANTHENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BENZO(G,H,I)PERYLENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BENZO(K)FLUORANTHENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CHRYSENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DIBENZO(A,H)ANTHRACENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FLUORANTHENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FLUORENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
INDENO(1,2,3-CD)PYRENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NAPHTHALENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PHENANTHRENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PYRENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEST (ug/L)							
4,4'-DDD	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
4,4'-DDE	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
4,4'-DDT	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
ALDRIN	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
ALPHA-BHC	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
ALPHA-CHLORDANE	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
AROCLOR-1016	1 UJ	1 UJ	0.5 UJ	1 UJ	1 UJ	1 UJ	0.5 UJ
AROCLOR-1221	2 UJ	2 UJ	0.5 UJ	2 UJ	2 UJ	2 UJ	0.5 UJ

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-8	MW1-8	MW1-8	MW1-8	MW1-8	MW1-8	MW1-8
Sample ID:	273-S01-124	273-S01-126	273-S01-128	273-S01-130	149-S01-017	149-S01-040	149-S01-058
Sample Date:	06-FEB-94	11-MAY-94	08-AUG-94	02-NOV-94	27-MAY-98	24-AUG-98	06-NOV-98
Screen Depth (feet bgs):	6.0 to 17.0	6.0 to 17.0	6.0 to 17.0	6.0 to 17.0	6.0 to 17.0	6.0 to 17.0	6.0 to 17.0
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
DIOXIN (ug/L)							
HEPTACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HEPTACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HEXACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HEXACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
OCTACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
OCTACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PENTACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PENTACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TETRACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TETRACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PAH (ug/L)							
2-METHYLNAPHTHALENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ACENAPHTHENE	N/A	N/A	N/A	N/A	N/A	N/A	**0.2**
ACENAPHTHYLENE	N/A	N/A	N/A	N/A	N/A	N/A	0.1 U
ANTHRACENE	N/A	N/A	N/A	N/A	N/A	N/A	0.1 U
BENZO(A)ANTHRACENE	N/A	N/A	N/A	N/A	N/A	N/A	0.1 U
BENZO(A)PYRENE	N/A	N/A	N/A	N/A	N/A	N/A	0.1 U
BENZO(B)FLUORANTHENE	N/A	N/A	N/A	N/A	N/A	N/A	0.1 U
BENZO(G,H,I)PERYLENE	N/A	N/A	N/A	N/A	N/A	N/A	0.1 U
BENZO(K)FLUORANTHENE	N/A	N/A	N/A	N/A	N/A	N/A	0.1 U
CHRYSENE	N/A	N/A	N/A	N/A	N/A	N/A	0.1 U
DIBENZO(A,H)ANTHRACENE	N/A	N/A	N/A	N/A	N/A	N/A	0.1 U
FLUORANTHENE	N/A	N/A	N/A	N/A	N/A	N/A	0.1 U
FLUORENE	N/A	N/A	N/A	N/A	N/A	N/A	**0.23**
INDENO(1,2,3-CD)PYRENE	N/A	N/A	N/A	N/A	N/A	N/A	0.1 U
NAPHTHALENE	N/A	N/A	N/A	N/A	N/A	N/A	**0.35**
PHENANTHRENE	N/A	N/A	N/A	N/A	N/A	N/A	0.1 U
PYRENE	N/A	N/A	N/A	N/A	N/A	N/A	0.1 U
PEST (ug/L)							
4,4'-DDD	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.02 U	N/A	N/A
4,4'-DDE	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.02 U	N/A	N/A
4,4'-DDT	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.02 UJ	N/A	N/A
ALDRIN	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.01 U	N/A	N/A
ALPHA-BHC	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.01 U	N/A	N/A
ALPHA-CHLORDANE	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.01 U	N/A	N/A
AROCLOR-1016	1 UJ	1 UJ	1 UJ	0.5 UJ	0.2 U	N/A	N/A
AROCLOR-1221	2 UJ	2 UJ	2 UJ	0.5 UJ	0.4 U	N/A	N/A

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW
Point Name:	MW1-8	MW1-9	MW1-9	MW1-9	MW1-9
Sample ID:	149-S01-078	273-S01-125	273-S01-127	273-S01-129	273-S01-131
Sample Date:	09-FEB-99	06-FEB-94	11-MAY-94	09-AUG-94	02-NOV-94
Screen Depth (feet bgs):	6.0 to 17.0	3.0 to 13.0	3.0 to 13.0	3.0 to 13.0	3.0 to 13.0
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
DIOXIN (ug/L)					
HEPTACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A
HEPTACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A
HEXACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A
HEXACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A
OCTACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A
OCTACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A
PENTACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A
PENTACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A
TETRACHLORINATED DIBENZO-P-DIOXIN	N/A	N/A	N/A	N/A	N/A
TETRACHLORINATED DIBENZOFURAN	N/A	N/A	N/A	N/A	N/A
PAH (ug/L)					
2-METHYLNAPHTHALENE	0.1 U	N/A	N/A	N/A	N/A
ACENAPHTHENE	0.1 U	N/A	N/A	N/A	N/A
ACENAPHTHYLENE	0.1 U	N/A	N/A	N/A	N/A
ANTHRACENE	0.1 U	N/A	N/A	N/A	N/A
BENZO(A)ANTHRACENE	0.1 U	N/A	N/A	N/A	N/A
BENZO(A)PYRENE	0.1 U	N/A	N/A	N/A	N/A
BENZO(B)FLUORANTHENE	0.1 U	N/A	N/A	N/A	N/A
BENZO(G,H,I)PERYLENE	0.1 U	N/A	N/A	N/A	N/A
BENZO(K)FLUORANTHENE	0.1 U	N/A	N/A	N/A	N/A
CHRYSENE	0.1 U	N/A	N/A	N/A	N/A
DIBENZO(A,H)ANTHRACENE	0.1 U	N/A	N/A	N/A	N/A
FLUORANTHENE	0.1 U	N/A	N/A	N/A	N/A
FLUORENE	0.1 U	N/A	N/A	N/A	N/A
INDENO(1,2,3-CD)PYRENE	0.1 U	N/A	N/A	N/A	N/A
NAPHTHALENE	0.1 U	N/A	N/A	N/A	N/A
PHENANTHRENE	0.1 U	N/A	N/A	N/A	N/A
PYRENE	0.1 U	N/A	N/A	N/A	N/A
PEST (ug/L)					
4,4'-DDD	N/A	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
4,4'-DDE	N/A	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
4,4'-DDT	N/A	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
ALDRIN	N/A	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ
ALPHA-BHC	N/A	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
ALPHA-CHLORDANE	N/A	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
AROCLOR-1016	N/A	1 U	1 UJ	1 UJ	0.5 UJ
AROCLOR-1221	N/A	2 U	2 UJ	2 UJ	0.5 UJ

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-1	MW1-1	MW1-1	MW1-1	MW1-10	MW1-10	MW1-10
Sample ID:	273-S01-001	273-S01-003	273-S01-004	273-S01-005	149-S01-009	149-S01-032	149-S01-050
Sample Date:	07-FEB-94	03-MAY-94	02-AUG-94	31-OCT-94	21-MAY-98	20-AUG-98	09-NOV-98
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
PEST (ug/L)							
AROCLOR-1232	1 U	1 U	1 UJ	0.5 U	0.2 U	N/A	N/A
AROCLOR-1242	1 U	1 U	1 UJ	0.5 U	0.2 U	N/A	N/A
AROCLOR-1248	1 U	1 U	1 UJ	0.5 U	0.2 U	N/A	N/A
AROCLOR-1254	1 U	1 U	1 UJ	0.5 U	0.2 U	N/A	N/A
AROCLOR-1260	1 U	1 U	1 UJ	0.5 U	0.2 U	N/A	N/A
BETA-BHC	0.05 U	0.05 U	0.05 UJ	0.05 U	0.01 U	N/A	N/A
DELTA-BHC	0.05 UJ	0.05 U	0.05 UJ	0.05 U	0.01 U	N/A	N/A
DIELDRIN	0.1 U	0.1 U	0.1 UJ	0.1 U	0.02 U	N/A	N/A
ENDOSULFAN I	0.05 U	0.05 U	0.05 UJ	0.05 U	0.01 U	N/A	N/A
ENDOSULFAN II	0.1 U	0.1 U	0.1 UJ	0.1 U	0.02 U	N/A	N/A
ENDOSULFAN SULFATE	0.1 U	0.1 U	0.1 UJ	0.1 U	0.02 U	N/A	N/A
ENDRIN	0.1 U	0.1 U	0.1 UJ	0.1 U	0.02 U	N/A	N/A
ENDRIN ALDEHYDE	0.1 U	0.1 U	0.1 UJ	0.1 U	0.02 U	N/A	N/A
ENDRIN KETONE	0.1 U	0.1 U	0.1 UJ	0.1 U	0.02 U	N/A	N/A
GAMMA-BHC (LINDANE)	0.05 U	0.05 UJ	0.05 UJ	0.05 U	0.01 U	N/A	N/A
GAMMA-CHLORDANE	0.05 U	0.05 U	0.05 UJ	0.05 U	0.01 U	N/A	N/A
HEPTACHLOR	0.05 U	0.05 U	0.05 UJ	0.05 U	0.01 U	N/A	N/A
HEPTACHLOR EPOXIDE	0.05 U	0.05 U	0.05 UJ	0.01 U	0.01 U	N/A	N/A
METHOXYCHLOR	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.1 U	N/A	N/A
TOXAPHENE	5 U	5 U	5 UJ	3 U	1 U	N/A	N/A
SOLIDS (mg/L)							
TOTAL DISSOLVED SOLIDS	**14,000**	**11,100**	**13,800**	**17,200**	**6,900** J	**13,800**	**22,500**
SVOA (ug/L)							
1,2,4-TRICHLOROBENZENE	10 U	10 U	10 U	10 U	1 U	N/A	N/A
1,2-DICHLOROBENZENE	10 U	5 U	5 U	5 U	1 U	N/A	N/A
1,3-DICHLOROBENZENE	10 U	5 U	5 U	5 U	1 U	N/A	N/A
1,4-DICHLOROBENZENE	5 U	5 U	5 U	5 U	1 U	N/A	N/A
2,2'-OXYBIS(1-CHLOROPROPANE)	10 U	10 U	10 U	10 U	1 U	N/A	N/A
2,4,5-TRICHLOROPHENOL	25 U	25 U	25 U	25 U	3 U	N/A	N/A
2,4,6-TRICHLOROPHENOL	10 U	10 U	10 U	10 U	2 U	N/A	N/A
2,4-DICHLOROPHENOL	10 U	10 U	10 U	10 U	1 U	N/A	N/A
2,4-DIMETHYLPHENOL	10 U	10 U	10 U	10 U	1 U	N/A	N/A
2,4-DINITROPHENOL	25 U	25 UJ	25 U	25 U	5 UJ	N/A	N/A
2,4-DINITROTOLUENE	10 U	10 U	10 U	10 U	1 U	N/A	N/A
2,6-DINITROTOLUENE	10 U	10 U	10 U	10 U	1 U	N/A	N/A
2-CHLORONAPHTHALENE	10 U	10 U	10 U	10 U	1 U	N/A	N/A
2-CHLOROPHENOL	10 U	10 U	10 U	10 U	1 U	N/A	N/A

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-10	MW1-11A	MW1-11A	MW1-11A	MW1-11A	MW1-11C	MW1-11C
Sample ID:	149-S01-070	149-S01-010	149-S01-033	149-S01-051	149-S01-071	149-S01-011	149-S01-034
Sample Date:	08-FEB-99	22-MAY-98	20-AUG-98	06-NOV-98	08-FEB-99	04-JUN-98	20-AUG-98
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
PEST (ug/L)							
AROCLOR-1232	N/A	0.2 U	N/A	N/A	N/A	0.2 U	N/A
AROCLOR-1242	N/A	0.2 U	N/A	N/A	N/A	0.2 U	N/A
AROCLOR-1248	N/A	0.2 U	N/A	N/A	N/A	0.2 U	N/A
AROCLOR-1254	N/A	0.2 U	N/A	N/A	N/A	0.2 U	N/A
AROCLOR-1260	N/A	0.2 U	N/A	N/A	N/A	0.2 U	N/A
BETA-BHC	N/A	0.01 U	N/A	N/A	N/A	0.01 U	N/A
DELTA-BHC	N/A	0.01 U	N/A	N/A	N/A	0.01 U	N/A
DIELDRIN	N/A	0.02 U	N/A	N/A	N/A	0.02 U	N/A
ENDOSULFAN I	N/A	0.01 U	N/A	N/A	N/A	0.01 U	N/A
ENDOSULFAN II	N/A	0.02 U	N/A	N/A	N/A	0.02 U	N/A
ENDOSULFAN SULFATE	N/A	0.02 U	N/A	N/A	N/A	0.02 U	N/A
ENDRIN	N/A	0.02 U	N/A	N/A	N/A	0.02 U	N/A
ENDRIN ALDEHYDE	N/A	0.02 U	N/A	N/A	N/A	0.02 U	N/A
ENDRIN KETONE	N/A	0.02 U	N/A	N/A	N/A	0.02 U	N/A
GAMMA-BHC (LINDANE)	N/A	0.01 U	N/A	N/A	N/A	0.01 U	N/A
GAMMA-CHLORDANE	N/A	0.01 U	N/A	N/A	N/A	0.01 U	N/A
HEPTACHLOR	N/A	0.01 U	N/A	N/A	N/A	0.01 U	N/A
HEPTACHLOR EPOXIDE	N/A	0.01 U	N/A	N/A	N/A	0.01 U	N/A
METHOXYCHLOR	N/A	0.1 U	N/A	N/A	N/A	0.1 UJ	N/A
TOXAPHENE	N/A	1 U	N/A	N/A	N/A	1 U	N/A
SOLIDS (mg/L)							
TOTAL DISSOLVED SOLIDS	**18,600**	**7,400**	**9,270**	**18,000**	**22,500**	**240,000**	**39,100**
SVOA (ug/L)							
1,2,4-TRICHLOROBENZENE	N/A	1 U	N/A	N/A	N/A	1 U	N/A
1,2-DICHLOROBENZENE	N/A	1 U	N/A	N/A	N/A	1 U	N/A
1,3-DICHLOROBENZENE	N/A	1 U	N/A	N/A	N/A	1 U	N/A
1,4-DICHLOROBENZENE	N/A	1 U	N/A	N/A	N/A	1 U	N/A
2,2'-OXYBIS(1-CHLOROPROPANE)	N/A	1 U	N/A	N/A	N/A	1 U	N/A
2,4,5-TRICHLOROPHENOL	N/A	3 U	N/A	N/A	N/A	3 U	N/A
2,4,6-TRICHLOROPHENOL	N/A	2 U	N/A	N/A	N/A	2 U	N/A
2,4-DICHLOROPHENOL	N/A	1 U	N/A	N/A	N/A	1 U	N/A
2,4-DIMETHYLPHENOL	N/A	1 U	N/A	N/A	N/A	1 U	N/A
2,4-DINITROPHENOL	N/A	5 UJ	N/A	N/A	N/A	5 U	N/A
2,4-DINITROTOLUENE	N/A	1 U	N/A	N/A	N/A	1 U	N/A
2,6-DINITROTOLUENE	N/A	1 U	N/A	N/A	N/A	1 U	N/A
2-CHLORONAPHTHALENE	N/A	1 U	N/A	N/A	N/A	1 U	N/A
2-CHLOROPHENOL	N/A	1 U	N/A	N/A	N/A	1 U	N/A

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-11C	MW1-11C	MW1-12	MW1-12	MW1-12	MW1-12	MW1-13
Sample ID:	149-S01-052	149-S01-072	149-S01-012	149-S01-036	149-S01-053	149-S01-073	149-S01-014
Sample Date:	12-NOV-98	08-FEB-99	26-MAY-98	21-AUG-98	09-NOV-98	08-FEB-99	26-MAY-98
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	UPLAND
PEST (ug/L)							
AROCLOR-1232	N/A	N/A	0.2 U	N/A	N/A	N/A	0.2 U
AROCLOR-1242	N/A	N/A	0.2 U	N/A	N/A	N/A	0.2 U
AROCLOR-1248	N/A	N/A	0.2 U	N/A	N/A	N/A	0.2 U
AROCLOR-1254	N/A	N/A	0.2 U	N/A	N/A	N/A	0.2 U
AROCLOR-1260	N/A	N/A	0.2 U	N/A	N/A	N/A	0.2 U
BETA-BHC	N/A	N/A	0.01 U	N/A	N/A	N/A	0.01 U
DELTA-BHC	N/A	N/A	0.01 U	N/A	N/A	N/A	0.01 U
DIELDRIN	N/A	N/A	0.02 U	N/A	N/A	N/A	0.02 U
ENDOSULFAN I	N/A	N/A	0.01 U	N/A	N/A	N/A	0.01 U
ENDOSULFAN II	N/A	N/A	0.02 U	N/A	N/A	N/A	0.02 U
ENDOSULFAN SULFATE	N/A	N/A	0.02 U	N/A	N/A	N/A	0.02 U
ENDRIN	N/A	N/A	0.02 U	N/A	N/A	N/A	0.02 U
ENDRIN ALDEHYDE	N/A	N/A	0.02 U	N/A	N/A	N/A	0.02 U
ENDRIN KETONE	N/A	N/A	0.02 U	N/A	N/A	N/A	0.02 U
GAMMA-BHC (LINDANE)	N/A	N/A	0.01 U	N/A	N/A	N/A	0.01 U
GAMMA-CHLORDANE	N/A	N/A	0.01 U	N/A	N/A	N/A	0.01 U
HEPTACHLOR	N/A	N/A	0.01 U	N/A	N/A	N/A	0.01 U
HEPTACHLOR EPOXIDE	N/A	N/A	0.01 U	N/A	N/A	N/A	0.01 U
METHOXYCHLOR	N/A	N/A	0.1 U	N/A	N/A	N/A	0.1 UJ
TOXAPHENE	N/A	N/A	1 U	N/A	N/A	N/A	1 U
SOLIDS (mg/L)							
TOTAL DISSOLVED SOLIDS	**41,300**	**41,500**	**16,100** J	**18,200**	**19,200**	**16,500**	**7,100**
SVOA (ug/L)							
1,2,4-TRICHLOROBENZENE	N/A	N/A	1 U	1 U	1 U	4 U	1 U
1,2-DICHLOROBENZENE	N/A	N/A	1 U	1 U	1 U	4 U	**2**
1,3-DICHLOROBENZENE	N/A	N/A	1 U	1 U	1 U	4 U	1 U
1,4-DICHLOROBENZENE	N/A	N/A	1 U	1 U	1 U	4 U	**24**
2,2'-OXYBIS(1-CHLOROPROPANE)	N/A	N/A	1 U	1 U	1 U	4 U	1 U
2,4,5-TRICHLOROPHENOL	N/A	N/A	3 U	3 U	3 U	10 U	3 U
2,4,6-TRICHLOROPHENOL	N/A	N/A	2 U	2 U	1 U	4 U	2 U
2,4-DICHLOROPHENOL	N/A	N/A	1 U	1 U	1 U	4 U	1 U
2,4-DIMETHYLPHENOL	N/A	N/A	1 U	1 U	1 U	4 U	1 U
2,4-DINITROPHENOL	N/A	N/A	6 UJ	3 U	N/A	10 U	6 UJ
2,4-DINITROTOLUENE	N/A	N/A	1 U	1 U	1 U	4 U	1 U
2,6-DINITROTOLUENE	N/A	N/A	1 U	1 U	1 U	4 U	1 U
2-CHLORONAPHTHALENE	N/A	N/A	1 U	1 U	1 U	4 U	1 U
2-CHLOROPHENOL	N/A	N/A	1 U	1 U	1 U	4 U	1 U

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-13	MW1-13	MW1-13	MW1-2	MW1-2	MW1-2	MW1-2
Sample ID:	149-S01-037	149-S01-054	149-S01-074	273-S01-006	273-S01-007	273-S01-008	273-S01-009
Sample Date:	21-AUG-98	06-NOV-98	08-FEB-99	07-FEB-94	11-MAY-94	08-AUG-94	02-NOV-94
Screen Depth (feet bgs):							
ECO Habitat:	UPLAND	UPLAND	UPLAND	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
PEST (ug/L)							
AROCLOR-1232	N/A	N/A	N/A	1 UJ	1 UJ	1 UJ	0.5 UJ
AROCLOR-1242	N/A	N/A	N/A	1 UJ	1 UJ	1 UJ	0.5 UJ
AROCLOR-1248	N/A	N/A	N/A	1 UJ	1 UJ	1 UJ	0.5 UJ
AROCLOR-1254	N/A	N/A	N/A	1 UJ	1 UJ	1 UJ	0.5 UJ
AROCLOR-1260	N/A	N/A	N/A	1 UJ	1 UJ	1 UJ	0.5 UJ
BETA-BHC	N/A	N/A	N/A	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
DELTA-BHC	N/A	N/A	N/A	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
DIELDRIN	N/A	N/A	N/A	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
ENDOSULFAN I	N/A	N/A	N/A	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
ENDOSULFAN II	N/A	N/A	N/A	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
ENDOSULFAN SULFATE	N/A	N/A	N/A	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
ENDRIN	N/A	N/A	N/A	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
ENDRIN ALDEHYDE	N/A	N/A	N/A	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
ENDRIN KETONE	N/A	N/A	N/A	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
GAMMA-BHC (LINDANE)	N/A	N/A	N/A	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
GAMMA-CHLORDANE	N/A	N/A	N/A	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
HEPTACHLOR	N/A	N/A	N/A	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
HEPTACHLOR EPOXIDE	N/A	N/A	N/A	0.05 UJ	0.05 UJ	0.05 UJ	0.01 UJ
METHOXYCHLOR	N/A	N/A	N/A	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ
TOXAPHENE	N/A	N/A	N/A	5 UJ	5 UJ	5 UJ	3 UJ
SOLIDS (mg/L)							
TOTAL DISSOLVED SOLIDS	**7,870**	**6,580**	**6,910**	**1,800**	**1,800**	**1,820**	**2,220**
SVOA (ug/L)							
1,2,4-TRICHLOROBENZENE	1 U	1 U	4 U	10 U	10 U	10 U	10 U
1,2-DICHLOROBENZENE	**3**	**2**	**3** J	10 U	5 U	5 U	5 U
1,3-DICHLOROBENZENE	1 U	1 U	4 U	10 U	5 U	5 U	5 U
1,4-DICHLOROBENZENE	**10**	**17**	**17**	5 U	5 U	5 U	5 U
2,2'-OXYBIS(1-CHLOROPROPANE)	1 U	1 U	4 U	10 U	10 U	10 U	10 U
2,4,5-TRICHLOROPHENOL	3 U	3 U	10 U	25 U	25 U	25 U	25 U
2,4,6-TRICHLOROPHENOL	2 U	1 U	4 U	10 U	10 U	10 U	10 U
2,4-DICHLOROPHENOL	1 U	1 U	4 U	10 U	10 U	10 U	10 U
2,4-DIMETHYLPHENOL	1 U	1 U	4 U	10 U	10 U	10 U	10 U
2,4-DINITROPHENOL	3 U	N/A	10 U	25 U	25 UJ	25 U	25 U
2,4-DINITROTOLUENE	1 U	1 U	4 U	10 U	10 U	10 U	10 U
2,6-DINITROTOLUENE	1 U	1 U	4 U	10 U	10 U	10 U	10 U
2-CHLORONAPHTHALENE	1 U	1 U	4 U	10 U	10 U	10 U	10 U
2-CHLOROPHENOL	1 U	1 U	4 U	10 U	10 U	10 U	10 U

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-3	MW1-3	MW1-3	MW1-3	MW1-4	MW1-4	MW1-4
Sample ID:	273-S01-010	273-S01-011	273-S01-013	273-S01-014	273-S01-015	273-S01-016	273-S01-017
Sample Date:	07-FEB-94	10-MAY-94	02-AUG-94	31-OCT-94	06-FEB-94	11-MAY-94	08-AUG-94
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
PEST (ug/L)							
AROCLOR-1232	1 UJ	1 UJ	1 UJ	0.5 UJ	1 UJ	1 UJ	1 UJ
AROCLOR-1242	1 UJ	1 UJ	1 UJ	0.5 UJ	1 UJ	1 UJ	1 UJ
AROCLOR-1248	1 UJ	1 UJ	1 UJ	0.5 UJ	1 UJ	1 UJ	1 UJ
AROCLOR-1254	1 UJ	1 UJ	1 UJ	0.5 UJ	1 UJ	1 UJ	1 UJ
AROCLOR-1260	1 UJ	1 UJ	1 UJ	0.5 UJ	1 UJ	1 UJ	1 UJ
BETA-BHC	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
DELTA-BHC	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
DIELDRIN	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
ENDOSULFAN I	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
ENDOSULFAN II	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
ENDOSULFAN SULFATE	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
ENDRIN	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
ENDRIN ALDEHYDE	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
ENDRIN KETONE	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
GAMMA-BHC (LINDANE)	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
GAMMA-CHLORDANE	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
HEPTACHLOR	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
HEPTACHLOR EPOXIDE	0.05 UJ	0.05 UJ	0.05 UJ	0.01 UJ	0.05 UJ	0.05 UJ	0.05 UJ
METHOXYCHLOR	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ
TOXAPHENE	5 UJ	5 UJ	5 UJ	3 UJ	5 UJ	5 UJ	5 UJ
SOLIDS (mg/L)							
TOTAL DISSOLVED SOLIDS	**31,000**	**26,000**	**29,100**	**31,200**	**32,000**	**32,000**	**31,200**
SVOA (ug/L)							
1,2,4-TRICHLOROBENZENE	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
1,2-DICHLOROBENZENE	5 UJ	5 U	5 U	5 U	10 U	5 U	5 U
1,3-DICHLOROBENZENE	5 UJ	5 U	5 U	5 U	10 U	5 U	5 U
1,4-DICHLOROBENZENE	5 UJ	5 U	5 U	5 U	5 U	5 U	5 U
2,2'-OXYBIS(1-CHLOROPROPANE)	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
2,4,5-TRICHLOROPHENOL	25 UJ	25 U	25 U	25 U	25 U	25 U	25 U
2,4,6-TRICHLOROPHENOL	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
2,4-DICHLOROPHENOL	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
2,4-DIMETHYLPHENOL	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
2,4-DINITROPHENOL	25 UJ	25 U	25 U	25 U	25 UJ	25 UJ	25 U
2,4-DINITROTOLUENE	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
2,6-DINITROTOLUENE	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
2-CHLORONAPHTHALENE	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
2-CHLOROPHENOL	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-4	MW1-4	MW1-4	MW1-4	MW1-4	MW1-5R	MW1-5R
Sample ID:	273-S01-018	149-S01-015	149-S01-038	149-S01-056	149-S01-075	273-S01-028	273-S01-029
Sample Date:	02-NOV-94	21-MAY-98	24-AUG-98	09-NOV-98	09-FEB-99	06-FEB-94	03-MAY-94
Screen Depth (feet bgs):						7.0 to 17.0	7.0 to 17.0
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	UPLAND	UPLAND
PEST (ug/L)							
AROCLOR-1232	0.5 UJ	0.2 U	N/A	N/A	N/A	1 UJ	**1.1** J
AROCLOR-1242	0.5 UJ	0.2 U	N/A	N/A	N/A	1 UJ	1 UJ
AROCLOR-1248	0.5 UJ	0.2 U	N/A	N/A	N/A	1 UJ	1 UJ
AROCLOR-1254	0.5 UJ	0.2 U	N/A	N/A	N/A	1 UJ	1 UJ
AROCLOR-1260	0.5 UJ	0.2 U	N/A	N/A	N/A	1 UJ	1 UJ
BETA-BHC	0.05 UJ	0.01 U	N/A	N/A	N/A	0.05 UJ	0.05 UJ
DELTA-BHC	0.05 UJ	0.01 U	N/A	N/A	N/A	0.05 UJ	0.05 UJ
DIELDRIN	0.1 UJ	0.02 U	N/A	N/A	N/A	0.1 UJ	0.1 UJ
ENDOSULFAN I	0.05 UJ	0.01 U	N/A	N/A	N/A	0.05 UJ	0.05 UJ
ENDOSULFAN II	0.1 UJ	0.02 U	N/A	N/A	N/A	0.1 UJ	0.1 UJ
ENDOSULFAN SULFATE	0.1 UJ	0.02 U	N/A	N/A	N/A	0.1 UJ	0.1 UJ
ENDRIN	0.1 UJ	0.02 U	N/A	N/A	N/A	0.1 UJ	0.1 UJ
ENDRIN ALDEHYDE	0.1 UJ	0.02 U	N/A	N/A	N/A	0.1 UJ	0.1 UJ
ENDRIN KETONE	0.1 UJ	0.02 U	N/A	N/A	N/A	0.1 UJ	0.1 UJ
GAMMA-BHC (LINDANE)	0.05 UJ	0.01 U	N/A	N/A	N/A	0.05 UJ	0.05 UJ
GAMMA-CHLORDANE	0.05 UJ	0.01 U	N/A	N/A	N/A	0.05 UJ	0.05 UJ
HEPTACHLOR	0.05 UJ	0.01 U	N/A	N/A	N/A	0.05 UJ	0.05 UJ
HEPTACHLOR EPOXIDE	0.01 UJ	0.01 U	N/A	N/A	N/A	0.05 UJ	0.05 UJ
METHOXYCHLOR	0.5 UJ	0.1 U	N/A	N/A	N/A	0.5 UJ	0.5 UJ
TOXAPHENE	3 UJ	1 U	N/A	N/A	N/A	5 UJ	5 UJ
SOLIDS (mg/L)							
TOTAL DISSOLVED SOLIDS	**31,300**	**33,000** J	**34,500**	**32,500**	**33,700**	**10,000**	**9,700**
SVOA (ug/L)							
1,2,4-TRICHLOROBENZENE	10 U	1 U	1 U	1 UJ	1 UJ	20 U	10 U
1,2-DICHLOROBENZENE	5 U	1 U	1 U	1 UJ	1 U	10 U	5 U
1,3-DICHLOROBENZENE	5 U	1 U	1 U	1 UJ	1 U	10 U	5 U
1,4-DICHLOROBENZENE	5 U	1 U	1 U	1 UJ	1 U	10 U	**1** J
2,2'-OXYBIS(1-CHLOROPROPANE)	10 U	1 U	1 U	1 UJ	1 U	20 U	10 U
2,4,5-TRICHLOROPHENOL	25 U	3 U	2 U	3 UJ	3 U	50 U	25 U
2,4,6-TRICHLOROPHENOL	10 U	2 U	2 U	1 UJ	1 U	20 U	10 U
2,4-DICHLOROPHENOL	10 U	1 U	1 U	1 UJ	1 U	20 U	10 U
2,4-DIMETHYLPHENOL	10 U	1 U	1 U	1 UJ	1 U	20 U	10 U
2,4-DINITROPHENOL	N/A	6 UJ	2 UJ	N/A	3 U	50 U	25 UJ
2,4-DINITROTOLUENE	10 U	1 U	1 U	1 UJ	1 U	20 U	10 U
2,6-DINITROTOLUENE	10 U	1 U	1 U	1 UJ	1 U	20 U	10 U
2-CHLORONAPHTHALENE	10 U	1 U	1 U	1 UJ	1 U	20 U	10 U
2-CHLOROPHENOL	10 U	1 U	1 U	1 UJ	1 U	20 U	10 U

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-5R	MW1-5R	MW1-5R	MW1-5R	MW1-5R	MW1-5R	MW1-6
Sample ID:	273-S01-030	273-S01-031	149-S01-016	149-S01-039	149-S01-057	149-S01-077	273-S01-019
Sample Date:	02-AUG-94	31-OCT-94	26-MAY-98	21-AUG-98	09-NOV-98	09-FEB-99	06-FEB-94
Screen Depth (feet bgs):	7.0 to 17.0	7.0 to 17.0	7.0 to 17.0	7.0 to 17.0	7.0 to 17.0	7.0 to 17.0	
ECO Habitat:	UPLAND	UPLAND	UPLAND	UPLAND	UPLAND	UPLAND	TIDAL MARSH
PEST (ug/L)							
AROCLOR-1232	**1.2** J	0.5 UJ	0.2 U	N/A	N/A	N/A	1 UJ
AROCLOR-1242	1 UJ	0.5 UJ	0.2 U	N/A	N/A	N/A	1 UJ
AROCLOR-1248	1 UJ	0.5 UJ	0.2 U	N/A	N/A	N/A	1 UJ
AROCLOR-1254	1 UJ	0.5 UJ	0.2 U	N/A	N/A	N/A	1 UJ
AROCLOR-1260	1 UJ	0.5 UJ	0.2 U	N/A	N/A	N/A	1 UJ
BETA-BHC	0.05 UJ	0.05 UJ	0.01 U	N/A	N/A	N/A	0.05 UJ
DELTA-BHC	0.05 UJ	0.05 UJ	0.01 U	N/A	N/A	N/A	0.05 UJ
DIELDRIN	0.1 UJ	0.1 UJ	0.02 U	N/A	N/A	N/A	0.1 UJ
ENDOSULFAN I	0.05 UJ	0.05 UJ	0.01 U	N/A	N/A	N/A	0.05 UJ
ENDOSULFAN II	0.1 UJ	0.1 UJ	0.02 U	N/A	N/A	N/A	0.1 UJ
ENDOSULFAN SULFATE	0.1 UJ	0.1 UJ	0.02 U	N/A	N/A	N/A	0.1 UJ
ENDRIN	0.1 UJ	0.1 UJ	0.02 U	N/A	N/A	N/A	0.1 UJ
ENDRIN ALDEHYDE	0.1 UJ	0.1 UJ	0.02 U	N/A	N/A	N/A	0.1 UJ
ENDRIN KETONE	0.1 UJ	0.1 UJ	0.02 U	N/A	N/A	N/A	0.1 UJ
GAMMA-BHC (LINDANE)	0.05 UJ	0.05 UJ	0.01 U	N/A	N/A	N/A	0.05 UJ
GAMMA-CHLORDANE	0.05 UJ	0.05 UJ	0.01 U	N/A	N/A	N/A	0.05 UJ
HEPTACHLOR	0.05 UJ	0.05 UJ	0.01 U	N/A	N/A	N/A	0.05 UJ
HEPTACHLOR EPOXIDE	0.05 UJ	0.01 UJ	0.01 U	N/A	N/A	N/A	0.07 UJ
METHOXYCHLOR	0.5 UJ	0.5 UJ	0.1 UJ	N/A	N/A	N/A	0.5 UJ
TOXAPHENE	5 UJ	3 UJ	1 U	N/A	N/A	N/A	5 UJ
SOLIDS (mg/L)							
TOTAL DISSOLVED SOLIDS	**19,300**	**22,200**	**4,580**	**4,450**	**4,610**	**5,500**	**10,000**
SVOA (ug/L)							
1,2,4-TRICHLOROBENZENE	10 U	10 U	1 U	1 U	1 U	4 U	10 U
1,2-DICHLOROBENZENE	5 U	5 U	1 U	1 U	1 U	4 U	10 U
1,3-DICHLOROBENZENE	5 U	5 U	1 U	1 U	1 U	4 U	10 U
1,4-DICHLOROBENZENE	5 U	5 U	1 U	1 U	1 U	4 U	5 U
2,2'-OXYBIS(1-CHLOROPROPANE)	10 U	10 U	1 U	1 U	1 U	4 U	10 U
2,4,5-TRICHLOROPHENOL	25 U	25 U	3 U	3 U	3 U	10 U	25 U
2,4,6-TRICHLOROPHENOL	10 U	10 U	2 U	2 U	1 U	4 U	10 U
2,4-DICHLOROPHENOL	10 U	10 U	1 U	1 U	1 U	4 U	10 U
2,4-DIMETHYLPHENOL	10 U	10 U	1 U	1 U	1 U	4 U	10 U
2,4-DINITROPHENOL	25 U	25 U	5 UJ	3 U	N/A	10 U	25 UJ
2,4-DINITROTOLUENE	10 U	10 U	1 U	1 U	1 U	4 U	10 U
2,6-DINITROTOLUENE	10 U	10 U	1 U	1 U	1 U	4 U	10 U
2-CHLORONAPHTHALENE	10 U	10 U	1 U	1 U	1 U	4 U	10 U
2-CHLOROPHENOL	10 U	10 U	1 U	1 U	1 U	4 U	10 U

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-6	MW1-6	MW1-6	MW1-7	MW1-7	MW1-7	MW1-7
Sample ID:	273-S01-020	273-S01-021	273-S01-023	273-S01-024	273-S01-025	273-S01-026	273-S01-027
Sample Date:	03-MAY-94	02-AUG-94	31-OCT-94	06-FEB-94	11-MAY-94	08-AUG-94	02-NOV-94
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	UPLAND	UPLAND	UPLAND	UPLAND
PEST (ug/L)							
AROCLOR-1232	1 UJ	1 UJ	0.5 UJ	1 UJ	1 UJ	1 UJ	0.5 UJ
AROCLOR-1242	1 UJ	1 UJ	0.5 UJ	1 UJ	1 UJ	1 UJ	0.5 UJ
AROCLOR-1248	1 UJ	1 UJ	0.5 UJ	1 UJ	1 UJ	1 UJ	0.5 UJ
AROCLOR-1254	1 UJ	1 UJ	0.5 UJ	1 UJ	1 UJ	1 UJ	0.5 UJ
AROCLOR-1260	1 UJ	1 UJ	0.5 UJ	1 UJ	1 UJ	1 UJ	0.5 UJ
BETA-BHC	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
DELTA-BHC	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
DIELDRIN	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
ENDOSULFAN I	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
ENDOSULFAN II	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
ENDOSULFAN SULFATE	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
ENDRIN	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
ENDRIN ALDEHYDE	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
ENDRIN KETONE	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
GAMMA-BHC (LINDANE)	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
GAMMA-CHLORDANE	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
HEPTACHLOR	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
HEPTACHLOR EPOXIDE	0.05 UJ	0.05 UJ	0.01 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.01 UJ
METHOXYCHLOR	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ
TOXAPHENE	5 UJ	5 UJ	3 UJ	5 UJ	5 UJ	5 UJ	3 UJ
SOLIDS (mg/L)							
TOTAL DISSOLVED SOLIDS	**8,800**	**9,580**	**8,200**	**36,000**	**34,000**	**33,100**	**36,800**
SVOA (ug/L)							
1,2,4-TRICHLOROBENZENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-DICHLOROBENZENE	5 U	5 U	5 U	10 U	5 U	5 U	5 U
1,3-DICHLOROBENZENE	5 U	5 U	5 U	10 U	5 U	5 U	5 U
1,4-DICHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2,2'-OXYBIS(1-CHLOROPROPANE)	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4,5-TRICHLOROPHENOL	25 U	25 U	25 U	25 U	25 U	25 U	25 U
2,4,6-TRICHLOROPHENOL	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
2,4-DICHLOROPHENOL	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4-DIMETHYLPHENOL	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4-DINITROPHENOL	25 U	25 UJ	25 U	25 UJ	25 UJ	25 U	25 U
2,4-DINITROTOLUENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,6-DINITROTOLUENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-CHLORONAPHTHALENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-CHLOROPHENOL	10 U	10 U	10 U	10 U	10 U	10 U	10 U

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-8	MW1-8	MW1-8	MW1-8	MW1-8	MW1-8	MW1-8
Sample ID:	273-S01-124	273-S01-126	273-S01-128	273-S01-130	149-S01-017	149-S01-040	149-S01-058
Sample Date:	06-FEB-94	11-MAY-94	08-AUG-94	02-NOV-94	27-MAY-98	24-AUG-98	06-NOV-98
Screen Depth (feet bgs):	6.0 to 17.0	6.0 to 17.0	6.0 to 17.0	6.0 to 17.0	6.0 to 17.0	6.0 to 17.0	6.0 to 17.0
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
PEST (ug/L)							
AROCLOR-1232	1 UJ	1 UJ	1 UJ	0.5 UJ	0.2 U	N/A	N/A
AROCLOR-1242	1 UJ	1 UJ	1 UJ	0.5 UJ	0.2 U	N/A	N/A
AROCLOR-1248	1 UJ	1 UJ	1 UJ	0.5 UJ	0.2 U	N/A	N/A
AROCLOR-1254	1 UJ	1 UJ	1 UJ	0.5 UJ	0.2 U	N/A	N/A
AROCLOR-1260	1 UJ	1 UJ	1 UJ	0.5 UJ	0.2 U	N/A	N/A
BETA-BHC	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.01 U	N/A	N/A
DELTA-BHC	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.01 U	N/A	N/A
DIELDRIN	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.02 U	N/A	N/A
ENDOSULFAN I	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.01 U	N/A	N/A
ENDOSULFAN II	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.02 U	N/A	N/A
ENDOSULFAN SULFATE	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.02 U	N/A	N/A
ENDRIN	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.02 U	N/A	N/A
ENDRIN ALDEHYDE	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.02 U	N/A	N/A
ENDRIN KETONE	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.02 U	N/A	N/A
GAMMA-BHC (LINDANE)	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.01 U	N/A	N/A
GAMMA-CHLORDANE	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.01 U	N/A	N/A
HEPTACHLOR	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.01 U	N/A	N/A
HEPTACHLOR EPOXIDE	0.05 UJ	0.05 UJ	0.05 UJ	0.01 UJ	0.01 U	N/A	N/A
METHOXYCHLOR	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.1 U	N/A	N/A
TOXAPHENE	5 UJ	5 UJ	5 UJ	3 UJ	1 U	N/A	N/A
SOLIDS (mg/L)							
TOTAL DISSOLVED SOLIDS	**11,000**	**6,300**	**12,200**	**10,100**	**3,660**	**7,140**	**7,500**
SVOA (ug/L)							
1,2,4-TRICHLOROBENZENE	10 U	10 U	10 U	10 U	1 U	1 U	1 U
1,2-DICHLOROBENZENE	10 U	5 U	5 U	5 U	1 U	1 U	1 U
1,3-DICHLOROBENZENE	10 U	5 U	5 U	5 U	1 U	1 U	1 U
1,4-DICHLOROBENZENE	5 U	5 U	5 U	5 U	1 U	1 U	1 U
2,2'-OXYBIS(1-CHLOROPROPANE)	10 U	10 UJ	10 U	10 U	1 U	1 U	1 U
2,4,5-TRICHLOROPHENOL	25 U	25 U	25 U	25 U	3 U	3 U	3 U
2,4,6-TRICHLOROPHENOL	10 U	10 U	10 U	10 U	2 U	2 U	1 U
2,4-DICHLOROPHENOL	10 U	10 U	10 U	10 U	1 U	1 U	1 U
2,4-DIMETHYLPHENOL	10 U	10 U	10 U	10 U	1 U	1 U	1 U
2,4-DINITROPHENOL	25 UJ	25 U	25 UJ	25 U	5 UJ	3 UJ	N/A
2,4-DINITROTOLUENE	10 U	10 U	10 U	10 U	1 U	1 U	1 U
2,6-DINITROTOLUENE	10 U	10 U	10 U	10 U	1 U	1 U	1 U
2-CHLORONAPHTHALENE	10 U	10 U	10 U	10 U	1 U	1 U	1 U
2-CHLOROPHENOL	10 U	10 U	10 U	10 U	1 U	1 U	1 U

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW
Point Name:	MW1-8	MW1-9	MW1-9	MW1-9	MW1-9
Sample ID:	149-S01-078	273-S01-125	273-S01-127	273-S01-129	273-S01-131
Sample Date:	09-FEB-99	06-FEB-94	11-MAY-94	09-AUG-94	02-NOV-94
Screen Depth (feet bgs):	6.0 to 17.0	3.0 to 13.0	3.0 to 13.0	3.0 to 13.0	3.0 to 13.0
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
PEST (ug/L)					
AROCLOR-1232	N/A	1 U	1 UJ	1 UJ	0.5 UJ
AROCLOR-1242	N/A	1 U	1 UJ	1 UJ	0.5 UJ
AROCLOR-1248	N/A	1 UJ	1 UJ	1 UJ	0.5 UJ
AROCLOR-1254	N/A	1 UJ	1 UJ	1 UJ	0.5 UJ
AROCLOR-1260	N/A	1 UJ	1 UJ	1 UJ	0.5 UJ
BETA-BHC	N/A	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ
DELTA-BHC	N/A	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
DIELDRIN	N/A	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
ENDOSULFAN I	N/A	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
ENDOSULFAN II	N/A	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
ENDOSULFAN SULFATE	N/A	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
ENDRIN	N/A	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
ENDRIN ALDEHYDE	N/A	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
ENDRIN KETONE	N/A	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
GAMMA-BHC (LINDANE)	N/A	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ
GAMMA-CHLORDANE	N/A	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
HEPTACHLOR	N/A	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ
HEPTACHLOR EPOXIDE	N/A	0.05 UJ	0.05 UJ	0.05 UJ	0.01 UJ
METHOXYCHLOR	N/A	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ
TOXAPHENE	N/A	5 UJ	5 UJ	5 UJ	3 UJ
SOLIDS (mg/L)					
TOTAL DISSOLVED SOLIDS	**6,800**	**20,000**	**21,000**	**19,500**	**18,300**
SVOA (ug/L)					
1,2,4-TRICHLOROBENZENE	4 U	10 U	10 U	10 U	10 U
1,2-DICHLOROBENZENE	4 U	10 U	5 U	5 U	5 U
1,3-DICHLOROBENZENE	4 U	10 U	5 U	5 U	5 U
1,4-DICHLOROBENZENE	4 U	5 U	5 U	5 U	5 U
2,2'-OXYBIS(1-CHLOROPROPANE)	4 U	10 U	10 U	10 U	10 U
2,4,5-TRICHLOROPHENOL	10 U	25 U	25 U	25 U	25 U
2,4,6-TRICHLOROPHENOL	4 U	10 U	10 U	10 U	10 U
2,4-DICHLOROPHENOL	4 U	10 U	10 U	10 U	10 U
2,4-DIMETHYLPHENOL	4 U	10 U	10 U	10 U	10 U
2,4-DINITROPHENOL	10 U	25 UJ	25 U	25 UJ	25 U
2,4-DINITROTOLUENE	4 U	10 U	10 U	10 U	10 U
2,6-DINITROTOLUENE	4 U	10 U	10 U	10 U	10 U
2-CHLORONAPHTHALENE	4 U	10 U	10 U	10 U	10 U
2-CHLOROPHENOL	4 U	10 U	10 U	10 U	10 U

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-1	MW1-1	MW1-1	MW1-1	MW1-10	MW1-10	MW1-10
Sample ID:	273-S01-001	273-S01-003	273-S01-004	273-S01-005	149-S01-009	149-S01-032	149-S01-050
Sample Date:	07-FEB-94	03-MAY-94	02-AUG-94	31-OCT-94	21-MAY-98	20-AUG-98	09-NOV-98
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
SVOA (ug/L)							
2-METHYLNAPHTHALENE	10 U	10 U	10 U	10 U	1 U	N/A	N/A
2-METHYLPHENOL	10 U	10 U	10 U	10 U	1 U	N/A	N/A
2-NITROANILINE	25 U	25 U	25 U	25 U	3 U	N/A	N/A
2-NITROPHENOL	10 U	10 U	10 U	10 U	2 U	N/A	N/A
3,3'-DICHLOROBENZIDINE	10 U	10 U	10 U	10 U	2 U	N/A	N/A
3-NITROANILINE	25 UJ	25 U	25 U	25 U	3 U	N/A	N/A
4,6-DINITRO-2-METHYLPHENOL	25 U	25 U	25 U	25 U	3 UJ	N/A	N/A
4-BROMOPHENYL-PHENYLETHER	10 U	10 U	10 U	10 U	1 U	N/A	N/A
4-CHLORO-3-METHYLPHENOL	10 U	10 U	10 U	10 U	1 U	N/A	N/A
4-CHLOROANILINE	10 U	10 U	10 U	10 U	1 UJ	N/A	N/A
4-CHLOROPHENYL-PHENYLETHER	10 U	10 U	10 U	10 U	1 U	N/A	N/A
4-METHYLPHENOL	10 U	10 U	10 U	10 U	1 U	N/A	N/A
4-NITROANILINE	25 U	25 U	25 U	25 U	3 U	N/A	N/A
4-NITROPHENOL	25 U	25 U	25 U	25 UJ	5 U	N/A	N/A
ACENAPHTHENE	10 U	10 U	10 U	10 U	0.1 U	N/A	N/A
ACENAPHTHYLENE	10 U	10 U	10 U	10 U	0.1 U	N/A	N/A
ANTHRACENE	10 U	10 U	10 U	10 UJ	0.1 U	N/A	N/A
BENZO(A)ANTHRACENE	10 U	10 U	10 U	10 U	0.1 U	N/A	N/A
BENZO(A)PYRENE	10 U	10 U	10 U	10 U	0.1 U	N/A	N/A
BENZO(B)FLUORANTHENE	10 U	10 U	10 U	10 U	0.1 U	N/A	N/A
BENZO(G,H,I)PERYLENE	10 U	10 U	10 U	10 U	0.1 U	N/A	N/A
BENZO(K)FLUORANTHENE	10 UJ	10 U	10 U	10 U	0.1 U	N/A	N/A
BIS(2-CHLOROETHOXY)METHANE	10 U	10 U	10 U	10 U	1 U	N/A	N/A
BIS(2-CHLOROETHYL)ETHER	10 U	10 U	10 U	10 U	1 U	N/A	N/A
BIS(2-ETHYLHEXYL)PHTHALATE	10 U	4 UJ	4 U	4 U	3 UJ	N/A	N/A
BUTYLBENZYLPHTHALATE	10 U	10 UJ	10 U	10 U	1 U	N/A	N/A
CARBAZOLE	10 UJ	10 U	10 U	10 UJ	1 U	N/A	N/A
CHRYSENE	10 U	10 U	10 U	10 U	0.1 U	N/A	N/A
DI-N-BUTYLPHTHALATE	10 U	10 UJ	10 U	10 U	6 U	N/A	N/A
DI-N-OCTYLPHTHALATE	10 U	10 U	10 U	10 U	1 U	N/A	N/A
DIBENZO(A,H)ANTHRACENE	10 U	10 U	10 U	10 U	0.1 U	N/A	N/A
DIBENZOFURAN	10 U	10 U	10 U	10 U	1 U	N/A	N/A
DIETHYLPHTHALATE	10 U	10 U	10 U	10 U	1 U	N/A	N/A
DIMETHYLPHTHALATE	10 U	10 U	10 U	10 U	1 U	N/A	N/A
FLUORANTHENE	10 U	10 U	10 U	10 U	0.1 U	N/A	N/A
FLUORENE	10 U	10 U	10 U	10 U	0.1 U	N/A	N/A
HEXACHLOROBENZENE	10 U	10 U	10 U	10 U	1 U	N/A	N/A

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-10	MW1-11A	MW1-11A	MW1-11A	MW1-11A	MW1-11C	MW1-11C
Sample ID:	149-S01-070	149-S01-010	149-S01-033	149-S01-051	149-S01-071	149-S01-011	149-S01-034
Sample Date:	08-FEB-99	22-MAY-98	20-AUG-98	06-NOV-98	08-FEB-99	04-JUN-98	20-AUG-98
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
SVOA (ug/L)							
2-METHYLNAPHTHALENE	N/A	1 U	N/A	N/A	N/A	1 U	N/A
2-METHYLPHENOL	N/A	1 U	N/A	N/A	N/A	1 U	N/A
2-NITROANILINE	N/A	3 U	N/A	N/A	N/A	3 U	N/A
2-NITROPHENOL	N/A	2 U	N/A	N/A	N/A	2 U	N/A
3,3'-DICHLOROBENZIDINE	N/A	2 U	N/A	N/A	N/A	2 U	N/A
3-NITROANILINE	N/A	3 U	N/A	N/A	N/A	3 U	N/A
4,6-DINITRO-2-METHYLPHENOL	N/A	3 UJ	N/A	N/A	N/A	3 U	N/A
4-BROMOPHENYL-PHENYLETHER	N/A	1 U	N/A	N/A	N/A	1 U	N/A
4-CHLORO-3-METHYLPHENOL	N/A	1 U	N/A	N/A	N/A	1 U	N/A
4-CHLOROANILINE	N/A	1 UJ	N/A	N/A	N/A	1 U	N/A
4-CHLOROPHENYL-PHENYLETHER	N/A	1 U	N/A	N/A	N/A	1 U	N/A
4-METHYLPHENOL	N/A	1 U	N/A	N/A	N/A	1 U	N/A
4-NITROANILINE	N/A	3 U	N/A	N/A	N/A	3 U	N/A
4-NITROPHENOL	N/A	5 U	N/A	N/A	N/A	5 U	N/A
ACENAPHTHENE	N/A	0.1 U	N/A	N/A	N/A	0.1 U	N/A
ACENAPHTHYLENE	N/A	0.1 U	N/A	N/A	N/A	0.1 U	N/A
ANTHRACENE	N/A	0.1 U	N/A	N/A	N/A	0.1 U	N/A
BENZO(A)ANTHRACENE	N/A	0.1 U	N/A	N/A	N/A	0.1 U	N/A
BENZO(A)PYRENE	N/A	0.1 U	N/A	N/A	N/A	0.1 U	N/A
BENZO(B)FLUORANTHENE	N/A	0.1 U	N/A	N/A	N/A	0.1 U	N/A
BENZO(G,H,I)PERYLENE	N/A	0.1 U	N/A	N/A	N/A	0.1 U	N/A
BENZO(K)FLUORANTHENE	N/A	0.1 U	N/A	N/A	N/A	0.1 U	N/A
BIS(2-CHLOROETHOXY)METHANE	N/A	1 U	N/A	N/A	N/A	1 U	N/A
BIS(2-CHLOROETHYL)ETHER	N/A	1 U	N/A	N/A	N/A	1 U	N/A
BIS(2-ETHYLHEXYL)PHTHALATE	N/A	1 U	N/A	N/A	N/A	1 UJ	N/A
BUTYLBENZYLPHTHALATE	N/A	1 U	N/A	N/A	N/A	1 U	N/A
CARBAZOLE	N/A	1 U	N/A	N/A	N/A	1 U	N/A
CHRYSENE	N/A	0.1 U	N/A	N/A	N/A	0.1 U	N/A
DI-N-BUTYLPHTHALATE	N/A	13 UJ	N/A	N/A	N/A	6 U	N/A
DI-N-OCTYLPHTHALATE	N/A	1 U	N/A	N/A	N/A	1 U	N/A
DIBENZO(A,H)ANTHRACENE	N/A	0.1 U	N/A	N/A	N/A	0.1 U	N/A
DIBENZOFURAN	N/A	1 U	N/A	N/A	N/A	1 U	N/A
DIETHYLPHTHALATE	N/A	1 U	N/A	N/A	N/A	1 U	N/A
DIMETHYLPHTHALATE	N/A	1 U	N/A	N/A	N/A	1 U	N/A
FLUORANTHENE	N/A	0.1 U	N/A	N/A	N/A	0.1 U	N/A
FLUORENE	N/A	0.1 U	N/A	N/A	N/A	0.1 U	N/A
HEXACHLOROBENZENE	N/A	1 U	N/A	N/A	N/A	1 U	N/A

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-11C	MW1-11C	MW1-12	MW1-12	MW1-12	MW1-12	MW1-13
Sample ID:	149-S01-052	149-S01-072	149-S01-012	149-S01-036	149-S01-053	149-S01-073	149-S01-014
Sample Date:	12-NOV-98	08-FEB-99	26-MAY-98	21-AUG-98	09-NOV-98	08-FEB-99	26-MAY-98
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	UPLAND
SVOA (ug/L)							
2-METHYLNAPHTHALENE	N/A	N/A	1 U	1 U	1 U	4 U	1 U
2-METHYLPHENOL	N/A	N/A	1 U	1 U	1 U	4 U	1 U
2-NITROANILINE	N/A	N/A	3 U	3 U	3 U	10 U	3 U
2-NITROPHENOL	N/A	N/A	2 U	2 UJ	1 U	4 U	2 U
3,3'-DICHLOROBENZIDINE	N/A	N/A	2 U	2 U	1 UJ	4 U	2 U
3-NITROANILINE	N/A	N/A	3 U	3 UJ	3 U	10 U	3 U
4,6-DINITRO-2-METHYLPHENOL	N/A	N/A	3 UJ	3 U	N/A	10 U	3 UJ
4-BROMOPHENYL-PHENYLETHER	N/A	N/A	1 U	1 U	1 U	4 U	1 U
4-CHLORO-3-METHYLPHENOL	N/A	N/A	1 U	1 U	1 U	4 U	1 U
4-CHLOROANILINE	N/A	N/A	1 UJ	1 UJ	1 U	4 U	1 UJ
4-CHLOROPHENYL-PHENYLETHER	N/A	N/A	1 U	1 U	1 U	4 U	1 U
4-METHYLPHENOL	N/A	N/A	1 U	1 U	1 U	4 U	1 U
4-NITROANILINE	N/A	N/A	3 U	3 UJ	3 U	10 U	3 U
4-NITROPHENOL	N/A	N/A	5 U	5 U	3 U	10 U	5 U
ACENAPHTHENE	N/A	N/A	0.1 U	0.1 U	1 U	4 U	0.1 U
ACENAPHTHYLENE	N/A	N/A	0.1 U	0.1 U	1 U	4 U	0.1 U
ANTHRACENE	N/A	N/A	0.1 U	0.1 U	1 U	4 U	0.1 U
BENZO(A)ANTHRACENE	N/A	N/A	0.1 U	0.1 U	1 U	4 U	0.1 U
BENZO(A)PYRENE	N/A	N/A	0.1 U	0.1 U	1 U	4 U	0.1 UJ
BENZO(B)FLUORANTHENE	N/A	N/A	0.1 U	0.1 U	1 U	4 U	0.1 UJ
BENZO(G,H,I)PERYLENE	N/A	N/A	0.1 U	**0.2** J	1 U	4 U	0.1 UJ
BENZO(K)FLUORANTHENE	N/A	N/A	0.1 U	0.1 U	1 U	4 U	0.1 UJ
BIS(2-CHLOROETHOXY)METHANE	N/A	N/A	1 U	1 U	1 U	4 U	1 U
BIS(2-CHLOROETHYL)ETHER	N/A	N/A	1 U	1 U	1 U	4 U	1 U
BIS(2-ETHYLHEXYL)PHTHALATE	N/A	N/A	1 UJ	1 UJ	1 UJ	4 U	7 UJ
BUTYLBENZYLPHTHALATE	N/A	N/A	1 U	1 U	1 U	4 U	1 U
CARBAZOLE	N/A	N/A	1 U	1 UJ	1 U	4 U	1 U
CHRYSENE	N/A	N/A	0.1 U	0.1 U	1 U	4 U	0.1 U
DI-N-BUTYLPHTHALATE	N/A	N/A	8 UJ	1 UJ	1 UJ	4 U	24 UJ
DI-N-OCTYLPHTHALATE	N/A	N/A	1 U	1 U	1 U	4 U	1 UJ
DIBENZO(A,H)ANTHRACENE	N/A	N/A	0.1 U	0.1 UJ	1 U	4 U	0.1 UJ
DIBENZOFURAN	N/A	N/A	1 U	1 U	1 U	4 U	1 U
DIETHYLPHTHALATE	N/A	N/A	1 U	1 UJ	1 U	4 U	1 U
DIMETHYLPHTHALATE	N/A	N/A	1 U	1 U	1 U	4 U	1 U
FLUORANTHENE	N/A	N/A	0.1 U	0.1 U	1 U	4 U	0.1 U
FLUORENE	N/A	N/A	0.1 U	0.1 U	1 U	4 U	0.1 U
HEXACHLOROBENZENE	N/A	N/A	1 U	1 U	1 U	4 U	1 U

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-13	MW1-13	MW1-13	MW1-2	MW1-2	MW1-2	MW1-2
Sample ID:	149-S01-037	149-S01-054	149-S01-074	273-S01-006	273-S01-007	273-S01-008	273-S01-009
Sample Date:	21-AUG-98	06-NOV-98	08-FEB-99	07-FEB-94	11-MAY-94	08-AUG-94	02-NOV-94
Screen Depth (feet bgs):							
ECO Habitat:	UPLAND	UPLAND	UPLAND	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
SVOA (ug/L)							
2-METHYLNAPHTHALENE	1 U	1 U	4 U	10 U	10 U	10 U	10 U
2-METHYLPHENOL	1 U	1 U	4 U	10 U	10 U	10 U	10 U
2-NITROANILINE	3 U	3 U	10 U	25 U	25 U	25 U	25 U
2-NITROPHENOL	2 UJ	1 U	4 U	10 U	10 U	10 U	10 U
3,3'-DICHLOROBENZIDINE	2 U	1 UJ	4 U	10 U	10 U	10 U	10 U
3-NITROANILINE	3 UJ	3 U	10 U	25 UJ	25 U	25 U	25 U
4,6-DINITRO-2-METHYLPHENOL	3 U	N/A	10 U	25 U	25 U	25 U	25 U
4-BROMOPHENYL-PHENYLETHER	1 U	1 U	4 U	10 U	10 U	10 U	10 U
4-CHLORO-3-METHYLPHENOL	1 U	1 U	4 U	10 U	10 U	10 U	10 U
4-CHLOROANILINE	1 UJ	1 U	4 U	10 U	10 U	10 U	10 U
4-CHLOROPHENYL-PHENYLETHER	1 U	1 U	4 U	10 U	10 U	10 U	10 U
4-METHYLPHENOL	1 U	**0.2** J	**4** J	10 U	10 U	10 U	10 U
4-NITROANILINE	3 UJ	3 U	10 U	25 U	25 U	25 U	25 U
4-NITROPHENOL	5 U	3 U	10 U	25 U	25 U	25 U	25 UJ
ACENAPHTHENE	0.1 U	**0.3** J	4 U	10 U	10 U	10 U	10 U
ACENAPHTHYLENE	0.1 U	1 U	4 U	10 U	10 U	10 U	10 U
ANTHRACENE	0.1 U	1 U	4 U	10 U	10 U	10 U	10 U
BENZO(A)ANTHRACENE	0.1 U	1 U	4 U	10 U	10 U	10 U	10 U
BENZO(A)PYRENE	0.1 U	1 UJ	N/A	10 U	10 U	10 U	10 U
BENZO(B)FLUORANTHENE	0.1 U	1 UJ	N/A	10 U	10 U	10 U	10 U
BENZO(G,H,I)PERYLENE	**0.2** J	1 UJ	N/A	10 U	10 U	10 U	10 U
BENZO(K)FLUORANTHENE	0.1 U	1 UJ	N/A	10 UJ	10 U	10 U	10 U
BIS(2-CHLOROETHOXY)METHANE	1 U	1 U	4 U	10 U	10 U	10 U	10 U
BIS(2-CHLOROETHYL)ETHER	1 U	1 U	4 U	10 U	10 U	10 U	10 U
BIS(2-ETHYLHEXYL)PHTHALATE	1 UJ	1 UJ	4 U	10 U	4 U	4 UJ	4 UJ
BUTYLBENZYLPHTHALATE	1 U	1 UJ	4 U	10 U	10 U	10 U	10 U
CARBAZOLE	1 UJ	1 U	4 U	10 UJ	10 U	10 U	10 U
CHRYSENE	0.1 U	1 U	4 U	10 U	10 U	10 U	10 U
DI-N-BUTYLPHTHALATE	1 UJ	1 UJ	4 UJ	10 U	10 UJ	10 UJ	10 U
DI-N-OCTYLPHTHALATE	1 U	1 UJ	N/A	10 U	10 U	10 U	10 U
DIBENZO(A,H)ANTHRACENE	0.1 UJ	1 UJ	N/A	10 U	10 U	10 U	10 U
DIBENZOFURAN	1 U	1 U	4 U	10 U	10 U	10 U	10 U
DIETHYLPHTHALATE	2 UJ	6 UJ	4 UJ	10 U	10 U	10 U	10 U
DIMETHYLPHTHALATE	1 U	1 U	4 U	10 U	10 U	10 U	10 U
FLUORANTHENE	0.1 U	1 U	4 U	10 U	10 U	10 U	10 U
FLUORENE	0.1 U	1 U	4 U	10 U	10 U	10 U	10 U
HEXACHLOROBENZENE	1 U	1 U	4 U	10 U	10 U	10 U	10 U

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-3	MW1-3	MW1-3	MW1-3	MW1-4	MW1-4	MW1-4
Sample ID:	273-S01-010	273-S01-011	273-S01-013	273-S01-014	273-S01-015	273-S01-016	273-S01-017
Sample Date:	07-FEB-94	10-MAY-94	02-AUG-94	31-OCT-94	06-FEB-94	11-MAY-94	08-AUG-94
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
SVOA (ug/L)							
2-METHYLNAPHTHALENE	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
2-METHYLPHENOL	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
2-NITROANILINE	25 UJ	25 U	25 U	25 U	25 U	25 U	25 U
2-NITROPHENOL	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
3,3'-DICHLOROBENZIDINE	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
3-NITROANILINE	25 UJ	25 U	25 U	25 U	25 U	25 U	25 U
4,6-DINITRO-2-METHYLPHENOL	25 UJ	25 U	25 U	25 U	25 U	25 U	25 U
4-BROMOPHENYL-PHENYLETHER	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
4-CHLORO-3-METHYLPHENOL	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
4-CHLOROANILINE	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
4-CHLOROPHENYL-PHENYLETHER	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
4-METHYLPHENOL	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
4-NITROANILINE	25 UJ	25 U	25 U	25 U	25 U	25 U	25 U
4-NITROPHENOL	25 UJ	25 U	25 U	25 UJ	25 U	25 U	25 U
ACENAPHTHENE	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
ACENAPHTHYLENE	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
ANTHRACENE	10 UJ	10 U	10 U	10 UJ	10 U	10 U	10 U
BENZO(A)ANTHRACENE	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
BENZO(A)PYRENE	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
BENZO(B)FLUORANTHENE	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
BENZO(G,H,I)PERYLENE	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
BENZO(K)FLUORANTHENE	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
BIS(2-CHLOROETHOXY)METHANE	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
BIS(2-CHLOROETHYL)ETHER	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
BIS(2-ETHYLHEXYL)PHTHALATE	4 UJ	4 UJ	4 U	4 U	10 U	4 U	4 UJ
BUTYLBENZYLPHTHALATE	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
CARBAZOLE	10 UJ	10 U	10 U	10 UJ	10 U	10 U	10 U
CHRYSENE	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
DI-N-BUTYLPHTHALATE	10 UJ	10 UJ	10 U	10 U	10 U	10 UJ	10 UJ
DI-N-OCTYLPHTHALATE	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
DIBENZO(A,H)ANTHRACENE	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
DIBENZOFURAN	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
DIETHYLPHTHALATE	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
DIMETHYLPHTHALATE	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
FLUORANTHENE	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
FLUORENE	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
HEXACHLOROBENZENE	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-4	MW1-4	MW1-4	MW1-4	MW1-4	MW1-5R	MW1-5R
Sample ID:	273-S01-018	149-S01-015	149-S01-038	149-S01-056	149-S01-075	273-S01-028	273-S01-029
Sample Date:	02-NOV-94	21-MAY-98	24-AUG-98	09-NOV-98	09-FEB-99	06-FEB-94	03-MAY-94
Screen Depth (feet bgs):						7.0 to 17.0	7.0 to 17.0
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	UPLAND	UPLAND
SVOA (ug/L)							
2-METHYLNAPHTHALENE	10 U	1 U	1 U	1 UJ	1 U	20 U	10 U
2-METHYLPHENOL	10 U	1 U	1 U	1 UJ	1 U	20 U	10 U
2-NITROANILINE	25 U	3 U	2 U	3 UJ	3 U	50 U	25 U
2-NITROPHENOL	10 U	2 U	2 U	1 UJ	1 U	20 U	10 U
3,3'-DICHLOROBENZIDINE	10 U	2 U	2 U	1 UJ	1 U	20 U	10 U
3-NITROANILINE	25 U	3 U	2 U	3 UJ	3 U	50 U	25 U
4,6-DINITRO-2-METHYLPHENOL	25 UJ	3 UJ	2 U	N/A	3 U	50 U	25 U
4-BROMOPHENYL-PHENYLETHER	10 U	1 U	1 U	1 UJ	1 U	20 U	10 U
4-CHLORO-3-METHYLPHENOL	10 U	1 U	1 U	1 UJ	1 U	20 U	10 U
4-CHLOROANILINE	10 U	1 UJ	1 U	1 UJ	1 U	20 U	10 U
4-CHLOROPHENYL-PHENYLETHER	10 U	1 U	1 U	1 UJ	1 U	20 U	10 U
4-METHYLPHENOL	10 U	1 U	1 U	1 UJ	1 U	**1** J	10 U
4-NITROANILINE	25 U	3 U	2 U	3 UJ	3 U	50 U	25 U
4-NITROPHENOL	25 U	5 U	5 U	3 UJ	3 U	50 U	25 U
ACENAPHTHENE	10 U	0.1 U	0.1 U	1 UJ	1 UJ	**1** J	**1** J
ACENAPHTHYLENE	10 U	0.1 U	0.1 U	1 UJ	1 U	20 U	10 U
ANTHRACENE	10 U	0.1 U	0.1 U	1 UJ	1 U	20 U	10 U
BENZO(A)ANTHRACENE	10 U	0.1 U	0.1 U	1 UJ	1 U	20 U	10 U
BENZO(A)PYRENE	10 U	0.1 U	0.1 U	1 UJ	1 U	20 U	10 U
BENZO(B)FLUORANTHENE	10 U	0.1 U	0.1 U	1 UJ	1 U	20 U	10 U
BENZO(G,H,I)PERYLENE	10 U	0.1 U	0.1 U	1 UJ	1 U	20 U	10 U
BENZO(K)FLUORANTHENE	10 U	0.1 U	0.1 U	1 UJ	1 U	20 U	10 U
BIS(2-CHLOROETHOXY)METHANE	10 U	1 U	1 U	1 UJ	1 U	20 U	10 U
BIS(2-CHLOROETHYL)ETHER	10 U	1 U	1 U	1 UJ	1 U	20 U	10 U
BIS(2-ETHYLHEXYL)PHTHALATE	4 U	1 UJ	1 UJ	1 UJ	1 UJ	200 UJ	4 U
BUTYLBENZYLPHTHALATE	10 U	1 U	1 U	1 UJ	1 UJ	20 U	10 U
CARBAZOLE	10 U	1 U	1 U	1 UJ	1 U	20 U	10 U
CHRYSENE	10 U	0.1 U	0.1 U	1 UJ	1 U	20 U	10 U
DI-N-BUTYLPHTHALATE	10 U	6 U	1 UJ	1 UJ	1 UJ	20 U	10 UJ
DI-N-OCTYLPHTHALATE	10 U	1 U	1 U	1 UJ	1 U	20 UJ	10 U
DIBENZO(A,H)ANTHRACENE	10 U	0.1 U	0.1 U	1 UJ	1 U	20 U	10 U
DIBENZOFURAN	10 U	1 U	1 U	1 UJ	1 U	20 U	10 U
DIETHYLPHTHALATE	10 U	1 U	1 UJ	1 UJ	1 UJ	20 U	10 U
DIMETHYLPHTHALATE	10 U	1 U	1 U	1 UJ	1 U	20 U	10 U
FLUORANTHENE	10 U	0.1 U	0.1 U	1 UJ	1 U	20 U	10 U
FLUORENE	10 U	0.1 U	0.1 U	1 UJ	1 U	20 U	10 U
HEXACHLOROBENZENE	10 U	1 U	1 U	1 UJ	1 U	20 UJ	10 U

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-5R	MW1-5R	MW1-5R	MW1-5R	MW1-5R	MW1-5R	MW1-6
Sample ID:	273-S01-030	273-S01-031	149-S01-016	149-S01-039	149-S01-057	149-S01-077	273-S01-019
Sample Date:	02-AUG-94	31-OCT-94	26-MAY-98	21-AUG-98	09-NOV-98	09-FEB-99	06-FEB-94
Screen Depth (feet bgs):	7.0 to 17.0	7.0 to 17.0	7.0 to 17.0	7.0 to 17.0	7.0 to 17.0	7.0 to 17.0	
ECO Habitat:	UPLAND	UPLAND	UPLAND	UPLAND	UPLAND	UPLAND	TIDAL MARSH
SVOA (ug/L)							
2-METHYLNAPHTHALENE	10 U	10 U	1 U	1 U	1 U	4 U	10 U
2-METHYLPHENOL	10 U	10 U	1 U	1 U	1 U	4 U	10 U
2-NITROANILINE	25 U	25 U	3 U	3 U	3 U	10 U	25 U
2-NITROPHENOL	10 U	10 U	2 U	2 UJ	1 U	4 U	10 U
3,3'-DICHLOROBENZIDINE	10 U	10 U	2 U	2 U	1 UJ	4 U	10 U
3-NITROANILINE	25 U	25 U	3 U	3 UJ	3 U	10 U	25 U
4,6-DINITRO-2-METHYLPHENOL	25 U	25 U	3 UJ	3 U	N/A	10 U	25 U
4-BROMOPHENYL-PHENYLETHER	10 U	10 U	1 U	1 U	1 U	4 U	10 U
4-CHLORO-3-METHYLPHENOL	10 U	10 U	1 U	1 U	1 U	4 U	10 U
4-CHLOROANILINE	10 U	10 U	1 UJ	1 UJ	1 U	4 U	10 U
4-CHLOROPHENYL-PHENYLETHER	10 U	10 U	1 U	1 U	1 U	4 U	10 U
4-METHYLPHENOL	10 U	10 U	1 U	1 U	1 U	4 U	10 U
4-NITROANILINE	25 U	25 U	3 U	3 UJ	3 U	10 U	25 U
4-NITROPHENOL	25 U	25 UJ	5 U	5 U	3 U	10 U	25 U
ACENAPHTHENE	10 UJ	10 U	**0.6**	**0.2**	1 U	4 U	10 U
ACENAPHTHYLENE	10 U	10 U	0.1 U	0.1 U	1 U	4 U	10 U
ANTHRACENE	10 U	10 UJ	0.1 U	0.1 U	1 U	4 U	10 U
BENZO(A)ANTHRACENE	10 U	10 U	0.1 U	0.1 U	1 U	4 U	10 U
BENZO(A)PYRENE	10 U	10 U	0.1 U	0.1 U	1 U	4 U	10 U
BENZO(B)FLUORANTHENE	10 U	10 U	0.1 U	0.1 U	1 U	4 U	10 U
BENZO(G,H,I)PERYLENE	10 U	10 U	0.1 U	**0.1** J	1 U	4 U	10 U
BENZO(K)FLUORANTHENE	10 U	10 U	0.1 U	0.1 U	1 U	4 U	10 U
BIS(2-CHLOROETHOXY)METHANE	10 U	10 U	1 U	1 U	1 U	4 U	10 U
BIS(2-CHLOROETHYL)ETHER	10 U	10 U	1 U	1 U	1 U	4 U	10 U
BIS(2-ETHYLHEXYL)PHTHALATE	4 U	4 U	2 UJ	1 UJ	1 UJ	4 U	10 U
BUTYLBENZYLPHTHALATE	10 U	10 U	1 U	1 U	1 U	4 U	10 U
CARBAZOLE	10 U	10 UJ	1 U	1 UJ	1 U	4 U	10 U
CHRYSENE	10 U	10 U	0.1 U	0.1 U	1 U	4 U	10 U
DI-N-BUTYLPHTHALATE	10 U	10 U	15 UJ	1 UJ	1 U	4 UJ	10 U
DI-N-OCTYLPHTHALATE	10 U	10 U	1 U	1 U	1 U	4 U	10 U
DIBENZO(A,H)ANTHRACENE	10 U	10 U	0.1 U	0.1 UJ	1 U	4 U	10 U
DIBENZOFURAN	10 U	10 U	1 U	1 U	1 U	4 U	10 U
DIETHYLPHTHALATE	10 U	10 U	1 U	1 UJ	1 U	4 U	10 U
DIMETHYLPHTHALATE	10 U	10 U	1 U	1 U	1 U	4 U	10 U
FLUORANTHENE	10 U	10 U	0.1 U	0.1 U	1 U	4 U	10 U
FLUORENE	10 U	10 U	0.1 U	0.1 U	1 U	4 U	10 U
HEXACHLOROBENZENE	10 U	10 U	1 U	1 U	1 U	4 U	10 U

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-6	MW1-6	MW1-6	MW1-7	MW1-7	MW1-7	MW1-7
Sample ID:	273-S01-020	273-S01-021	273-S01-023	273-S01-024	273-S01-025	273-S01-026	273-S01-027
Sample Date:	03-MAY-94	02-AUG-94	31-OCT-94	06-FEB-94	11-MAY-94	08-AUG-94	02-NOV-94
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	UPLAND	UPLAND	UPLAND	UPLAND
SVOA (ug/L)							
2-METHYLNAPHTHALENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-METHYLPHENOL	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-NITROANILINE	25 U	25 U	25 U	25 U	25 U	25 U	25 U
2-NITROPHENOL	10 U	10 U	10 U	10 U	10 U	10 U	10 U
3,3'-DICHLOROBENZIDINE	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
3-NITROANILINE	25 U	25 U	25 U	25 U	25 U	25 U	25 U
4,6-DINITRO-2-METHYLPHENOL	25 U	25 UJ	25 U	25 U	25 U	25 U	25 U
4-BROMOPHENYL-PHENYLETHER	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-CHLORO-3-METHYLPHENOL	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-CHLOROANILINE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-CHLOROPHENYL-PHENYLETHER	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-METHYLPHENOL	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-NITROANILINE	25 U	25 U	25 U	25 U	25 U	25 U	25 U
4-NITROPHENOL	25 U	25 U	25 UJ	25 U	25 U	25 U	25 UJ
ACENAPHTHENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
ACENAPHTHYLENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
ANTHRACENE	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U
BENZO(A)ANTHRACENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
BENZO(A)PYRENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
BENZO(B)FLUORANTHENE	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
BENZO(G,H,I)PERYLENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
BENZO(K)FLUORANTHENE	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
BIS(2-CHLOROETHOXY)METHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
BIS(2-CHLOROETHYL)ETHER	10 U	10 U	10 U	10 U	10 U	10 U	10 U
BIS(2-ETHYLHEXYL)PHTHALATE	4 U	4 U	4 U	10 U	4 UJ	4 U	4 UJ
BUTYLBENZYLPHTHALATE	10 UJ	10 UJ	10 U	10 U	10 U	10 U	10 U
CARBAZOLE	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U
CHRYSENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
DI-N-BUTYLPHTHALATE	10 UJ	10 U	10 U	10 U	10 U	10 UJ	10 U
DI-N-OCTYLPHTHALATE	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
DIBENZO(A,H)ANTHRACENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
DIBENZOFURAN	10 U	10 U	10 U	10 U	10 U	10 U	10 U
DIETHYLPHTHALATE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
DIMETHYLPHTHALATE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
FLUORANTHENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
FLUORENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
HEXACHLOROBENZENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-8	MW1-8	MW1-8	MW1-8	MW1-8	MW1-8	MW1-8
Sample ID:	273-S01-124	273-S01-126	273-S01-128	273-S01-130	149-S01-017	149-S01-040	149-S01-058
Sample Date:	06-FEB-94	11-MAY-94	08-AUG-94	02-NOV-94	27-MAY-98	24-AUG-98	06-NOV-98
Screen Depth (feet bgs):	6.0 to 17.0	6.0 to 17.0	6.0 to 17.0	6.0 to 17.0	6.0 to 17.0	6.0 to 17.0	6.0 to 17.0
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
SVOA (ug/L)							
2-METHYLNAPHTHALENE	10 U	10 U	10 U	10 U	1 U	1 U	1 U
2-METHYLPHENOL	10 U	10 U	10 U	10 U	1 U	1 U	1 U
2-NITROANILINE	25 U	25 U	25 U	25 U	3 U	3 U	3 U
2-NITROPHENOL	10 U	10 U	10 U	10 U	2 U	2 U	1 U
3,3'-DICHLOROBENZIDINE	10 U	10 U	10 UJ	10 U	2 U	2 U	1 UJ
3-NITROANILINE	25 U	25 U	25 U	25 U	3 U	3 U	3 UJ
4,6-DINITRO-2-METHYLPHENOL	25 U	25 U	25 UJ	25 U	3 UJ	3 U	N/A
4-BROMOPHENYL-PHENYLETHER	10 U	10 U	10 U	10 U	1 U	1 U	1 U
4-CHLORO-3-METHYLPHENOL	10 U	10 U	10 U	10 U	1 U	1 U	1 U
4-CHLOROANILINE	10 U	10 U	10 U	10 U	1 UJ	1 U	1 U
4-CHLOROPHENYL-PHENYLETHER	10 U	10 U	10 U	10 U	1 U	1 U	1 U
4-METHYLPHENOL	10 U	10 U	10 U	10 U	1 U	1 U	1 U
4-NITROANILINE	25 U	25 U	25 UJ	25 U	3 U	3 U	3 U
4-NITROPHENOL	5 U	25 UJ	25 UJ	25 UJ	5 U	5 U	3 U
ACENAPHTHENE	10 U	10 U	10 U	10 U	0.1 U	0.1 U	1 U
ACENAPHTHYLENE	10 U	10 U	10 U	10 U	0.1 U	0.1 U	1 U
ANTHRACENE	10 U	10 UJ	10 U	10 U	0.1 U	0.1 U	1 U
BENZO(A)ANTHRACENE	10 U	10 U	10 U	10 U	0.1 U	0.1 U	1 U
BENZO(A)PYRENE	10 U	10 U	10 U	10 U	0.1 U	0.1 U	1 U
BENZO(B)FLUORANTHENE	10 U	10 U	10 UJ	10 U	0.1 U	0.1 U	1 U
BENZO(G,H,I)PERYLENE	10 U	10 U	10 U	10 U	0.1 U	0.1 U	1 U
BENZO(K)FLUORANTHENE	10 U	10 U	10 UJ	10 U	0.1 U	0.1 U	1 U
BIS(2-CHLOROETHOXY)METHANE	10 U	10 U	10 U	10 U	1 U	1 U	1 U
BIS(2-CHLOROETHYL)ETHER	10 U	10 U	10 U	10 U	1 U	1 U	1 U
BIS(2-ETHYLHEXYL)PHTHALATE	10 U	4 UJ	4 U	4 UJ	5 UJ	1 UJ	1 UJ
BUTYLBENZYLPHTHALATE	10 U	10 U	10 U	10 U	1 U	1 U	1 UJ
CARBAZOLE	10 U	10 U	10 U	10 U	1 U	1 U	1 U
CHRYSENE	10 U	10 U	10 U	10 U	0.1 U	0.1 U	1 U
DI-N-BUTYLPHTHALATE	10 U	10 UJ	10 UJ	10 U	**12**	1 UJ	1 UJ
DI-N-OCTYLPHTHALATE	10 U	10 U	10 UJ	10 U	1 U	1 U	1 U
DIBENZO(A,H)ANTHRACENE	10 U	10 U	10 U	10 U	0.1 U	0.1 U	1 U
DIBENZOFURAN	10 U	10 U	10 U	10 U	1 U	1 U	1 U
DIETHYLPHTHALATE	10 U	10 U	10 U	10 U	1 U	1 UJ	1 UJ
DIMETHYLPHTHALATE	10 U	10 U	10 U	10 U	1 U	1 U	1 U
FLUORANTHENE	10 U	10 U	10 U	10 U	0.1 U	0.1 U	1 U
FLUORENE	10 U	10 U	10 U	10 U	0.1 U	0.1 U	1 U
HEXACHLOROBENZENE	10 U	10 U	10 U	10 U	1 U	1 U	1 U

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW
Point Name:	MW1-8	MW1-9	MW1-9	MW1-9	MW1-9
Sample ID:	149-S01-078	273-S01-125	273-S01-127	273-S01-129	273-S01-131
Sample Date:	09-FEB-99	06-FEB-94	11-MAY-94	09-AUG-94	02-NOV-94
Screen Depth (feet bgs):	6.0 to 17.0	3.0 to 13.0	3.0 to 13.0	3.0 to 13.0	3.0 to 13.0
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
SVOA (ug/L)					
2-METHYLNAPHTHALENE	4 U	10 U	10 U	10 U	10 U
2-METHYLPHENOL	4 U	10 U	10 U	10 U	10 U
2-NITROANILINE	10 U	25 U	25 U	25 U	25 U
2-NITROPHENOL	4 U	10 U	10 U	10 U	10 U
3,3'-DICHLOROBENZIDINE	4 U	10 U	10 U	10 UJ	10 U
3-NITROANILINE	10 U	25 U	25 U	25 U	25 U
4,6-DINITRO-2-METHYLPHENOL	10 U	25 U	25 U	25 UJ	25 U
4-BROMOPHENYL-PHENYLETHER	4 U	10 U	10 U	10 U	10 U
4-CHLORO-3-METHYLPHENOL	4 U	10 U	10 U	10 U	10 U
4-CHLOROANILINE	4 U	10 U	10 U	10 U	10 U
4-CHLOROPHENYL-PHENYLETHER	4 U	10 U	10 U	10 U	10 U
4-METHYLPHENOL	4 U	10 U	10 U	10 U	10 U
4-NITROANILINE	10 U	25 U	25 U	25 UJ	25 U
4-NITROPHENOL	10 U	25 U	25 U	25 UJ	25 UJ
ACENAPHTHENE	4 U	10 U	10 U	10 U	10 U
ACENAPHTHYLENE	4 U	10 U	10 U	10 U	10 U
ANTHRACENE	4 U	10 U	10 U	10 U	10 U
BENZO(A)ANTHRACENE	4 U	10 U	10 U	10 U	10 U
BENZO(A)PYRENE	4 U	10 U	10 U	10 U	10 U
BENZO(B)FLUORANTHENE	4 U	10 U	10 U	10 UJ	10 U
BENZO(G,H,I)PERYLENE	4 U	10 U	10 U	10 U	10 U
BENZO(K)FLUORANTHENE	4 U	10 U	10 U	10 UJ	10 U
BIS(2-CHLOROETHOXY)METHANE	4 U	10 U	10 U	10 U	10 U
BIS(2-CHLOROETHYL)ETHER	4 U	10 U	10 U	10 U	10 U
BIS(2-ETHYLHEXYL)PHTHALATE	4 U	10 U	4 UJ	4 U	4 UJ
BUTYLBENZYLPHTHALATE	4 U	10 U	10 U	10 U	10 U
CARBAZOLE	4 U	10 U	10 U	10 U	10 U
CHRYSENE	4 U	10 U	10 U	10 U	10 U
DI-N-BUTYLPHTHALATE	4 U	10 U	10 UJ	10 UJ	10 U
DI-N-OCTYLPHTHALATE	4 U	10 U	10 U	10 UJ	10 U
DIBENZO(A,H)ANTHRACENE	4 U	10 U	10 U	10 U	10 U
DIBENZOFURAN	4 U	10 U	10 U	10 U	10 U
DIETHYLPHTHALATE	4 U	10 U	10 U	10 U	10 U
DIMETHYLPHTHALATE	4 U	10 U	10 U	10 U	10 U
FLUORANTHENE	4 U	10 U	10 U	10 U	10 U
FLUORENE	4 U	10 U	10 U	10 U	10 U
HEXACHLOROBENZENE	4 U	10 U	10 U	10 U	10 U

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-1	MW1-1	MW1-1	MW1-1	MW1-10	MW1-10	MW1-10
Sample ID:	273-S01-001	273-S01-003	273-S01-004	273-S01-005	149-S01-009	149-S01-032	149-S01-050
Sample Date:	07-FEB-94	03-MAY-94	02-AUG-94	31-OCT-94	21-MAY-98	20-AUG-98	09-NOV-98
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
SVOA (ug/L)							
HEXACHLOROBUTADIENE	10 U	10 U	10 U	10 U	1 U	N/A	N/A
HEXACHLOROCYCLOPENTADIENE	10 U	10 U	10 U	10 UJ	1 UJ	N/A	N/A
HEXACHLOROETHANE	10 U	10 U	10 U	10 U	1 U	N/A	N/A
INDENO(1,2,3-CD)PYRENE	10 UJ	10 U	10 U	10 U	0.1 U	N/A	N/A
ISOPHORONE	10 U	10 U	10 U	10 U	1 U	N/A	N/A
N-NITROSO-DI-N-PROPYLAMINE	10 U	10 U	10 U	10 U	1 U	N/A	N/A
N-NITROSODIPHENYLAMINE	10 U	10 U	10 U	10 U	1 U	N/A	N/A
NAPHTHALENE	10 U	10 U	10 U	10 U	0.1 U	N/A	N/A
NITROBENZENE	10 U	10 U	10 U	10 U	1 U	N/A	N/A
PENTACHLOROPHENOL	25 U	25 UJ	25 U	25 UJ	5 U	N/A	N/A
PHENANTHRENE	10 U	10 U	10 U	10 U	0.1 U	N/A	N/A
PHENOL	10 U	10 U	10 U	10 U	1 U	N/A	N/A
PYRENE	10 U	10 U	10 U	10 U	0.1 U	N/A	N/A
VOA (ug/L)							
1,1,1-TRICHLOROETHANE	1 U	1 U	1 U	1 U	2 U	2 UJ	2 U
1,1,2,2-TETRACHLOROETHANE	1 U	1 U	1 U	1 U	2 U	2 UJ	2 U
1,1,2-TRICHLOROETHANE	1 U	1 U	1 U	1 U	2 U	2 UJ	2 U
1,1-DICHLOROETHANE	1 U	1 U	1 U	1 U	2 U	2 UJ	2 U
1,1-DICHLOROETHENE	1 U	1 U	1 U	1 U	2 U	2 UJ	2 UJ
1,2-DICHLOROETHANE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 U
1,2-DICHLOROETHENE (TOTAL)	1 U	1 U	1 U	1 U	N/A	N/A	2 U
1,2-DICHLOROPROPANE	1 U	1 U	1 U	1 U	2 U	2 UJ	2 U
2-BUTANONE	2 U	N/A	N/A	N/A	2 U	2 UJ	2 U
2-HEXANONE	2 U	2 U	N/A	2 U	2 U	2 UJ	2 U
4-METHYL-2-PENTANONE	2 U	2 U	2 U	2 U	2 UJ	2 UJ	2 U
ACETONE	2 UJ	10 UJ	N/A	N/A	2 UJ	2 UJ	2 U
BENZENE	1 U	1 U	1 U	1 U	2 U	2 UJ	2 U
BROMODICHLOROMETHANE	1 U	1 U	1 U	1 U	2 U	2 UJ	2 U
BROMOFORM	1 U	1 U	1 U	1 U	2 U	2 UJ	2 U
BROMOMETHANE	2 U	2 U	2 U	2 U	2 U	2 UJ	2 U
CARBON DISULFIDE	1 U	1 U	1 U	1 U	2 U	2 UJ	2 U
CARBON TETRACHLORIDE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U
CHLOROBENZENE	1 U	1 U	1 U	1 U	2 U	2 UJ	2 U
CHLOROETHANE	2 U	2 U	2 U	2 U	2 U	2 UJ	2 U
CHLOROFORM	1 U	1 U	1 U	1 U	2 U	2 UJ	2 U
CHLOROMETHANE	2 U	2 U	2 UJ	2 UJ	2 U	2 UJ	2 UJ
CIS-1,2-DICHLOROETHENE	N/A	N/A	N/A	N/A	2 U	2 UJ	N/A

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-10	MW1-11A	MW1-11A	MW1-11A	MW1-11A	MW1-11C	MW1-11C
Sample ID:	149-S01-070	149-S01-010	149-S01-033	149-S01-051	149-S01-071	149-S01-011	149-S01-034
Sample Date:	08-FEB-99	22-MAY-98	20-AUG-98	06-NOV-98	08-FEB-99	04-JUN-98	20-AUG-98
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
SVOA (ug/L)							
HEXACHLOROBUTADIENE	N/A	1 U	N/A	N/A	N/A	1 U	N/A
HEXACHLOROCYCLOPENTADIENE	N/A	1 UJ	N/A	N/A	N/A	1 U	N/A
HEXACHLOROETHANE	N/A	1 U	N/A	N/A	N/A	1 U	N/A
INDENO(1,2,3-CD)PYRENE	N/A	0.1 U	N/A	N/A	N/A	0.1 U	N/A
ISOPHORONE	N/A	1 U	N/A	N/A	N/A	1 U	N/A
N-NITROSO-DI-N-PROPYLAMINE	N/A	1 U	N/A	N/A	N/A	1 U	N/A
N-NITROSODIPHENYLAMINE	N/A	1 U	N/A	N/A	N/A	1 U	N/A
NAPHTHALENE	N/A	0.1 U	N/A	N/A	N/A	0.1 U	N/A
NITROBENZENE	N/A	1 U	N/A	N/A	N/A	1 U	N/A
PENTACHLOROPHENOL	N/A	5 U	N/A	N/A	N/A	5 U	N/A
PHENANTHRENE	N/A	0.1 U	N/A	N/A	N/A	0.1 U	N/A
PHENOL	N/A	1 U	N/A	N/A	N/A	1 U	N/A
PYRENE	N/A	0.1 U	N/A	N/A	N/A	0.1 U	N/A
VOA (ug/L)							
1,1,1-TRICHLOROETHANE	10 U	2 U	2 UJ	2 U	10 U	2 UJ	2 UJ
1,1,2,2-TETRACHLOROETHANE	10 U	2 U	2 UJ	2 U	10 U	2 UJ	2 UJ
1,1,2-TRICHLOROETHANE	10 U	2 U	2 UJ	2 U	10 U	2 UJ	2 UJ
1,1-DICHLOROETHANE	10 U	2 U	2 UJ	2 U	10 U	2 UJ	2 UJ
1,1-DICHLOROETHENE	10 U	2 U	2 UJ	2 U	10 U	2 UJ	2 UJ
1,2-DICHLOROETHANE	3 U	0.5 UJ	0.5 UJ	0.5 U	3 U	0.5 UJ	0.5 UJ
1,2-DICHLOROETHENE (TOTAL)	10 U	N/A	N/A	2 UJ	10 U	N/A	N/A
1,2-DICHLOROPROPANE	10 U	2 U	2 UJ	2 U	10 U	2 UJ	2 UJ
2-BUTANONE	10 UJ	2 U	2 UJ	2 U	10 U	2 UJ	2 UJ
2-HEXANONE	10 UJ	2 U	2 UJ	2 UJ	10 U	2 UJ	2 UJ
4-METHYL-2-PENTANONE	10 UJ	2 UJ	2 UJ	2 U	10 U	2 UJ	2 UJ
ACETONE	28 UJ	2 UJ	2 UJ	2 UJ	20 UJ	2 UJ	2 UJ
BENZENE	3 U	2 U	2 UJ	2 U	3 U	2 UJ	2 UJ
BROMODICHLOROMETHANE	10 U	2 U	2 UJ	2 U	10 U	2 UJ	2 UJ
BROMOFORM	10 U	2 U	2 UJ	2 U	10 U	2 UJ	2 UJ
BROMOMETHANE	10 U	2 U	2 UJ	2 U	10 U	2 UJ	2 UJ
CARBON DISULFIDE	10 U	2 U	**1** J	2 UJ	10 U	**2** J	**1** J
CARBON TETRACHLORIDE	3 U	0.5 U	0.5 UJ	0.5 U	3 U	0.5 UJ	0.5 UJ
CHLOROBENZENE	10 U	2 U	2 UJ	2 U	10 U	2 UJ	2 UJ
CHLOROETHANE	10 U	2 U	2 UJ	2 U	10 U	2 UJ	2 UJ
CHLOROFORM	10 U	2 U	2 UJ	2 U	10 U	2 UJ	2 UJ
CHLOROMETHANE	10 UJ	2 U	2 UJ	2 U	10 U	2 UJ	2 UJ
CIS-1,2-DICHLOROETHENE	N/A	2 U	2 UJ	N/A	N/A	2 UJ	2 UJ

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-11C	MW1-11C	MW1-12	MW1-12	MW1-12	MW1-12	MW1-13
Sample ID:	149-S01-052	149-S01-072	149-S01-012	149-S01-036	149-S01-053	149-S01-073	149-S01-014
Sample Date:	12-NOV-98	08-FEB-99	26-MAY-98	21-AUG-98	09-NOV-98	08-FEB-99	26-MAY-98
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	UPLAND
SVOA (ug/L)							
HEXACHLOROBUTADIENE	N/A	N/A	1 U	1 U	1 U	4 U	1 U
HEXACHLOROCYCLOPENTADIENE	N/A	N/A	1 UJ	1 UJ	1 UJ	4 U	1 UJ
HEXACHLOROETHANE	N/A	N/A	1 U	1 U	1 U	4 U	1 U
INDENO(1,2,3-CD)PYRENE	N/A	N/A	0.1 U	**0.2** J	1 U	4 U	0.1 UJ
ISOPHORONE	N/A	N/A	1 U	1 U	1 U	4 U	1 U
N-NITROSO-DI-N-PROPYLAMINE	N/A	N/A	1 U	1 U	1 U	4 U	1 U
N-NITROSODIPHENYLAMINE	N/A	N/A	1 U	1 U	1 U	4 U	1 U
NAPHTHALENE	N/A	N/A	0.2 U	0.1 U	1 U	4 U	**3**
NITROBENZENE	N/A	N/A	1 U	1 U	1 U	4 U	1 U
PENTACHLOROPHENOL	N/A	N/A	5 U	6 U	3 U	10 U	**3**
PHENANTHRENE	N/A	N/A	0.1 U	0.1 U	1 U	4 U	0.1 U
PHENOL	N/A	N/A	1 U	1 U	1 U	4 U	1 U
PYRENE	N/A	N/A	0.1 U	0.1 U	1 U	4 U	0.1 U
VOA (ug/L)							
1,1,1-TRICHLOROETHANE	2 U	20 U	2 U	2 U	2 U	50 U	2 U
1,1,2,2-TETRACHLOROETHANE	2 U	20 U	2 UJ	2 UJ	2 U	50 U	2 UJ
1,1,2-TRICHLOROETHANE	2 U	20 U	2 U	2 UJ	2 U	50 U	2 U
1,1-DICHLOROETHANE	2 U	20 U	2 U	**0.2** J	2 U	50 U	2 U
1,1-DICHLOROETHENE	2 U	20 U	2 U	2 U	2 UJ	50 U	2 U
1,2-DICHLOROETHANE	0.5 U	5 U	0.5 UJ	0.5 U	0.5 U	13 U	2 UJ
1,2-DICHLOROETHENE (TOTAL)	2 U	20 U	N/A	N/A	2 U	50 U	N/A
1,2-DICHLOROPROPANE	2 U	20 U	2 U	2 U	2 U	50 U	2 U
2-BUTANONE	2 U	20 U	2 U	2 U	2 U	50 U	2 U
2-HEXANONE	2 U	20 U	2 UJ	2 UJ	2 U	50 U	2 UJ
4-METHYL-2-PENTANONE	2 U	20 U	2 UJ	2 UJ	2 U	50 U	2 UJ
ACETONE	2 U	39 UJ	2 UJ	2 UJ	2 U	99 UJ	5 UJ
BENZENE	2 U	5 U	2 U	2 U	2 U	13 U	**10**
BROMODICHLOROMETHANE	2 U	20 U	2 U	2 U	2 U	50 U	2 U
BROMOFORM	2 U	20 U	2 U	2 UJ	2 U	50 U	2 U
BROMOMETHANE	2 U	20 U	2 U	2 UJ	2 U	50 U	2 U
CARBON DISULFIDE	2 U	20 U	2 U	2 U	2 U	50 U	**0.6** J
CARBON TETRACHLORIDE	0.5 U	5 U	0.5 U	0.5 U	0.5 U	13 U	0.5 U
CHLOROBENZENE	2 U	20 U	2 U	2 U	2 U	50 U	**12**
CHLOROETHANE	2 U	20 U	2 U	2 U	2 U	50 U	**7**
CHLOROFORM	2 U	20 U	2 U	2 U	2 U	50 U	2 U
CHLOROMETHANE	2 U	20 U	2 U	2 U	2 UJ	50 U	2 U
CIS-1,2-DICHLOROETHENE	N/A	N/A	2 U	2 U	N/A	N/A	2 U

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-13	MW1-13	MW1-13	MW1-2	MW1-2	MW1-2	MW1-2
Sample ID:	149-S01-037	149-S01-054	149-S01-074	273-S01-006	273-S01-007	273-S01-008	273-S01-009
Sample Date:	21-AUG-98	06-NOV-98	08-FEB-99	07-FEB-94	11-MAY-94	08-AUG-94	02-NOV-94
Screen Depth (feet bgs):							
ECO Habitat:	UPLAND	UPLAND	UPLAND	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
SVOA (ug/L)							
HEXACHLOROBUTADIENE	1 U	1 U	4 U	10 U	10 U	10 U	10 U
HEXACHLOROCYCLOPENTADIENE	1 UJ	1 UJ	4 U	10 U	10 U	10 U	10 U
HEXACHLOROETHANE	1 U	1 U	4 U	10 U	10 U	10 U	10 U
INDENO(1,2,3-CD)PYRENE	**0.2** J	1 UJ	N/A	10 UJ	10 U	10 U	10 U
ISOPHORONE	1 U	1 U	4 U	10 U	10 U	10 U	10 U
N-NITROSO-DI-N-PROPYLAMINE	1 U	1 U	4 U	10 U	10 U	10 U	10 UJ
N-NITROSODIPHENYLAMINE	1 U	**0.4** J	4 U	10 U	10 U	10 U	10 U
NAPHTHALENE	**1**	**0.4** J	4 U	10 U	10 U	10 U	10 U
NITROBENZENE	1 U	1 U	4 U	10 U	10 U	10 U	10 U
PENTACHLOROPHENOL	5 U	N/A	10 U	25 U	25 U	25 U	25 U
PHENANTHRENE	0.1 U	1 U	4 U	10 U	10 U	10 U	10 U
PHENOL	1 U	1 U	4 U	10 U	10 U	10 U	10 U
PYRENE	0.1 U	1 U	4 U	10 U	10 U	10 U	10 U
VOA (ug/L)							
1,1,1-TRICHLOROETHANE	2 U	2 U	20 U	1 U	1 U	1 U	1 U
1,1,2,2-TETRACHLOROETHANE	2 UJ	2 U	20 U	1 U	1 U	1 U	1 U
1,1,2-TRICHLOROETHANE	2 UJ	2 U	20 U	1 U	1 U	1 U	1 U
1,1-DICHLOROETHANE	**2** J	**1** J	20 U	1 U	1 U	1 U	1 U
1,1-DICHLOROETHENE	2 U	2 U	20 U	1 U	1 U	1 U	1 U
1,2-DICHLOROETHANE	**1**	**3**	5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DICHLOROETHENE (TOTAL)	N/A	2 UJ	20 U	1 U	1 U	1 U	1 U
1,2-DICHLOROPROPANE	2 U	2 U	20 U	1 U	1 U	1 U	1 U
2-BUTANONE	2 U	4 UJ	20 UJ	2 U	N/A	N/A	N/A
2-HEXANONE	2 UJ	2 UJ	20 U	2 U	2 U	2 U	2 UJ
4-METHYL-2-PENTANONE	2 UJ	2 UJ	20 U	2 U	2 U	2 U	2 UJ
ACETONE	2 UJ	4 UJ	45 UJ	2 UJ	N/A	N/A	N/A
BENZENE	**11**	**5**	**7**	1 U	1 U	1 U	1 U
BROMODICHLOROMETHANE	2 U	2 U	20 U	1 U	1 U	1 U	1 U
BROMOFORM	2 UJ	2 U	20 U	1 U	1 U	1 U	1 U
BROMOMETHANE	2 UJ	2 U	20 U	2 U	2 U	2 U	2 U
CARBON DISULFIDE	2 U	2 UJ	20 U	1 U	1 U	1 U	1 U
CARBON TETRACHLORIDE	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLOROBENZENE	**6**	**9**	**8** J	1 U	1 U	1 U	1 U
CHLOROETHANE	**4**	**10**	**5** J	2 U	2 U	2 U	2 U
CHLOROFORM	2 U	2 U	20 U	1 U	1 U	1 U	1 U
CHLOROMETHANE	2 U	2 U	**5** J	2 U	2 U	2 UJ	2 U
CIS-1,2-DICHLOROETHENE	**0.3** J	N/A	N/A	N/A	N/A	N/A	N/A

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-3	MW1-3	MW1-3	MW1-3	MW1-4	MW1-4	MW1-4
Sample ID:	273-S01-010	273-S01-011	273-S01-013	273-S01-014	273-S01-015	273-S01-016	273-S01-017
Sample Date:	07-FEB-94	10-MAY-94	02-AUG-94	31-OCT-94	06-FEB-94	11-MAY-94	08-AUG-94
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
SVOA (ug/L)							
HEXACHLOROBUTADIENE	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
HEXACHLOROCYCLOPENTADIENE	10 UJ	10 U	10 U	10 UJ	10 UJ	10 U	10 U
HEXACHLOROETHANE	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
INDENO(1,2,3-CD)PYRENE	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
ISOPHORONE	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
N-NITROSO-DI-N-PROPYLAMINE	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
N-NITROSODIPHENYLAMINE	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
NAPHTHALENE	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
NITROBENZENE	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
PENTACHLOROPHENOL	25 UJ	25 U	25 U	25 UJ	25 UJ	25 U	25 U
PHENANTHRENE	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
PHENOL	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
PYRENE	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
VOA (ug/L)							
1,1,1-TRICHLOROETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-TETRACHLOROETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-TRICHLOROETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-DICHLOROETHANE	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U
1,1-DICHLOROETHENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-DICHLOROETHANE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DICHLOROETHENE (TOTAL)	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-DICHLOROPROPANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-BUTANONE	N/A	N/A	15 UJ	N/A	2 U	N/A	N/A
2-HEXANONE	N/A	2 U	N/A	2 U	2 U	2 U	2 U
4-METHYL-2-PENTANONE	2 U	2 U	2 U	2 U	2 U	2 U	2 U
ACETONE	20 UJ	N/A	N/A	N/A	2 UJ	N/A	N/A
BENZENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U
BROMODICHLOROMETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U
BROMOFORM	1 U	1 U	1 U	1 U	1 U	1 U	1 U
BROMOMETHANE	2 U	2 U	2 U	2 U	2 U	2 U	2 U
CARBON DISULFIDE	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CARBON TETRACHLORIDE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLOROBENZENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CHLOROETHANE	2 U	2 U	2 U	2 U	2 U	2 U	2 U
CHLOROFORM	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CHLOROMETHANE	2 U	2 U	2 UJ	2 UJ	2 U	2 U	2 UJ
CIS-1,2-DICHLOROETHENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-4	MW1-4	MW1-4	MW1-4	MW1-4	MW1-5R	MW1-5R
Sample ID:	273-S01-018	149-S01-015	149-S01-038	149-S01-056	149-S01-075	273-S01-028	273-S01-029
Sample Date:	02-NOV-94	21-MAY-98	24-AUG-98	09-NOV-98	09-FEB-99	06-FEB-94	03-MAY-94
Screen Depth (feet bgs):						7.0 to 17.0	7.0 to 17.0
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	UPLAND	UPLAND
SVOA (ug/L)							
HEXACHLOROBUTADIENE	10 U	1 U	1 U	1 UJ	1 U	20 U	10 U
HEXACHLOROCYCLOPENTADIENE	10 U	1 UJ	1 UJ	1 UJ	1 U	20 UJ	10 U
HEXACHLOROETHANE	10 U	1 U	1 U	1 UJ	1 U	20 U	10 U
INDENO(1,2,3-CD)PYRENE	10 U	0.1 U	0.1 U	1 UJ	1 U	20 U	10 U
ISOPHORONE	10 U	1 U	1 U	1 UJ	1 U	20 U	10 U
N-NITROSO-DI-N-PROPYLAMINE	10 UJ	1 U	1 U	1 UJ	1 U	20 U	10 U
N-NITROSODIPHENYLAMINE	10 U	1 U	1 U	1 UJ	1 U	20 U	10 U
NAPHTHALENE	10 U	0.1 U	0.1 U	1 UJ	1 U	**3** J	10 U
NITROBENZENE	10 U	1 U	1 U	1 UJ	1 U	20 U	10 U
PENTACHLOROPHENOL	25 U	5 U	5 U	3 UJ	3 U	50 U	25 UJ
PHENANTHRENE	10 U	0.1 U	0.1 U	1 UJ	1 U	20 U	10 U
PHENOL	10 U	1 U	1 U	1 UJ	1 U	20 U	10 U
PYRENE	10 U	0.1 U	0.1 U	1 UJ	1 U	20 U	10 U
VOA (ug/L)							
1,1,1-TRICHLOROETHANE	1 U	2 UJ	2 U	2 U	10 U	1 U	1 U
1,1,2,2-TETRACHLOROETHANE	1 U	2 UJ	2 UJ	2 U	10 U	1 U	1 U
1,1,2-TRICHLOROETHANE	1 U	2 UJ	2 U	2 U	10 U	1 U	1 U
1,1-DICHLOROETHANE	1 U	2 UJ	2 U	2 U	10 U	1 UJ	1 U
1,1-DICHLOROETHENE	1 UJ	2 UJ	2 U	2 UJ	10 U	1 U	1 U
1,2-DICHLOROETHANE	0.5 U	0.5 UJ	0.5 U	0.5 U	3 U	0.5 U	0.5 U
1,2-DICHLOROETHENE (TOTAL)	1 U	N/A	N/A	2 U	10 U	1 U	1 U
1,2-DICHLOROPROPANE	1 U	2 UJ	2 U	2 U	10 U	1 U	1 U
2-BUTANONE	N/A	2 UJ	2 U	2 U	10 U	N/A	N/A
2-HEXANONE	2 U	2 UJ	2 UJ	2 U	10 U	N/A	2 U
4-METHYL-2-PENTANONE	2 U	2 UJ	2 U	2 U	10 U	2 U	2 U
ACETONE	N/A	2 UJ	2 UJ	2 U	18 UJ	N/A	10 UJ
BENZENE	1 U	2 UJ	2 U	2 U	3 U	1 U	1 U
BROMODICHLOROMETHANE	1 U	2 UJ	2 U	2 U	10 U	1 U	1 U
BROMOFORM	1 UJ	2 UJ	2 U	2 U	10 U	1 U	1 U
BROMOMETHANE	2 U	2 UJ	2 UJ	2 U	10 U	2 U	2 U
CARBON DISULFIDE	1 U	2 UJ	2 U	2 U	10 U	1 U	1 U
CARBON TETRACHLORIDE	0.5 U	0.5 UJ	0.5 UJ	0.5 U	3 U	0.5 UJ	0.5 U
CHLOROBENZENE	1 U	2 UJ	2 U	2 U	10 U	1 U	1 U
CHLOROETHANE	2 UJ	2 UJ	2 U	2 U	10 U	2 U	2 U
CHLOROFORM	1 U	2 UJ	2 U	2 U	10 U	1 U	1 U
CHLOROMETHANE	2 UJ	2 UJ	2 UJ	2 UJ	10 U	2 U	2 U
CIS-1,2-DICHLOROETHENE	N/A	2 UJ	2 UJ	N/A	N/A	N/A	N/A

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-5R	MW1-5R	MW1-5R	MW1-5R	MW1-5R	MW1-5R	MW1-6
Sample ID:	273-S01-030	273-S01-031	149-S01-016	149-S01-039	149-S01-057	149-S01-077	273-S01-019
Sample Date:	02-AUG-94	31-OCT-94	26-MAY-98	21-AUG-98	09-NOV-98	09-FEB-99	06-FEB-94
Screen Depth (feet bgs):	7.0 to 17.0	7.0 to 17.0	7.0 to 17.0	7.0 to 17.0	7.0 to 17.0	7.0 to 17.0	
ECO Habitat:	UPLAND	UPLAND	UPLAND	UPLAND	UPLAND	UPLAND	TIDAL MARSH
SVOA (ug/L)							
HEXACHLOROBUTADIENE	10 U	10 U	1 U	1 U	1 U	4 U	10 U
HEXACHLOROCYCLOPENTADIENE	10 U	10 UJ	1 UJ	1 UJ	1 UJ	4 U	10 UJ
HEXACHLOROETHANE	10 U	10 U	1 U	1 U	1 U	4 U	10 U
INDENO(1,2,3-CD)PYRENE	10 U	10 U	0.1 U	**0.1** J	1 U	4 U	10 U
ISOPHORONE	10 U	10 U	1 U	1 U	1 U	4 U	10 U
N-NITROSO-DI-N-PROPYLAMINE	10 U	10 U	1 U	1 U	1 U	4 U	10 U
N-NITROSODIPHENYLAMINE	10 U	10 U	1 U	1 U	1 U	4 U	10 U
NAPHTHALENE	10 U	10 U	**0.2**	0.1 U	1 U	4 U	10 U
NITROBENZENE	10 U	10 U	1 U	1 U	1 U	4 U	10 U
PENTACHLOROPHENOL	25 U	25 UJ	5 U	5 U	3 U	10 U	25 UJ
PHENANTHRENE	10 U	10 U	0.1 U	0.1 U	1 U	4 U	10 U
PHENOL	10 U	10 U	1 U	1 U	1 U	4 U	10 U
PYRENE	10 U	10 U	0.1 U	0.1 U	1 U	4 U	10 U
VOA (ug/L)							
1,1,1-TRICHLOROETHANE	1 U	1 U	2 U	2 U	2 U	4 U	1 U
1,1,2,2-TETRACHLOROETHANE	1 U	1 U	2 UJ	2 UJ	2 U	4 U	1 U
1,1,2-TRICHLOROETHANE	1 U	1 U	2 U	2 UJ	2 U	4 U	1 U
1,1-DICHLOROETHANE	1 U	1 U	2 U	2 U	2 U	4 U	1 U
1,1-DICHLOROETHENE	1 U	1 U	2 U	2 U	2 UJ	4 U	1 U
1,2-DICHLOROETHANE	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	1 U	0.5 U
1,2-DICHLOROETHENE (TOTAL)	1 U	1 U	N/A	N/A	2 U	4 U	1 U
1,2-DICHLOROPROPANE	1 U	1 U	2 U	2 U	2 U	4 U	1 U
2-BUTANONE	N/A	N/A	2 U	2 U	2 U	4 U	2 U
2-HEXANONE	N/A	2 U	2 UJ	2 UJ	2 U	4 U	2 U
4-METHYL-2-PENTANONE	2 U	2 U	2 UJ	2 UJ	2 U	4 U	2 U
ACETONE	10 UJ	N/A	2 UJ	2 UJ	2 U	7 UJ	2 UJ
BENZENE	1 U	1 U	2 U	2 U	2 U	1 U	1 U
BROMODICHLOROMETHANE	1 U	1 U	2 U	2 U	2 U	4 U	1 U
BROMOFORM	1 U	1 U	2 U	2 UJ	2 U	4 U	1 U
BROMOMETHANE	2 U	2 U	2 U	2 UJ	2 U	4 U	2 U
CARBON DISULFIDE	1 U	1 U	2 U	2 U	2 U	4 U	1 U
CARBON TETRACHLORIDE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
CHLOROBENZENE	1 U	1 U	2 U	2 U	2 U	4 U	1 U
CHLOROETHANE	2 U	2 U	2 U	2 U	2 U	4 U	2 U
CHLOROFORM	1 U	1 U	2 U	2 U	2 U	4 U	1 U
CHLOROMETHANE	2 UJ	2 UJ	2 U	2 U	2 UJ	**2** J	2 U
CIS-1,2-DICHLOROETHENE	N/A	N/A	2 U	2 U	N/A	N/A	N/A

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-6	MW1-6	MW1-6	MW1-7	MW1-7	MW1-7	MW1-7
Sample ID:	273-S01-020	273-S01-021	273-S01-023	273-S01-024	273-S01-025	273-S01-026	273-S01-027
Sample Date:	03-MAY-94	02-AUG-94	31-OCT-94	06-FEB-94	11-MAY-94	08-AUG-94	02-NOV-94
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	UPLAND	UPLAND	UPLAND	UPLAND
SVOA (ug/L)							
HEXACHLOROBUTADIENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
HEXACHLOROCYCLOPENTADIENE	10 U	10 U	10 UJ	10 UJ	10 U	10 U	10 U
HEXACHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
INDENO(1,2,3-CD)PYRENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
ISOPHORONE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
N-NITROSO-DI-N-PROPYLAMINE	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ
N-NITROSODIPHENYLAMINE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
NAPHTHALENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
NITROBENZENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
PENTACHLOROPHENOL	25 U	25 U	25 UJ	25 UJ	25 U	25 U	25 U
PHENANTHRENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
PHENOL	10 U	10 U	10 U	10 U	10 U	10 U	10 U
PYRENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
VOA (ug/L)							
1,1,1-TRICHLOROETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-TETRACHLOROETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-TRICHLOROETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-DICHLOROETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-DICHLOROETHENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-DICHLOROETHANE	0.5 U	0.5 U	1 UJ	0.5 U	0.5 U	0.5 UJ	0.5 U
1,2-DICHLOROETHENE (TOTAL)	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-DICHLOROPROPANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-BUTANONE	N/A	N/A	N/A	2 U	N/A	N/A	N/A
2-HEXANONE	2 U	N/A	2 U	2 UJ	2 U	2 U	2 UJ
4-METHYL-2-PENTANONE	2 U	2 U	2 U	2 U	2 U	2 U	2 UJ
ACETONE	20 UJ	10 UJ	N/A	2 UJ	N/A	N/A	N/A
BENZENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U
BROMODICHLOROMETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U
BROMOFORM	1 U	1 U	1 U	1 U	1 U	1 UJ	1 U
BROMOMETHANE	2 U	2 U	2 U	2 U	2 U	2 U	2 U
CARBON DISULFIDE	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CARBON TETRACHLORIDE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLOROBENZENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CHLOROETHANE	2 U	2 U	2 U	2 U	2 U	2 U	2 U
CHLOROFORM	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CHLOROMETHANE	2 U	2 UJ	2 UJ	2 U	2 U	2 U	2 U
CIS-1,2-DICHLOROETHENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-8	MW1-8	MW1-8	MW1-8	MW1-8	MW1-8	MW1-8
Sample ID:	273-S01-124	273-S01-126	273-S01-128	273-S01-130	149-S01-017	149-S01-040	149-S01-058
Sample Date:	06-FEB-94	11-MAY-94	08-AUG-94	02-NOV-94	27-MAY-98	24-AUG-98	06-NOV-98
Screen Depth (feet bgs):	6.0 to 17.0	6.0 to 17.0	6.0 to 17.0	6.0 to 17.0	6.0 to 17.0	6.0 to 17.0	6.0 to 17.0
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
SVOA (ug/L)							
HEXACHLOROBUTADIENE	10 U	10 U	10 U	10 U	1 U	1 U	1 U
HEXACHLOROCYCLOPENTADIENE	10 UJ	10 U	10 U	10 U	1 UJ	1 UJ	1 UJ
HEXACHLOROETHANE	10 U	10 U	10 U	10 U	1 U	1 U	1 U
INDENO(1,2,3-CD)PYRENE	10 U	10 U	10 U	10 U	0.1 U	0.1 U	1 U
ISOPHORONE	10 U	10 U	10 U	10 U	1 U	1 U	1 U
N-NITROSO-DI-N-PROPYLAMINE	10 U	10 U	10 U	10 UJ	1 U	1 U	1 U
N-NITROSODIPHENYLAMINE	10 U	10 U	10 U	10 U	1 U	1 UJ	1 U
NAPHTHALENE	10 U	10 U	10 U	10 U	0.1 U	0.1 U	1 U
NITROBENZENE	10 U	10 U	10 U	10 U	1 U	1 U	1 U
PENTACHLOROPHENOL	25 UJ	25 UJ	25 U	25 U	5 U	6 U	3 UJ
PHENANTHRENE	10 U	10 UJ	10 UJ	10 U	0.1 U	0.1 U	1 U
PHENOL	10 U	10 U	10 U	**0.7** J	1 U	1 U	1 U
PYRENE	10 U	10 U	10 U	10 U	0.1 U	0.1 U	1 U
VOA (ug/L)							
1,1,1-TRICHLOROETHANE	1 U	1 U	1 U	1 U	2 U	2 U	2 U
1,1,2,2-TETRACHLOROETHANE	1 U	1 U	1 U	1 U	2 U	2 UJ	2 U
1,1,2-TRICHLOROETHANE	1 U	1 U	1 U	1 U	2 U	2 U	2 U
1,1-DICHLOROETHANE	**5**	1 U	**19**	**20**	2 U	2 U	2 U
1,1-DICHLOROETHENE	1 U	1 U	1 U	1 U	2 U	2 U	2 U
1,2-DICHLOROETHANE	0.5 U	0.5 U	0.5 U	**0.9**	0.5 UJ	0.5 U	0.5 U
1,2-DICHLOROETHENE (TOTAL)	**6**	1 U	**4**	**3**	N/A	N/A	2 UJ
1,2-DICHLOROPROPANE	1 U	1 U	1 U	1 U	2 U	2 U	2 U
2-BUTANONE	2 U	N/A	N/A	N/A	2 U	2 U	2 U
2-HEXANONE	2 U	2 U	2 U	2 UJ	2 UJ	2 UJ	2 UJ
4-METHYL-2-PENTANONE	2 U	2 U	2 U	2 UJ	2 UJ	2 U	2 U
ACETONE	2 UJ	N/A	N/A	10 UJ	2 UJ	2 UJ	2 UJ
BENZENE	1 U	1 U	1 U	1 U	2 U	2 U	2 U
BROMODICHLOROMETHANE	1 U	1 U	1 U	1 U	2 U	2 U	2 U
BROMOFORM	1 U	1 U	1 U	1 U	2 U	2 U	2 U
BROMOMETHANE	2 U	2 U	2 U	2 U	2 U	2 UJ	2 U
CARBON DISULFIDE	1 U	1 U	1 U	1 U	2 U	2 U	2 UJ
CARBON TETRACHLORIDE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U
CHLOROBENZENE	1 U	1 U	1 U	1 U	2 U	2 U	2 U
CHLOROETHANE	2 U	2 U	2 U	2 U	2 U	2 U	2 U
CHLOROFORM	1 U	1 U	1 U	1 U	2 U	2 U	2 U
CHLOROMETHANE	2 U	2 U	2 UJ	2 U	2 UJ	2 UJ	2 U
CIS-1,2-DICHLOROETHENE	N/A	N/A	N/A	N/A	2 U	2 UJ	N/A

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW
Point Name:	MW1-8	MW1-9	MW1-9	MW1-9	MW1-9
Sample ID:	149-S01-078	273-S01-125	273-S01-127	273-S01-129	273-S01-131
Sample Date:	09-FEB-99	06-FEB-94	11-MAY-94	09-AUG-94	02-NOV-94
Screen Depth (feet bgs):	6.0 to 17.0	3.0 to 13.0	3.0 to 13.0	3.0 to 13.0	3.0 to 13.0
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
SVOA (ug/L)					
HEXACHLOROBUTADIENE	4 U	10 U	10 U	10 U	10 U
HEXACHLOROCYCLOPENTADIENE	4 U	10 UJ	10 U	10 U	10 U
HEXACHLOROETHANE	4 U	10 U	10 U	10 U	10 U
INDENO(1,2,3-CD)PYRENE	4 U	10 U	10 U	10 U	10 U
ISOPHORONE	4 U	10 U	10 U	10 U	10 U
N-NITROSO-DI-N-PROPYLAMINE	4 U	10 U	10 U	10 U	10 UJ
N-NITROSODIPHENYLAMINE	4 U	10 U	10 U	10 U	10 U
NAPHTHALENE	4 U	10 U	10 U	10 U	10 U
NITROBENZENE	4 U	10 U	10 U	10 U	10 U
PENTACHLOROPHENOL	10 U	25 UJ	25 U	25 U	25 U
PHENANTHRENE	4 U	10 U	10 U	10 UJ	10 U
PHENOL	4 U	10 U	10 U	10 U	10 U
PYRENE	4 U	10 U	10 U	10 U	10 U
VOA (ug/L)					
1,1,1-TRICHLOROETHANE	10 U	**0.7** J	1 U	1 U	1 U
1,1,2,2-TETRACHLOROETHANE	10 U	1 U	1 U	1 U	1 U
1,1,2-TRICHLOROETHANE	10 U	1 U	1 U	1 U	1 U
1,1-DICHLOROETHANE	10 U	1 U	1 U	1 U	1 U
1,1-DICHLOROETHENE	10 U	1 U	1 U	1 U	1 UJ
1,2-DICHLOROETHANE	3 U	0.5 U	0.5 U	0.5 UJ	0.5 U
1,2-DICHLOROETHENE (TOTAL)	10 U	1 U	1 U	1 U	1 U
1,2-DICHLOROPROPANE	10 U	1 U	1 U	1 U	1 U
2-BUTANONE	10 U	2 U	N/A	N/A	N/A
2-HEXANONE	10 U	2 U	2 U	2 U	2 U
4-METHYL-2-PENTANONE	10 U	2 U	2 U	2 U	2 U
ACETONE	18 UJ	2 UJ	N/A	N/A	N/A
BENZENE	3 U	1 U	1 U	1 U	1 U
BROMODICHLOROMETHANE	10 U	1 U	1 U	1 U	1 U
BROMOFORM	10 U	1 U	1 U	1 UJ	1 UJ
BROMOMETHANE	10 U	2 U	2 U	2 U	2 U
CARBON DISULFIDE	10 U	1 U	1 U	1 U	1 U
CARBON TETRACHLORIDE	3 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLOROBENZENE	10 U	1 U	1 U	1 U	1 U
CHLOROETHANE	10 U	2 U	2 U	2 U	2 UJ
CHLOROFORM	10 U	1 U	1 U	1 U	1 U
CHLOROMETHANE	10 U	2 U	2 U	2 U	2 UJ
CIS-1,2-DICHLOROETHENE	N/A	N/A	N/A	N/A	N/A

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-1	MW1-1	MW1-1	MW1-1	MW1-10	MW1-10	MW1-10
Sample ID:	273-S01-001	273-S01-003	273-S01-004	273-S01-005	149-S01-009	149-S01-032	149-S01-050
Sample Date:	07-FEB-94	03-MAY-94	02-AUG-94	31-OCT-94	21-MAY-98	20-AUG-98	09-NOV-98
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
VOA (ug/L)							
CIS-1,3-DICHLOROPROPENE	1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U
DIBROMOCHLOROMETHANE	1 U	1 U	1 U	1 U	2 U	2 UJ	2 U
ETHYLBENZENE	1 U	1 U	1 U	1 U	2 U	2 UJ	2 U
METHYLENE CHLORIDE	1 U	1 U	1 U	1 UJ	2 UJ	2 UJ	2 UJ
STYRENE	1 U	1 U	1 U	1 U	2 U	2 UJ	2 U
TETRACHLOROETHENE	1 U	1 U	1 U	1 U	2 U	2 UJ	2 U
TOLUENE	1 U	1 U	1 U	1 U	2 U	2 UJ	2 U
TRANS-1,2-DICHLOROETHENE	N/A	N/A	N/A	N/A	2 U	2 UJ	N/A
TRANS-1,3-DICHLOROPROPENE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U
TRICHLOROETHENE	1 U	1 U	1 U	1 U	2 U	2 UJ	2 U
VINYL ACETATE	2 UJ	N/A	N/A	N/A	N/A	N/A	N/A
VINYL CHLORIDE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U
XYLENE (TOTAL)	1 U	1 U	1 U	1 U	2 U	2 UJ	2 U

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-10	MW1-11A	MW1-11A	MW1-11A	MW1-11A	MW1-11C	MW1-11C
Sample ID:	149-S01-070	149-S01-010	149-S01-033	149-S01-051	149-S01-071	149-S01-011	149-S01-034
Sample Date:	08-FEB-99	22-MAY-98	20-AUG-98	06-NOV-98	08-FEB-99	04-JUN-98	20-AUG-98
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
VOA (ug/L)							
CIS-1,3-DICHLOROPROPENE	3 U	0.5 U	0.5 UJ	0.5 U	3 U	0.5 UJ	0.5 UJ
DIBROMOCHLOROMETHANE	10 U	2 U	2 UJ	2 U	10 U	2 UJ	2 UJ
ETHYLBENZENE	10 U	2 U	2 UJ	2 U	10 U	2 UJ	2 UJ
METHYLENE CHLORIDE	10 U	2 UJ	2 UJ	2 U	10 U	2 UJ	2 UJ
STYRENE	10 U	2 U	2 UJ	2 U	10 U	2 UJ	2 UJ
TETRACHLOROETHENE	10 U	2 U	2 UJ	2 U	10 U	2 UJ	2 UJ
TOLUENE	10 U	2 U	2 UJ	2 U	10 U	2 UJ	2 UJ
TRANS-1,2-DICHLOROETHENE	N/A	2 U	2 UJ	N/A	N/A	2 UJ	2 UJ
TRANS-1,3-DICHLOROPROPENE	3 U	0.5 U	0.5 UJ	0.5 U	3 U	0.5 UJ	0.5 UJ
TRICHLOROETHENE	10 U	**1 J**	2 UJ	2 U	10 U	2 UJ	2 UJ
VINYL ACETATE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
VINYL CHLORIDE	3 U	0.5 U	0.5 UJ	0.5 U	3 U	0.5 UJ	0.5 UJ
XYLENE (TOTAL)	10 U	2 U	2 UJ	2 U	10 U	2 UJ	2 UJ

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-11C	MW1-11C	MW1-12	MW1-12	MW1-12	MW1-12	MW1-13
Sample ID:	149-S01-052	149-S01-072	149-S01-012	149-S01-036	149-S01-053	149-S01-073	149-S01-014
Sample Date:	12-NOV-98	08-FEB-99	26-MAY-98	21-AUG-98	09-NOV-98	08-FEB-99	26-MAY-98
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	UPLAND
VOA (ug/L)							
CIS-1,3-DICHLOROPROPENE	0.5 U	5 U	0.5 U	0.5 U	0.5 U	13 U	0.5 U
DIBROMOCHLOROMETHANE	2 U	20 U	2 U	2 UJ	2 U	50 U	2 U
ETHYLBENZENE	2 U	20 U	2 U	2 U	2 U	50 U	2 U
METHYLENE CHLORIDE	2 U	20 U	2 UJ	2 UJ	2 UJ	50 U	2 UJ
STYRENE	2 U	20 U	2 U	2 U	2 U	50 U	2 U
TETRACHLOROETHENE	2 U	20 U	2 U	2 U	2 U	50 U	2 U
TOLUENE	2 U	20 U	2 U	2 U	2 U	50 U	**0.5** J
TRANS-1,2-DICHLOROETHENE	N/A	N/A	2 U	2 U	N/A	N/A	2 U
TRANS-1,3-DICHLOROPROPENE	0.5 U	5 U	0.5 U	0.5 UJ	0.5 U	13 U	0.5 U
TRICHLOROETHENE	2 U	20 U	2 U	2 U	2 U	50 U	2 U
VINYL ACETATE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
VINYL CHLORIDE	0.5 U	5 U	0.5 U	0.5 UJ	0.5 U	13 U	0.5 U
XYLENE (TOTAL)	2 U	**9** J	2 U	2 U	2 U	50 U	2 U

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-13	MW1-13	MW1-13	MW1-2	MW1-2	MW1-2	MW1-2
Sample ID:	149-S01-037	149-S01-054	149-S01-074	273-S01-006	273-S01-007	273-S01-008	273-S01-009
Sample Date:	21-AUG-98	06-NOV-98	08-FEB-99	07-FEB-94	11-MAY-94	08-AUG-94	02-NOV-94
Screen Depth (feet bgs):							
ECO Habitat:	UPLAND	UPLAND	UPLAND	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
VOA (ug/L)							
CIS-1,3-DICHLOROPROPENE	0.5 U	0.5 U	5 U	1 U	0.5 U	0.5 U	0.5 U
DIBROMOCHLOROMETHANE	2 UJ	2 U	20 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	**0.3** J	2 U	20 U	1 U	1 U	1 U	1 U
METHYLENE CHLORIDE	2 UJ	2 UJ	20 U	1 U	1 U	1 U	1 U
STYRENE	2 U	2 U	20 U	1 U	1 U	1 U	1 U
TETRACHLOROETHENE	2 U	2 U	20 U	1 U	1 U	1 U	1 U
TOLUENE	**0.5** J	2 U	20 U	1 U	1 U	1 U	1 U
TRANS-1,2-DICHLOROETHENE	2 U	N/A	N/A	N/A	N/A	N/A	N/A
TRANS-1,3-DICHLOROPROPENE	0.5 UJ	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U
TRICHLOROETHENE	2 U	2 U	20 U	1 U	1 U	1 U	1 U
VINYL ACETATE	N/A	N/A	N/A	2 UJ	N/A	N/A	N/A
VINYL CHLORIDE	0.5 UJ	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U
XYLENE (TOTAL)	2 U	2 U	20 U	1 U	1 U	1 U	1 U

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-3	MW1-3	MW1-3	MW1-3	MW1-4	MW1-4	MW1-4
Sample ID:	273-S01-010	273-S01-011	273-S01-013	273-S01-014	273-S01-015	273-S01-016	273-S01-017
Sample Date:	07-FEB-94	10-MAY-94	02-AUG-94	31-OCT-94	06-FEB-94	11-MAY-94	08-AUG-94
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
VOA (ug/L)							
CIS-1,3-DICHLOROPROPENE	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U	0.5 U
DIBROMOCHLOROMETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U
METHYLENE CHLORIDE	1 UJ	1 U	1 U	1 UJ	1 U	1 U	1 UJ
STYRENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TETRACHLOROETHENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TRANS-1,2-DICHLOROETHENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TRANS-1,3-DICHLOROPROPENE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TRICHLOROETHENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U
VINYL ACETATE	N/A	N/A	N/A	N/A	2 UJ	N/A	N/A
VINYL CHLORIDE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
XYLENE (TOTAL)	1 U	1 U	1 U	1 U	1 U	1 U	1 U

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-4	MW1-4	MW1-4	MW1-4	MW1-4	MW1-5R	MW1-5R
Sample ID:	273-S01-018	149-S01-015	149-S01-038	149-S01-056	149-S01-075	273-S01-028	273-S01-029
Sample Date:	02-NOV-94	21-MAY-98	24-AUG-98	09-NOV-98	09-FEB-99	06-FEB-94	03-MAY-94
Screen Depth (feet bgs):						7.0 to 17.0	7.0 to 17.0
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	UPLAND	UPLAND
VOA (ug/L)							
CIS-1,3-DICHLOROPROPENE	0.5 U	0.5 UJ	0.5 U	0.5 U	3 U	0.5 U	0.5 U
DIBROMOCHLOROMETHANE	1 U	2 UJ	2 U	2 U	10 U	1 U	1 U
ETHYLBENZENE	1 U	2 UJ	2 U	2 U	10 U	1 U	1 U
METHYLENE CHLORIDE	1 UJ	2 UJ	2 UJ	2 UJ	10 UJ	1 UJ	1 U
STYRENE	1 U	2 UJ	2 U	2 U	10 U	1 U	1 U
TETRACHLOROETHENE	1 U	2 UJ	2 UJ	2 U	10 U	1 U	1 U
TOLUENE	1 U	2 UJ	2 U	2 U	10 U	1 U	1 U
TRANS-1,2-DICHLOROETHENE	N/A	2 UJ	2 U	N/A	N/A	N/A	N/A
TRANS-1,3-DICHLOROPROPENE	0.5 U	0.5 UJ	0.5 U	0.5 U	3 U	0.5 U	0.5 U
TRICHLOROETHENE	1 U	2 UJ	**0.7** J	2 U	10 U	1 U	1 U
VINYL ACETATE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
VINYL CHLORIDE	0.5 U	0.5 UJ	0.5 UJ	0.5 U	3 U	0.5 U	0.5 U
XYLENE (TOTAL)	1 U	2 UJ	2 U	2 U	10 U	1 U	1 U

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-5R	MW1-5R	MW1-5R	MW1-5R	MW1-5R	MW1-5R	MW1-6
Sample ID:	273-S01-030	273-S01-031	149-S01-016	149-S01-039	149-S01-057	149-S01-077	273-S01-019
Sample Date:	02-AUG-94	31-OCT-94	26-MAY-98	21-AUG-98	09-NOV-98	09-FEB-99	06-FEB-94
Screen Depth (feet bgs):	7.0 to 17.0	7.0 to 17.0	7.0 to 17.0	7.0 to 17.0	7.0 to 17.0	7.0 to 17.0	
ECO Habitat:	UPLAND	UPLAND	UPLAND	UPLAND	UPLAND	UPLAND	TIDAL MARSH
VOA (ug/L)							
CIS-1,3-DICHLOROPROPENE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	1 U
DIBROMOCHLOROMETHANE	1 U	1 U	2 U	2 UJ	2 U	4 U	1 U
ETHYLBENZENE	1 U	1 U	2 U	2 U	2 U	4 U	1 U
METHYLENE CHLORIDE	1 U	1 UJ	2 UJ	2 UJ	2 UJ	4 U	1 U
STYRENE	1 U	1 U	2 U	2 U	2 U	4 U	1 U
TETRACHLOROETHENE	1 U	1 U	2 U	2 U	2 U	4 U	1 U
TOLUENE	1 U	1 U	2 U	2 U	2 U	4 U	1 U
TRANS-1,2-DICHLOROETHENE	N/A	N/A	2 U	2 U	N/A	N/A	N/A
TRANS-1,3-DICHLOROPROPENE	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	1 U	0.5 U
TRICHLOROETHENE	1 U	1 U	2 U	2 U	2 U	4 U	1 U
VINYL ACETATE	N/A	N/A	N/A	N/A	N/A	N/A	2 UJ
VINYL CHLORIDE	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	1 U	0.5 U
XYLENE (TOTAL)	1 U	1 U	2 U	2 U	2 U	4 U	1 U

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-6	MW1-6	MW1-6	MW1-7	MW1-7	MW1-7	MW1-7
Sample ID:	273-S01-020	273-S01-021	273-S01-023	273-S01-024	273-S01-025	273-S01-026	273-S01-027
Sample Date:	03-MAY-94	02-AUG-94	31-OCT-94	06-FEB-94	11-MAY-94	08-AUG-94	02-NOV-94
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	UPLAND	UPLAND	UPLAND	UPLAND
VOA (ug/L)							
CIS-1,3-DICHLOROPROPENE	0.5 U	0.5 U	0.5 U	1 U	0.5 U	0.5 U	0.5 U
DIBROMOCHLOROMETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U
METHYLENE CHLORIDE	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U
STYRENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TETRACHLOROETHENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TRANS-1,2-DICHLOROETHENE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TRANS-1,3-DICHLOROPROPENE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TRICHLOROETHENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U
VINYL ACETATE	N/A	N/A	N/A	2 UJ	N/A	N/A	N/A
VINYL CHLORIDE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
XYLENE (TOTAL)	1 U	1 U	1 U	1 U	1 U	1 U	1 U

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-8	MW1-8	MW1-8	MW1-8	MW1-8	MW1-8	MW1-8
Sample ID:	273-S01-124	273-S01-126	273-S01-128	273-S01-130	149-S01-017	149-S01-040	149-S01-058
Sample Date:	06-FEB-94	11-MAY-94	08-AUG-94	02-NOV-94	27-MAY-98	24-AUG-98	06-NOV-98
Screen Depth (feet bgs):	6.0 to 17.0	6.0 to 17.0	6.0 to 17.0	6.0 to 17.0	6.0 to 17.0	6.0 to 17.0	6.0 to 17.0
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
VOA (ug/L)							
CIS-1,3-DICHLOROPROPENE	1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
DIBROMOCHLOROMETHANE	1 U	1 U	1 U	1 U	2 U	2 U	2 U
ETHYLBENZENE	1 U	1 U	1 U	1 U	2 U	2 U	2 U
METHYLENE CHLORIDE	1 U	1 U	1 U	1 U	2 UJ	2 UJ	2 U
STYRENE	1 U	1 U	1 U	1 U	2 U	2 U	2 U
TETRACHLOROETHENE	1 U	1 U	1 U	1 U	2 U	2 UJ	2 U
TOLUENE	**4**	1 U	1 U	1 U	2 U	2 U	2 U
TRANS-1,2-DICHLOROETHENE	N/A	N/A	N/A	N/A	2 U	2 U	N/A
TRANS-1,3-DICHLOROPROPENE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TRICHLOROETHENE	1 U	1 U	1 U	1 U	2 U	2 U	2 U
VINYL ACETATE	2 UJ	N/A	N/A	N/A	N/A	N/A	N/A
VINYL CHLORIDE	**2**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U
XYLENE (TOTAL)	1 U	1 U	1 U	1 U	2 U	2 U	2 U

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW
Point Name:	MW1-8	MW1-9	MW1-9	MW1-9	MW1-9
Sample ID:	149-S01-078	273-S01-125	273-S01-127	273-S01-129	273-S01-131
Sample Date:	09-FEB-99	06-FEB-94	11-MAY-94	09-AUG-94	02-NOV-94
Screen Depth (feet bgs):	6.0 to 17.0	3.0 to 13.0	3.0 to 13.0	3.0 to 13.0	3.0 to 13.0
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
VOA (ug/L)					
CIS-1,3-DICHLOROPROPENE	3 U	1 U	0.5 U	0.5 U	0.5 U
DIBROMOCHLOROMETHANE	10 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	10 U	1 U	1 U	1 U	1 U
METHYLENE CHLORIDE	10 UJ	1 U	1 U	1 U	1 UJ
STYRENE	10 U	1 U	1 U	1 U	1 U
TETRACHLOROETHENE	10 U	1 U	1 U	1 U	1 U
TOLUENE	10 U	1 U	1 U	1 U	1 U
TRANS-1,2-DICHLOROETHENE	N/A	N/A	N/A	N/A	N/A
TRANS-1,3-DICHLOROPROPENE	3 U	0.5 U	0.5 U	0.5 U	0.5 U
TRICHLOROETHENE	10 U	1 U	1 U	1 U	1 U
VINYL ACETATE	N/A	2 UJ	N/A	N/A	N/A
VINYL CHLORIDE	3 U	0.5 U	0.5 U	0.5 U	0.5 U
XYLENE (TOTAL)	10 U	1 U	1 U	1 U	1 U

TABLE B-5 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Notes and Abbreviations:
- Detections appear in boldface type
- bgs - Below ground surface
- J - Estimated concentration
- mg/L - Milligrams per liter
- MW - Monitoring well
- NA - Not analyzed
- U - Not detected
- ug/L - Micrograms per liter

TABLE B-6

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, INORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-1	MW1-1	MW1-1	MW1-1	MW1-10	MW1-10	MW1-10
Sample ID:	273-S01-001	273-S01-003	273-S01-004	273-S01-005	149-S01-009	149-S01-032	149-S01-050
Sample Date:	07-FEB-94	03-MAY-94	02-AUG-94	31-OCT-94	21-MAY-98	20-AUG-98	09-NOV-98
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
DMETAL (ug/L)							
ALUMINUM	71.1 UJ	30.7 U	42.4 U	28.2 U	**1,290** J	**565**	**461** J
ANTIMONY	66.7 UJ	8.3 UJ	**3.1** J	**2** J	5.3 UJ	1.5 U	40 U
ARSENIC	4.2 UJ	**5.5** J	**3.6** J	**6.8** J	**3.4** J	2.1 UJ	26 U
BARIUM	**156** J	**150** J	**227**	**189** J	**434**	**266**	**403** J
BERYLLIUM	1.1 U	**0.73** J	1.1 U	**1.2** J	0.5 U	0.5 UJ	2.2 U
BORON	N/A	N/A	N/A	N/A	**1,170**	N/A	N/A
CADMIUM	2.2 U	2.7 U	3.6 U	3.5 U	**0.62** J	**1.2** J	4.2 U
CALCIUM	**142,000** J	**279,000**	**269,000**	**287,000**	**143,000**	**373,000**	**484,000**
CHROMIUM	4.4 U	**7.9** J	**12.3**	**5.7** J	**3.6** J	**3.8** J	10.6 UJ
COBALT	6.7 U	4.2 U	6.6 U	7.7 U	0.5 U	0.5 UJ	**12.2** J
COPPER	5.6 UJ	6.1 U	**7.9** J	**12.2** J	**7** J	4 UJ	**27.7** J
IRON	122 UJ	**4,940**	**1,840**	**4,130** J	**1,630**	**1,530** J	**586** J
LEAD	1.1 U	1.2 UJ	1.2 UJ	**1.2** J	1 U	**1.2** J	16.2 U
MAGNESIUM	**142,000** J	**428,000**	**343,000**	**415,000**	**238,000**	**484,000**	**839,000**
MANGANESE	**412** J	**686**	**613**	**654**	**66**	**250** J	**69** J
MERCURY	0.2 U	0.2 U	0.2 U	0.2 U	0.1 U	0.1 UJ	**0.29**
MOLYBDENUM	**36.7**	**23.6** J	45 UJ	**32.2** J	**22.3**	**10.3** J	10.2 U
NICKEL	13.3 UJ	10.6 UJ	**19.4** J	17.8 UJ	**5.6** J	**8.5** J	9.4 U
POTASSIUM	**71,300** J	**216,000** J	**196,000** J	**239,000** J	**84,500**	**152,000**	**264,000**
SELENIUM	2.6 UJ	19 U	**4.1** J	N/A	**5.2**	**6.4**	44 UJ
SILVER	N/A	4.5 U	3.8 U	2.1 U	0.5 U	0.5 U	**10** J
SODIUM	**1,400,000**	**3,660,000**	**3,020,000**	**3,580,000**	**1,950,000** J	**3,330,000**	**6,470,000**
THALLIUM	2.2 UJ	1.3 U	21 UJ	8 U	1.5 UJ	1.5 UJ	**96.1** J
VANADIUM	5.6 U	4.6 U	6.8 U	7 U	**16.6** J	**11.8** J	6.4 U
ZINC	20 UJ	1.6 U	4 U	9.2 UJ	**84** J	7.2 UJ	**21.1** J

TABLE B-6 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, INORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-10	MW1-11A	MW1-11A	MW1-11A	MW1-11A	MW1-11C	MW1-11C
Sample ID:	149-S01-070	149-S01-010	149-S01-033	149-S01-051	149-S01-071	149-S01-011	149-S01-034
Sample Date:	08-FEB-99	22-MAY-98	20-AUG-98	06-NOV-98	08-FEB-99	04-JUN-98	20-AUG-98
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
DMETAL (ug/L)							
ALUMINUM	108 UJ	**5,350** J	**735**	**1,910**	54 UJ	**164**	140 UJ
ANTIMONY	40 U	5.6 UJ	1.5 U	20 U	20 U	**6.4**	1.5 U
ARSENIC	26 UJ	**5.9**	3 UJ	13 U	13 UJ	**24.5**	**21.4**
BARIUM	**89** J	**580**	**172**	**832** J	**455** J	**330**	**62** J
BERYLLIUM	2.2 U	0.5 U	0.5 UJ	1.1 U	1.1 U	0.5 U	0.5 UJ
BORON	N/A	**2,580**	N/A	N/A	N/A	**5,500**	N/A
CADMIUM	4.2 U	**0.95** J	0.5 UJ	2.6 UJ	2.1 U	**0.52** J	0.5 UJ
CALCIUM	**310,000**	**144,000**	**142,000**	**565,000**	**255,000**	**530,000**	**525,000**
CHROMIUM	10.6 U	**10.4**	**2** J	**13.8** J	5.4 UJ	0.58 UJ	**1.3** J
COBALT	8.8 U	**4.5** J	**3.5** J	**8.3** J	4.4 U	**2.5** J	**1** J
COPPER	18.6 U	**15.1** J	**6.2**	**35.6** J	**19.9** J	0.5 U	**6.8**
IRON	34 UJ	**8,900**	**1,480** J	**3,660**	17 UJ	**3,370**	**2,660** J
LEAD	N/A	**2.7**	**1.4** J	**14.7** J	N/A	1 U	1 U
MAGNESIUM	**631,000**	**295,000**	**291,000**	**741,000**	**443,000**	**1,400,000**	**1,380,000**
MANGANESE	7.4 UJ	**630**	**1,190** J	**907**	**293** J	**1,100**	**1,020** J
MERCURY	0.11 U	0.1 U	0.1 UJ	0.11 U	0.11 U	0.1 U	0.1 UJ
MOLYBDENUM	10.2 U	**25.6**	**8.6** J	**9.9** J	**11.5** J	**21.8**	**9.3** J
NICKEL	9.4 U	**17** J	**12.8** J	4.7 U	4.7 U	**23.6** J	**17** J
POTASSIUM	**228,000** J	**115,000** J	**115,000**	**208,000**	**160,000** J	**412,000**	**410,000**
SELENIUM	N/A	1 U	1 U	22 UJ	N/A	1 UJ	1 U
SILVER	5.2 U	0.5 U	0.5 U	2.6 U	**2.9** J	**0.59** J	0.5 U
SODIUM	**5,150,000**	**2,460,000** J	**2,470,000**	**4,420,000**	**3,230,000**	**9,900,000** J	**10,600,000**
THALLIUM	N/A	1.5 UJ	1.5 UJ	**49** J	N/A	1.5 UJ	1.5 UJ
VANADIUM	6.4 U	**21** J	**5.6** J	**9** J	3.2 U	**0.6** J	0.5 UJ
ZINC	10.4 U	**148** J	**14.4** J	**129** J	**75.8** J	**119**	**26.6** J

TABLE B-6 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, INORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-11C	MW1-11C	MW1-12	MW1-12	MW1-12	MW1-12	MW1-13
Sample ID:	149-S01-052	149-S01-072	149-S01-012	149-S01-036	149-S01-053	149-S01-073	149-S01-014
Sample Date:	12-NOV-98	08-FEB-99	26-MAY-98	21-AUG-98	09-NOV-98	08-FEB-99	26-MAY-98
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	UPLAND
DMETAL (ug/L)							
ALUMINUM	162 U	162 UJ	**25,200**	**1,810** J	108 U	54 UJ	**304**
ANTIMONY	60 U	60 U	**4.2**	1.5 U	40 U	20 U	**4.6**
ARSENIC	**67.5** J	**76** J	**13.6**	**8.6**	26 U	**13.9** J	**6.7**
BARIUM	43.5 UJ	**190** J	**645**	**98.5** J	**107** J	**300** J	**650**
BERYLLIUM	3.3 U	3.3 U	**0.8** J	0.5 UJ	2.2 U	1.1 U	0.5 U
BORON	N/A	N/A	**3,510**	N/A	N/A	N/A	**5,060**
CADMIUM	6.3 U	6.3 U	**3.3**	**0.86** J	4.2 U	2.1 U	0.5 U
CALCIUM	**574,000**	**576,000**	**277,000**	**552,000** J	**263,000**	**230,000**	**218,000**
CHROMIUM	15.9 U	15.9 U	**52.5**	**6.6** J	10.6 UJ	5.3 U	**3.7** J
COBALT	13.2 U	13.2 U	**15.7** J	**5.6** J	**22.6** J	4.4 U	**2.3** J
COPPER	84.3 UJ	**204**	**41.4**	8.4 UJ	18.6 U	12.8 UJ	**4.9**
IRON	**5,990** J	**5,330** J	**34,900**	**11,900**	**6,670**	**1,830** J	**3,970**
LEAD	25.8 UJ	N/A	**11.7**	**2.7** J	16.2 U	N/A	**1** J
MAGNESIUM	**1,440,000**	**1,430,000**	**543,000**	**1,210,000** J	**558,000**	**327,000**	**152,000**
MANGANESE	**1,080**	**1,010** J	**4,530**	**4,730** J	**4,460**	**2,190** J	**232**
MERCURY	0.11 U	0.11 U	**0.13** J	0.1 U	**0.24**	0.11 U	**0.1** J
MOLYBDENUM	16.6 UJ	15.3 U	**35.7**	**30.6**	**24.9** J	**25.8** J	**2.7** J
NICKEL	14.1 U	14.1 U	**58.5**	**27.6** J	9.4 U	**8.6** J	**11.5**
POTASSIUM	**525,000** J	**566,000** J	**219,000**	**486,000** J	**270,000**	**176,000** J	**224,000**
SELENIUM	66 U	N/A	1 U	1 U	44 UJ	N/A	1 U
SILVER	7.8 U	7.8 U	**1.2**	**0.81** J	5.2 U	2.6 U	0.5 U
SODIUM	**11,600,000**	**11,000,000**	**4,300,000**	**10,200,000**	**5,300,000**	**2,790,000**	**1,840,000**
THALLIUM	96.7 UJ	N/A	1.5 UJ	1.5 UJ	**109**	N/A	1.5 UJ
VANADIUM	9.6 U	9.6 U	**90**	**11** J	**6.5** J	3.2 U	**5.8** J
ZINC	15.6 U	**30.4** J	**232**	**33.7** J	**11.3** J	**85.1** J	**128**

TABLE B-6 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, INORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-13	MW1-13	MW1-13	MW1-2	MW1-2	MW1-2	MW1-2
Sample ID:	149-S01-037	149-S01-054	149-S01-074	273-S01-006	273-S01-007	273-S01-008	273-S01-009
Sample Date:	21-AUG-98	06-NOV-98	08-FEB-99	07-FEB-94	11-MAY-94	08-AUG-94	02-NOV-94
Screen Depth (feet bgs):							
ECO Habitat:	UPLAND	UPLAND	UPLAND	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
DMETAL (ug/L)							
ALUMINUM	**3,210** J	**1,590**	81 UJ	74.4 UJ	30.7 U	42.4 U	28.2 U
ANTIMONY	1.5 U	20 U	30 U	66.7 UJ	7.4 UJ	3.7 UJ	1.2 U
ARSENIC	**12.8**	13 U	19.5 UJ	8.1 UJ	**9** J	**7.2** J	**10.7**
BARIUM	**535** J	**916** J	**509** J	53.3 UJ	**38.6** J	**49.1** J	**53.9** J
BERYLLIUM	0.5 UJ	1.1 U	1.7 U	1.1 U	0.4 U	1.1 U	1 U
BORON	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CADMIUM	**0.94** J	2.1 U	3.2 U	2.2 U	2.7 U	3.6 UJ	3.5 U
CALCIUM	**220,000** J	**170,000**	**168,000**	**77,600** J	**59,000**	**42,300**	**46,900**
CHROMIUM	**9.8** J	5.3 U	8 U	4.4 U	4.7 U	6.9 U	3.9 U
COBALT	**6.2** J	**9.6** J	6.6 U	6.7 U	4.2 U	6.6 U	7.7 U
COPPER	9.4 UJ	17.9 UJ	14 U	4.4 U	6.1 U	**5.9** J	**11.6** J
IRON	**19,600**	**16,500**	**7,780** J	**2,890**	**1,520**	**914**	**1,020**
LEAD	**22.4** J	**18.2** J	N/A	1.1 U	1.2 UJ	**1.5** J	0.8 U
MAGNESIUM	**176,000** J	**153,000**	**160,000**	**38,800** J	**30,400**	**26,600**	**32,200**
MANGANESE	**267** J	**303**	**310** J	**741** J	**369**	**298**	**270**
MERCURY	**0.25** J	0.11 U	0.13 U	0.2 U	0.2 U	0.2 U	0.2 U
MOLYBDENUM	1.3 UJ	5.1 U	7.7 U	**91.1**	**84.6** J	**92** J	**72.3**
NICKEL	**21.5** J	4.7 U	7.1 U	7.8 UJ	13.1 UJ	16.3 U	9.4 U
POTASSIUM	**508,000** J	**271,000**	**264,000** J	**27,200** J	**28,900** J	**33,800**	**42,300** J
SELENIUM	1 U	22 UJ	N/A	2.6 UJ	14 UJ	12 UJ	1 UJ
SILVER	0.5 U	2.6 U	3.9 U	N/A	4.5 U	3.8 U	2.1 U
SODIUM	**4,620,000**	**2,250,000**	**2,200,000**	**501,000**	**486,000**	**384,000**	**546,000**
THALLIUM	1.5 UJ	**50.5**	N/A	20 UJ	2 UJ	2.1 U	1.6 U
VANADIUM	**16** J	**11.2** J	4.8 U	5.6 U	4.6 U	10 UJ	7 U
ZINC	**342** J	**194** J	7.8 U	6.7 UJ	6.5 UJ	6.9 UJ	12.8 UJ

TABLE B-6 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, INORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-3	MW1-3	MW1-3	MW1-3	MW1-4	MW1-4	MW1-4
Sample ID:	273-S01-010	273-S01-011	273-S01-013	273-S01-014	273-S01-015	273-S01-016	273-S01-017
Sample Date:	07-FEB-94	10-MAY-94	02-AUG-94	31-OCT-94	06-FEB-94	11-MAY-94	08-AUG-94
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
DMETAL (ug/L)							
ALUMINUM	30.1 U	307 UJ	42.4 U	28.2 U	43.3 UJ	307 U	84.8 U
ANTIMONY	**13.3** J	**5.2** J	**8.4** J	12 U	66.7 UJ	9.8 UJ	18 U
ARSENIC	2 U	**8.5** J	**5.9** J	9 UJ	2.7 UJ	**6.5** J	**6.4** J
BARIUM	**175** J	**126** J	**75.2** J	**66.3** J	**88.9** J	**98** J	**91.3** J
BERYLLIUM	0.79 UJ	4 U	2.6 UJ	**2** J	1.1 U	4 U	2.2 U
BORON	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CADMIUM	2.9 U	27 UJ	3.6 U	3.5 U	2.2 U	27 U	7.2 UJ
CALCIUM	**346,000**	**420,000**	**419,000**	**403,000**	**403,000** J	**495,000**	**442,000**
CHROMIUM	**9.4** J	47 U	**10.4**	**7.8** J	4.4 U	47 U	13.8 U
COBALT	3.3 U	42 U	**6.8** J	7.7 U	6.7 U	42 U	13.2 U
COPPER	**8.7** J	61 UJ	**5.9** J	5.8 UJ	4.4 U	61 U	**10.6** J
IRON	**5,410** J	**20,000**	**23,300**	**26,500** J	**4,820**	**9,060**	**6,950**
LEAD	20 UJ	12 U	7 U	8 UJ	1.1 U	12 UJ	7 UJ
MAGNESIUM	**808,000**	**794,000**	**869,000**	**874,000**	**961,000** J	**1,060,000**	**1,040,000**
MANGANESE	**715**	**944**	**1,070**	**1,120**	**3,120** J	**3,140**	**2,590**
MERCURY	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
MOLYBDENUM	**234**	**114** J	49.6 UJ	**30.4** J	N/A	91 U	28 U
NICKEL	**9.2** J	**88.3** J	16.3 U	9.4 U	7.8 UJ	**136** J	32.6 U
POTASSIUM	**383,000**	**355,000**	**668,000** J	**643,000** J	**279,000** J	**310,000** J	**426,000**
SELENIUM	20 UJ	N/A	19 U	N/A	25.6 UJ	14 UJ	12 UJ
SILVER	5.3 U	45 U	3.8 U	2.1 U	5.6 UJ	45 U	7.6 U
SODIUM	**8,310,000**	**7,420,000**	**8,970,000**	**8,420,000**	**8,280,000**	**8,970,000**	**9,200,000**
THALLIUM	40 U	13 UJ	21 UJ	8 U	20 UJ	20 UJ	21 U
VANADIUM	3.8 U	**126** J	6.8 U	7 U	5.6 U	**64** J	13.6 U
ZINC	1.5 U	16 U	4 U	5.4 UJ	13.3 UJ	16 U	8 U

TABLE B-6 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, INORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-4	MW1-4	MW1-4	MW1-4	MW1-4	MW1-5R	MW1-5R
Sample ID:	273-S01-018	149-S01-015	149-S01-038	149-S01-056	149-S01-075	273-S01-028	273-S01-029
Sample Date:	02-NOV-94	21-MAY-98	24-AUG-98	09-NOV-98	09-FEB-99	06-FEB-94	03-MAY-94
Screen Depth (feet bgs):						7.0 to 17.0	7.0 to 17.0
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	UPLAND	UPLAND
DMETAL (ug/L)							
ALUMINUM	28.2 U	**267** J	**1,230**	135 U	108 U	30.1 U	30.7 U
ANTIMONY	12 U	7.8 UJ	**3**	50 U	40 U	**3.3** J	11.9 UJ
ARSENIC	**7.3** J	**8**	**6.9**	32.5 UJ	**35.1** J	2 U	1.1 U
BARIUM	**107** J	**462**	**382**	**438** J	**349** J	**1,660**	**1,400**
BERYLLIUM	**1.1** J	0.5 U	0.5 U	2.8 U	2.2 U	0.68 UJ	**1.9** J
BORON	N/A	**5,000**	N/A	N/A	N/A	N/A	N/A
CADMIUM	3.5 U	0.5 U	0.5 U	5.3 UJ	4.2 UJ	2.9 U	2.7 U
CALCIUM	**406,000**	**508,000**	**602,000** J	**470,000**	**499,000** J	**77,300**	**70,400**
CHROMIUM	3.9 U	2.1 UJ	**2.4** J	13.3 UJ	**22.8** J	**3.7** J	**4.9** J
COBALT	7.7 U	**1.5** J	**1.2** J	**12** J	8.8 U	3.3 U	4.2 U
COPPER	**10.7** J	1.5 UJ	**3.9**	**24.1** J	**55.5** J	**3.3** J	6.1 U
IRON	**8,320**	**8,900**	**9,400**	**8,020**	**1,760** J	**6,870** J	**3,800**
LEAD	0.8 U	1 U	**1.7**	20.3 U	16.2 U	2 UJ	**1.2** J
MAGNESIUM	**978,000**	**1,250,000**	**1,520,000**	**1,150,000**	**1,170,000**	**299,000**	**304,000**
MANGANESE	**2,560**	**1,970**	**1,940**	**2,190**	**2,050**	**145**	**117**
MERCURY	**0.2**	0.1 U	0.1 U	**0.18** J	0.11 U	0.2 U	0.2 U
MOLYBDENUM	25.4 U	**15.8**	**16.2**	12.8 U	**22.5** J	**13.6** J	9.1 U
NICKEL	9.4 U	**18.2** J	**18.2**	11.8 U	**44.1** J	6.8 U	16.9 UJ
POTASSIUM	**570,000** J	**370,000**	**442,000**	**406,000**	**429,000** J	**233,000**	**272,000** J
SELENIUM	10 UJ	1 UJ	1 U	55 UJ	44 UJ	2 UJ	1.9 UJ
SILVER	2.1 U	**0.59** J	0.5 U	6.5 UJ	**6.7** J	5.3 U	4.5 U
SODIUM	**8,410,000**	**9,180,000** J	**11,500,000** J	**9,690,000**	**8,800,000**	**2,860,000**	**3,040,000**
THALLIUM	16 U	1.5 UJ	1.5 UJ	**131**	26 UJ	4 U	1.3 UJ
VANADIUM	**7.2** J	**1.4** J	**4.2** J	8 UJ	6.4 UJ	3.8 U	4.6 U
ZINC	8.9 UJ	**97.5** J	**54.5**	**85.5** J	**45.7** J	5.2 UJ	1.6 U

TABLE B-6 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, INORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-5R	MW1-5R	MW1-5R	MW1-5R	MW1-5R	MW1-5R	MW1-6
Sample ID:	273-S01-030	273-S01-031	149-S01-016	149-S01-039	149-S01-057	149-S01-077	273-S01-019
Sample Date:	02-AUG-94	31-OCT-94	26-MAY-98	21-AUG-98	09-NOV-98	09-FEB-99	06-FEB-94
Screen Depth (feet bgs):	7.0 to 17.0	7.0 to 17.0	7.0 to 17.0	7.0 to 17.0	7.0 to 17.0	7.0 to 17.0	
ECO Habitat:	UPLAND	UPLAND	UPLAND	UPLAND	UPLAND	UPLAND	TIDAL MARSH
DMETAL (ug/L)							
ALUMINUM	42.4 U	28.2 U	30 UJ	66.5 UJ	**57.2** J	105 UJ	46.7 UJ
ANTIMONY	**4** J	**6.3** J	**3.8**	1.5 U	20 U	20 U	66.7 UJ
ARSENIC	1.5 U	**1.5** J	1.5 U	**2** J	13 U	13 U	26.7 UJ
BARIUM	**678**	**429**	**247**	**354** J	**997** J	**1,140** J	**75.6** J
BERYLLIUM	2.6 UJ	1 U	0.5 U	0.5 UJ	1.1 U	1.1 U	1.1 U
BORON	N/A	N/A	**3,800**	N/A	N/A	N/A	N/A
CADMIUM	3.6 U	3.5 U	0.5 U	0.5 UJ	2.1 U	2.1 U	2.2 U
CALCIUM	**139,000**	**149,000**	**43,700**	**37,100** J	**43,800** J	**50,800** J	**136,000** J
CHROMIUM	**13.5**	**7.9** J	**1.5** J	**2.8** J	5.3 UJ	6.1 UJ	4.4 U
COBALT	6.6 U	7.7 U	**0.74** J	0.5 UJ	**5** J	4.4 U	6.7 U
COPPER	4 U	2 U	2.5 UJ	2 UJ	12.9 UJ	9.3 U	4.4 U
IRON	**4,510**	**6,220** J	**314**	**860**	**518** J	45.2 UJ	**4,700**
LEAD	**23** J	8 UJ	1 U	1 UJ	8.1 U	8.1 U	1.1 U
MAGNESIUM	**648,000**	**682,000**	**144,000**	**136,000** J	**145,000**	**172,000**	**190,000** J
MANGANESE	**202**	**221**	**44.3**	**41.3** J	**56.9** J	**98.5** J	**490** J
MERCURY	0.2 U	0.2 U	0.1 U	0.1 U	0.11 U	0.11 U	0.2 U
MOLYBDENUM	14 U	12.7 U	**4.5** J	5.5 UJ	5.1 U	5.1 U	23.3 UJ
NICKEL	16.3 U	9.8 UJ	**10.4**	**11** J	4.7 U	**8.5** J	11.1 UJ
POTASSIUM	**511,000** J	**504,000** J	**162,000**	**317,000** J	**183,000**	**181,000** J	**101,000** J
SELENIUM	19 UJ	N/A	1 U	1 U	22 UJ	22 U	2.6 UJ
SILVER	3.8 U	2.1 U	0.5 U	0.5 U	2.6 U	2.6 U	N/A
SODIUM	**5,900,000**	**6,080,000**	**1,180,000**	**2,690,000**	**1,470,000**	**1,540,000**	**1,750,000**
THALLIUM	21 UJ	8 U	1.5 UJ	1.5 UJ	**50.3**	**37.6** J	**4** J
VANADIUM	6.8 U	7 U	**1.2** J	**1.6** J	3.2 U	3.2 U	5.6 U
ZINC	4 U	7.6 UJ	**109**	7 UJ	**44.3** J	**52.9** J	14.4 UJ

TABLE B-6 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, INORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-6	MW1-6	MW1-6	MW1-7	MW1-7	MW1-7	MW1-7
Sample ID:	273-S01-020	273-S01-021	273-S01-023	273-S01-024	273-S01-025	273-S01-026	273-S01-027
Sample Date:	03-MAY-94	02-AUG-94	31-OCT-94	06-FEB-94	11-MAY-94	08-AUG-94	02-NOV-94
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	UPLAND	UPLAND	UPLAND	UPLAND
DMETAL (ug/L)							
ALUMINUM	30.7 U	42.4 U	**236**	48.9 UJ	307 U	42.4 U	28.2 U
ANTIMONY	12.2 UJ	**4.5** J	**2.7** J	66.7 UJ	3 UJ	18 U	12 U
ARSENIC	**15.3**	**16.8**	**16.5** J	2.7 UJ	**5.2** J	**5.6** J	**4** J
BARIUM	**77.3** J	**72.9** J	**75** J	**152** J	**70.6** J	**201**	**225**
BERYLLIUM	**1.5** J	1.1 U	**1.3** J	1.1 U	4 U	1.9 UJ	1 U
BORON	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CADMIUM	2.7 U	3.6 U	3.5 U	**2.2** J	27 U	**3.9** J	3.5 U
CALCIUM	**159,000**	**144,000**	**154,000**	**364,000** J	**469,000**	**357,000**	**369,000**
CHROMIUM	4.7 U	6.9 U	**4** J	4.4 U	47 U	**12.8**	3.9 U
COBALT	4.2 U	6.6 U	7.7 U	6.7 U	42 U	**7.9** J	7.7 U
COPPER	6.1 U	4 U	3.7 UJ	4.4 U	61 U	**10.4** J	**16.2** J
IRON	**2,150**	**2,540**	**2,840** J	**3,130**	**10,900**	**4,470**	**4,750**
LEAD	1.2 UJ	0.7 U	**1.5** J	2.1 UJ	12 UJ	7 UJ	8 U
MAGNESIUM	**281,000**	**173,000**	**254,000**	**903,000** J	**1,150,000**	**828,000**	**842,000**
MANGANESE	**252**	**377**	**325**	**1,020** J	**1,310**	**1,060**	**1,130**
MERCURY	0.2 U	0.2 U	0.2 U	**0.64**	0.2 U	0.2 U	0.2 U
MOLYBDENUM	**22.1** J	26.2 UJ	**20** J	18.9 UJ	91 U	**33.5** J	**19.3** J
NICKEL	18.1 UJ	**19** J	9.4 U	10 UJ	**165** J	16.3 U	9.4 U
POTASSIUM	**160,000** J	**127,000** J	**160,000** J	**250,000** J	**346,000** J	**439,000**	**513,000** J
SELENIUM	1.9 U	1.9 U	N/A	2.6 UJ	14 UJ	60 UJ	10 UJ
SILVER	4.5 U	3.8 U	2.1 U	4.4 UJ	45 U	3.8 U	2.1 U
SODIUM	**2,670,000**	**1,520,000**	**2,170,000**	**7,740,000**	**9,700,000**	**7,890,000**	**7,410,000**
THALLIUM	1.3 U	2.1 UJ	0.8 UJ	20 UJ	20 UJ	21 U	16 U
VANADIUM	4.6 U	6.8 U	7 U	5.6 U	46 U	6.8 U	7 U
ZINC	1.6 U	4 U	8.9 UJ	10 UJ	16 U	16 U	10 UJ

TABLE B-6 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, INORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW	MW	MW
Point Name:	MW1-8	MW1-8	MW1-8	MW1-8	MW1-8	MW1-8	MW1-8
Sample ID:	273-S01-124	273-S01-126	273-S01-128	273-S01-130	149-S01-017	149-S01-040	149-S01-058
Sample Date:	06-FEB-94	11-MAY-94	08-AUG-94	02-NOV-94	27-MAY-98	24-AUG-98	06-NOV-98
Screen Depth (feet bgs):	6.0 to 17.0	6.0 to 17.0	6.0 to 17.0	6.0 to 17.0	6.0 to 17.0	6.0 to 17.0	6.0 to 17.0
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
DMETAL (ug/L)							
ALUMINUM	72.2 UJ	30.7 U	**522**	28.2 U	41.6 UJ	318 UJ	**57.3** J
ANTIMONY	66.7 UJ	7.7 UJ	1.8 U	**1.5** J	5.6 UJ	**2.3** J	10 U
ARSENIC	**7.8** J	**2.3** J	**6.2** J	**7.1** J	**3.3** J	**3.3** J	6.5 U
BARIUM	**304**	**82.9** J	**190** J	**141** J	**273**	**84.5** J	**341** J
BERYLLIUM	1.1 U	0.4 U	1.1 U	1 U	0.5 U	0.5 U	0.55 U
BORON	N/A	N/A	N/A	N/A	**1,130**	N/A	N/A
CADMIUM	2.2 U	2.7 U	3.6 UJ	3.5 U	**0.74** J	**1.9** J	1.1 U
CALCIUM	**161,000** J	**238,000**	**210,000**	**157,000**	**249,000**	**346,000** J	**295,000**
CHROMIUM	4.4 U	4.7 U	**8** J	3.9 U	13.4 UJ	**1.5** J	2.7 U
COBALT	6.7 U	4.2 U	**7.9** J	7.7 U	**5.4** J	**11.6** J	**12.5** J
COPPER	4.4 U	11.5 UJ	**7.5** J	**7.6** J	**12**	**11**	13.9 UJ
IRON	**816**	23.7 UJ	**2,060**	**1,030**	202 UJ	**660**	**218** J
LEAD	1.1 U	1.2 UJ	**1.8** J	**1.1** J	1 U	1 U	4.1 U
MAGNESIUM	**239,000** J	**159,000**	**279,000**	**220,000**	**117,000**	**190,000**	**212,000**
MANGANESE	**1,500** J	**189**	**1,150**	**951**	**1,820**	**1,590**	**3,470**
MERCURY	**0.59**	0.2 U	0.2 U	**1.6**	**0.11** J	0.1 U	0.11 U
MOLYBDENUM	**57.8**	45.2 UJ	**30.2** J	**39.8** J	**14.4**	**16.2**	**35**
NICKEL	26.7 UJ	27 UJ	**35** J	**22.9** J	61.5 UJ	**78.5**	**105**
POTASSIUM	**130,000** J	**103,000** J	**216,000**	**178,000** J	**46,600** J	**85,500**	**114,000**
SELENIUM	25.6 UJ	14 UJ	12 UJ	1 UJ	1.6 UJ	1 U	11 UJ
SILVER	N/A	4.5 U	3.8 U	2.1 U	**0.58** J	0.5 U	1.3 U
SODIUM	**3,190,000**	**1,540,000**	**3,840,000**	**2,850,000**	**835,000** J	**1,520,000** J	**2,190,000**
THALLIUM	2 UJ	2 UJ	2.1 UJ	16 U	1.5 UJ	1.5 UJ	**30.2**
VANADIUM	12.2 UJ	4.6 U	21 UJ	**9.5** J	4.3 UJ	**4** J	**3.2** J
ZINC	**30**	4.3 UJ	4 U	9.9 UJ	**124**	8.7 UJ	**139**

TABLE B-6 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, INORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	MW	MW	MW	MW	MW
Point Name:	MW1-8	MW1-9	MW1-9	MW1-9	MW1-9
Sample ID:	149-S01-078	273-S01-125	273-S01-127	273-S01-129	273-S01-131
Sample Date:	09-FEB-99	06-FEB-94	11-MAY-94	09-AUG-94	02-NOV-94
Screen Depth (feet bgs):	6.0 to 17.0	3.0 to 13.0	3.0 to 13.0	3.0 to 13.0	3.0 to 13.0
ECO Habitat:	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
DMETAL (ug/L)					
ALUMINUM	**776**	22.2 U	30.7 U	42.4 U	28.2 U
ANTIMONY	10 U	66.7 UJ	3.9 UJ	2.9 UJ	6 U
ARSENIC	**7.8** J	2.7 UJ	**2.4** J	**3** J	**2.7** J
BARIUM	**235** J	**76.7** J	**77.2** J	**57.3** J	**87** J
BERYLLIUM	0.55 U	1.1 U	0.4 U	1.1 UJ	1 U
BORON	N/A	N/A	N/A	N/A	N/A
CADMIUM	1.1 U	2.2 U	2.7 U	3.6 U	3.5 U
CALCIUM	**215,000** J	**231,000** J	**266,000**	**141,000**	**269,000**
CHROMIUM	**15.3** J	4.4 U	**11**	**7.7** J	3.9 U
COBALT	**15.6** J	6.7 U	**6.6** J	**12** J	7.7 U
COPPER	16.9 UJ	4.4 UJ	9.4 UJ	17.9 UJ	**21.1** J
IRON	**319** J	**1,280**	101 UJ	12.2 UJ	86.5 UJ
LEAD	5.4 UJ	1.1 UJ	12 UJ	7 U	**17.2**
MAGNESIUM	**217,000**	**551,000** J	**526,000**	**309,000**	**524,000**
MANGANESE	**7,540**	**797** J	**315**	**249**	**264**
MERCURY	0.11 U	0.2 U	0.2 U	0.2 U	0.2 U
MOLYBDENUM	**45.1**	**65.6**	**70.7** J	**46.9** J	**68.3**
NICKEL	**82.9**	**13.3** J	22.9 UJ	16.3 U	9.4 U
POTASSIUM	**113,000** J	**214,000** J	**327,000** J	**198,000**	**362,000** J
SELENIUM	11 U	2.6 UJ	14 UJ	N/A	1 UJ
SILVER	3.4 UJ	N/A	4.5 U	3.8 U	2.1 U
SODIUM	**1,820,000**	**5,680,000**	**5,790,000**	**3,560,000**	**5,330,000**
THALLIUM	**19.9** J	20 UJ	20 UJ	0.6 U	16 U
VANADIUM	**3.7** J	5.6 U	4.6 U	12.4 UJ	7 U
ZINC	**66.9** J	**38.9**	16 U	4 U	10.3 UJ

TABLE B-6 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN GROUNDWATER, INORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Notes and Abbreviations:
- Detections appear in boldface type
- bgs - Below ground surface
- J - Estimated concentration
- MW - Monitoring well
- NA - Not analyzed
- U - Not detected
- ug/L - Micrograms per liter

TABLE B-7

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL	SL	SL
Point Name:	SW11-60	SW11-60	SW11-60	SW11-60	SW11-61	SW11-61	SW11-61
Sample ID:	149-S11-022	149-S11-056	149-S11-080	149-S11-104	149-S11-023	149-S11-057	149-S11-081
Sample Date:	02-JUN-98	20-AUG-98	04-NOV-98	03-FEB-99	02-JUN-98	20-AUG-98	04-NOV-98
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK
PEST (ug/L)							
4,4'-DDD	0.02 U	0.02 UJ	0.1 U	0.1 U	0.02 U	0.02 UJ	0.1 U
4,4'-DDE	**0.007** J	0.02 UJ	0.1 U	0.1 U	**0.01** J	0.02 UJ	0.1 U
4,4'-DDT	0.02 UJ	0.02 UJ	0.1 U	0.1 U	0.02 UJ	0.02 UJ	0.1 U
ALDRIN	0.01 U	0.01 UJ	0.05 U	0.05 U	0.01 U	0.01 UJ	0.05 U
ALPHA-BHC	0.01 U	**0.007** J	0.05 U	0.05 U	0.01 U	0.01 UJ	0.05 U
ALPHA-CHLORDANE	0.01 U	0.01 UJ	0.05 U	0.05 U	0.01 U	0.01 UJ	0.05 U
AROCLOR-1016	0.2 U	0.2 UJ	0.5 U	1 U	0.2 U	0.2 UJ	0.5 U
AROCLOR-1221	0.4 U	0.4 UJ	0.5 U	2 U	0.4 U	0.4 UJ	0.5 U
AROCLOR-1232	0.2 U	0.2 UJ	0.5 U	1 U	0.2 U	0.2 UJ	0.5 U
AROCLOR-1242	0.2 U	0.2 UJ	0.5 U	1 U	0.2 U	0.2 UJ	0.5 U
AROCLOR-1248	0.2 U	0.2 UJ	0.5 U	1 U	0.2 U	0.2 UJ	0.5 U
AROCLOR-1254	0.2 U	0.2 UJ	0.5 U	1 U	0.2 U	0.2 UJ	0.5 U
AROCLOR-1260	0.2 U	0.2 UJ	0.5 U	1 U	0.2 U	0.2 UJ	0.5 U
BETA-BHC	0.01 U	0.01 UJ	0.05 U	0.05 U	0.01 U	0.01 UJ	0.05 U
DELTA-BHC	0.01 U	0.01 UJ	0.05 U	0.05 U	0.01 U	0.01 UJ	0.05 U
DIELDRIN	0.02 U	0.02 UJ	0.1 U	0.1 U	0.02 U	0.02 UJ	0.1 U
ENDOSULFAN I	0.01 U	0.01 UJ	0.05 U	0.05 U	0.01 U	0.01 UJ	0.05 U
ENDOSULFAN II	0.02 U	0.02 UJ	0.1 U	0.1 U	0.02 U	0.02 UJ	0.1 U
ENDOSULFAN SULFATE	0.02 U	0.02 UJ	0.1 U	0.1 U	0.02 U	0.02 UJ	0.1 U
ENDRIN	0.02 U	0.02 UJ	0.1 U	0.1 U	0.02 U	0.02 UJ	0.1 U
ENDRIN ALDEHYDE	0.02 U	0.02 UJ	0.1 U	0.1 U	0.02 U	0.02 UJ	0.1 U
ENDRIN KETONE	0.02 U	0.02 UJ	0.1 U	0.1 U	0.02 U	0.02 UJ	0.1 U
GAMMA-BHC (LINDANE)	0.01 U	0.01 UJ	**0.039** J	0.05 U	0.01 U	0.01 UJ	0.05 U
GAMMA-CHLORDANE	0.01 U	0.01 UJ	0.05 U	0.05 U	0.01 U	0.01 UJ	0.05 U
HEPTACHLOR	0.01 U	0.01 UJ	0.01 U	0.05 U	0.01 U	0.01 UJ	0.01 U
HEPTACHLOR EPOXIDE	0.01 U	0.01 UJ	0.01 U	0.05 U	0.01 U	0.01 UJ	0.01 U
METHOXYCHLOR	0.1 U	0.1 UJ	0.5 U	0.5 U	0.1 U	0.1 UJ	0.5 U
TOXAPHENE	1 U	1 UJ	3 U	5 U	1 U	1 UJ	3 U
SOLIDS (mg/L)							
TOTAL DISSOLVED SOLIDS	**3,800**	**13,500**	**29,500**	**20,000**	**38,700** J	**36,800**	**37,700**
TOTAL SUSPENDED SOLIDS	N/A	**185**	**110** J	**57**	N/A	**64**	**110** J
SVOA (ug/L)							
1,2,4-TRICHLOROBENZENE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
1,2-DICHLOROBENZENE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
1,3-DICHLOROBENZENE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
1,4-DICHLOROBENZENE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
2,2'-OXYBIS(1-CHLOROPROPANE)	1 U	N/A	N/A	N/A	1 U	N/A	N/A

TABLE B-7 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL	SL	SL
Point Name:	SW11-61	SW11-62	SW11-63	SW11-63	SW11-63	SW11-64	SW11-64
Sample ID:	149-S11-105	149-S11-025	149-S11-026	149-S11-059	149-S11-106	149-S11-027	149-S11-060
Sample Date:	03-FEB-99	02-JUN-98	02-JUN-98	19-AUG-98	03-FEB-99	02-JUN-98	20-AUG-98
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL CREEK	MUDFLAT	MUDFLAT	MUDFLAT	MUDFLAT	MUDFLAT	MUDFLAT
PEST (ug/L)							
4,4'-DDD	0.1 U	0.02 U	0.02 U	0.02 U	0.1 U	0.02 U	0.02 UJ
4,4'-DDE	0.1 U	**0.005** J	**0.01** J	**0.004** J	0.1 U	**0.006** J	0.02 UJ
4,4'-DDT	0.1 U	0.02 UJ	0.02 UJ	0.02 U	0.1 U	0.02 UJ	0.02 UJ
ALDRIN	0.05 U	0.01 U	0.01 U	0.01 U	0.05 U	0.01 U	0.01 UJ
ALPHA-BHC	0.05 U	0.01 U	0.01 U	0.01 U	0.05 U	0.01 U	0.01 UJ
ALPHA-CHLORDANE	0.05 U	0.01 U	0.01 U	0.01 U	0.05 U	0.01 U	0.01 UJ
AROCLOR-1016	1 U	0.2 U	0.2 U	0.2 U	1 U	0.2 U	0.2 UJ
AROCLOR-1221	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U	0.4 UJ
AROCLOR-1232	1 U	0.2 U	0.2 U	0.2 U	1 U	0.2 U	0.2 UJ
AROCLOR-1242	1 U	0.2 U	0.2 U	0.2 U	1 U	0.2 U	0.2 UJ
AROCLOR-1248	1 U	0.2 U	0.2 U	0.2 U	1 U	0.2 U	0.2 UJ
AROCLOR-1254	1 U	0.2 U	0.2 U	0.2 U	1 U	0.2 U	0.2 UJ
AROCLOR-1260	1 U	0.2 U	0.2 U	0.2 U	1 U	0.2 U	0.2 UJ
BETA-BHC	0.05 U	0.01 U	0.01 U	0.01 U	0.05 U	0.01 U	0.01 UJ
DELTA-BHC	0.05 U	0.01 U	0.01 U	0.01 U	0.05 U	0.01 U	0.01 UJ
DIELDRIN	0.1 U	0.02 U	0.02 U	0.02 U	0.1 U	0.02 U	0.02 UJ
ENDOSULFAN I	0.05 U	0.01 U	0.01 U	0.01 U	0.05 U	0.01 U	0.01 UJ
ENDOSULFAN II	0.1 U	0.02 U	0.02 U	0.02 U	0.1 U	0.02 U	0.02 UJ
ENDOSULFAN SULFATE	0.1 U	0.02 U	0.02 U	0.02 U	0.1 U	0.02 U	0.02 UJ
ENDRIN	0.1 U	0.02 U	0.02 U	0.02 U	0.1 U	0.02 U	0.02 UJ
ENDRIN ALDEHYDE	0.1 U	0.02 U	0.02 U	0.02 U	0.1 U	0.02 U	0.02 UJ
ENDRIN KETONE	0.1 U	0.02 U	0.02 U	0.02 U	0.1 U	0.02 U	0.02 UJ
GAMMA-BHC (LINDANE)	0.05 U	0.01 U	0.01 U	0.01 U	0.05 U	0.01 U	0.01 UJ
GAMMA-CHLORDANE	0.05 U	0.01 U	0.01 U	0.01 U	0.05 U	0.01 U	0.01 UJ
HEPTACHLOR	0.05 U	0.01 U	0.01 U	0.01 U	0.05 U	0.01 U	0.01 UJ
HEPTACHLOR EPOXIDE	0.05 U	0.01 U	0.01 U	0.01 U	0.05 U	0.01 U	0.01 UJ
METHOXYCHLOR	0.5 U	0.1 U	0.1 U	0.1 U	0.5 U	0.1 U	0.1 UJ
TOXAPHENE	5 U	1 U	1 U	1 U	5 U	1 U	1 UJ
SOLIDS (mg/L)							
TOTAL DISSOLVED SOLIDS	**30,900**	**31,800** J	**34,700** J	**34,300**	**36,900**	**31,200** J	**32,900**
TOTAL SUSPENDED SOLIDS	**200**	N/A	N/A	**48**	**74**	N/A	**25**
SVOA (ug/L)							
1,2,4-TRICHLOROBENZENE	N/A	1 U	1 U	N/A	N/A	1 U	N/A
1,2-DICHLOROBENZENE	N/A	1 U	1 U	N/A	N/A	1 U	N/A
1,3-DICHLOROBENZENE	N/A	1 U	1 U	N/A	N/A	1 U	N/A
1,4-DICHLOROBENZENE	N/A	1 U	1 U	N/A	N/A	1 U	N/A
2,2'-OXYBIS(1-CHLOROPROPANE)	N/A	1 U	1 U	N/A	N/A	1 U	N/A

TABLE B-7 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL	SL	SL
Point Name:	SW11-64	SW11-64	SW11-66	SW11-66	SW11-66	SW11-66	SW11-67
Sample ID:	149-S11-083	149-S11-107	149-S11-029	149-S11-063	149-S11-084	149-S11-108	149-S11-030
Sample Date:	04-NOV-98	03-FEB-99	02-JUN-98	20-AUG-98	04-NOV-98	03-FEB-99	02-JUN-98
Screen Depth (feet bgs):							
ECO Habitat:	MUDFLAT	MUDFLAT	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL CREEK
PEST (ug/L)							
4,4'-DDD	0.1 U	0.1 U	0.02 U	0.02 UJ	0.1 U	0.1 U	0.02 U
4,4'-DDE	0.1 U	0.1 U	0.02 U	0.02 UJ	0.1 U	0.1 U	**0.004** J
4,4'-DDT	0.1 U	0.1 U	0.02 UJ	0.02 UJ	0.1 U	0.1 U	0.02 UJ
ALDRIN	0.05 U	0.05 U	0.01 U	0.01 UJ	0.05 U	0.05 U	0.01 U
ALPHA-BHC	0.05 U	0.05 U	0.01 U	0.01 UJ	0.05 U	0.05 U	0.01 U
ALPHA-CHLORDANE	0.05 U	0.05 U	0.01 U	0.01 UJ	0.05 U	0.05 U	0.01 U
AROCLOR-1016	0.5 U	1 U	0.2 U	0.2 UJ	0.5 U	1 U	0.2 U
AROCLOR-1221	0.5 U	2 U	0.4 U	0.4 UJ	0.5 U	2 U	0.4 U
AROCLOR-1232	0.5 U	1 U	0.2 U	0.2 UJ	0.5 U	1 U	0.2 U
AROCLOR-1242	0.5 U	1 U	0.2 U	0.2 UJ	0.5 U	1 U	0.2 U
AROCLOR-1248	0.5 U	1 U	0.2 U	0.2 UJ	0.5 U	1 U	0.2 U
AROCLOR-1254	0.5 U	1 U	0.2 U	0.2 UJ	0.5 U	1 U	0.2 U
AROCLOR-1260	0.5 U	1 U	0.2 U	0.2 UJ	0.5 U	1 U	0.2 U
BETA-BHC	0.05 U	0.05 U	0.01 U	0.01 UJ	0.05 U	0.05 U	0.01 U
DELTA-BHC	0.05 U	0.05 U	0.01 U	0.01 UJ	0.05 U	0.05 U	0.01 U
DIELDRIN	0.1 U	0.1 U	0.02 U	0.02 UJ	0.1 U	0.1 U	0.02 U
ENDOSULFAN I	0.05 U	0.05 U	0.01 U	0.01 UJ	0.05 U	0.05 U	0.01 U
ENDOSULFAN II	0.1 U	0.1 U	0.02 U	0.02 UJ	0.1 U	0.1 U	0.02 U
ENDOSULFAN SULFATE	0.1 U	0.1 U	0.02 U	**0.002** J	0.1 U	0.1 U	0.02 U
ENDRIN	0.1 U	0.1 U	0.02 U	0.02 UJ	0.1 U	0.1 U	0.02 U
ENDRIN ALDEHYDE	0.1 U	0.1 U	0.02 U	0.02 UJ	0.1 U	0.1 U	0.02 U
ENDRIN KETONE	0.1 U	0.1 U	0.02 U	0.02 UJ	0.1 U	0.1 U	0.02 U
GAMMA-BHC (LINDANE)	0.05 U	0.05 U	0.01 U	0.01 UJ	0.05 U	0.05 U	0.01 U
GAMMA-CHLORDANE	0.05 U	0.05 U	0.01 U	0.01 UJ	0.05 U	0.05 U	0.01 U
HEPTACHLOR	0.01 U	0.05 U	0.01 U	0.01 UJ	0.01 U	0.05 U	0.01 U
HEPTACHLOR EPOXIDE	0.01 U	0.05 U	0.01 U	0.01 UJ	0.01 U	0.05 U	0.01 U
METHOXYCHLOR	0.5 U	0.5 U	0.1 U	0.1 UJ	0.5 U	0.5 U	0.1 U
TOXAPHENE	3 U	5 U	1 U	1 UJ	3 U	5 U	1 U
SOLIDS (mg/L)							
TOTAL DISSOLVED SOLIDS	**35,800**	**35,500**	**58,800** J	**46,800**	**46,900**	**37,300**	**33,400** J
TOTAL SUSPENDED SOLIDS	**87** J	**110**	N/A	**39**	**130** J	**55**	N/A
SVOA (ug/L)							
1,2,4-TRICHLOROBENZENE	N/A	N/A	1 U	N/A	N/A	N/A	1 U
1,2-DICHLOROBENZENE	N/A	N/A	1 U	N/A	N/A	N/A	1 U
1,3-DICHLOROBENZENE	N/A	N/A	1 U	N/A	N/A	N/A	1 U
1,4-DICHLOROBENZENE	N/A	N/A	1 U	N/A	N/A	N/A	1 U
2,2'-OXYBIS(1-CHLOROPROPANE)	N/A	N/A	1 U	N/A	N/A	N/A	1 U

TABLE B-7 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL	SL	SL
Point Name:	SW11-67	SW11-67	SW11-67	SW11-68	SW11-68	SW11-68	SW11-68
Sample ID:	149-S11-064	149-S11-085	149-S11-109	149-S11-031	149-S11-065	149-S11-086	149-S11-110
Sample Date:	20-AUG-98	04-NOV-98	03-FEB-99	02-JUN-98	20-AUG-98	04-NOV-98	03-FEB-99
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK
PEST (ug/L)							
4,4'-DDD	0.02 UJ	0.1 U	0.1 U	0.02 U	0.02 UJ	0.1 U	0.1 U
4,4'-DDE	0.02 UJ	0.1 U	0.1 U	0.02 U	0.02 UJ	0.1 U	0.1 U
4,4'-DDT	0.02 UJ	0.1 U	0.1 U	0.02 UJ	0.02 UJ	0.1 U	0.1 U
ALDRIN	0.01 UJ	0.05 U	0.05 U	0.01 U	0.01 UJ	0.05 U	0.05 U
ALPHA-BHC	0.01 UJ	0.05 U	0.05 U	0.01 U	0.01 UJ	0.05 U	0.05 U
ALPHA-CHLORDANE	0.01 UJ	0.05 U	0.05 U	0.01 U	0.01 UJ	0.05 U	0.05 U
AROCLOR-1016	0.2 UJ	0.5 U	1 U	0.2 U	0.2 UJ	0.5 U	1 U
AROCLOR-1221	0.4 UJ	0.5 U	2 U	0.4 U	0.4 UJ	0.5 U	2 U
AROCLOR-1232	0.2 UJ	0.5 U	1 U	0.2 U	0.2 UJ	0.5 U	1 U
AROCLOR-1242	0.2 UJ	0.5 U	1 U	0.2 U	0.2 UJ	0.5 U	1 U
AROCLOR-1248	0.2 UJ	0.5 U	1 U	0.2 U	0.2 UJ	0.5 U	1 U
AROCLOR-1254	0.2 UJ	0.5 U	1 U	0.2 U	0.2 UJ	0.5 U	1 U
AROCLOR-1260	0.2 UJ	0.5 U	1 U	0.2 U	0.2 UJ	0.5 U	1 U
BETA-BHC	0.01 UJ	0.05 U	0.05 U	0.01 U	0.01 UJ	0.05 U	0.05 U
DELTA-BHC	0.01 UJ	0.05 U	0.05 U	0.01 U	0.01 UJ	0.05 U	0.05 U
DIELDRIN	0.02 UJ	0.1 U	0.1 U	0.02 U	0.02 UJ	0.1 U	0.1 U
ENDOSULFAN I	0.01 UJ	0.05 U	0.05 U	0.01 U	0.01 UJ	0.05 U	0.05 U
ENDOSULFAN II	0.02 UJ	0.1 U	0.1 U	0.02 U	0.02 UJ	0.1 U	0.1 U
ENDOSULFAN SULFATE	0.02 UJ	0.1 U	0.1 U	0.02 U	0.02 UJ	0.1 U	0.1 U
ENDRIN	0.02 UJ	0.1 U	0.1 U	0.02 U	0.02 UJ	0.1 U	0.1 U
ENDRIN ALDEHYDE	0.02 UJ	0.1 U	0.1 U	0.02 U	0.02 UJ	0.1 U	0.1 U
ENDRIN KETONE	0.02 UJ	0.1 U	0.1 U	0.02 U	0.02 UJ	0.1 U	0.1 U
GAMMA-BHC (LINDANE)	0.01 UJ	0.05 U	0.05 U	0.01 U	0.01 UJ	0.05 U	0.05 U
GAMMA-CHLORDANE	0.01 UJ	**0.031** J	0.05 U	0.01 U	0.01 UJ	0.05 U	0.05 U
HEPTACHLOR	0.01 UJ	0.01 U	0.05 U	0.01 U	0.01 UJ	0.01 U	0.05 U
HEPTACHLOR EPOXIDE	0.01 UJ	0.01 U	0.05 U	0.01 U	0.01 UJ	0.01 U	0.05 U
METHOXYCHLOR	0.1 UJ	0.5 U	0.5 U	0.1 U	0.1 UJ	0.5 U	0.5 U
TOXAPHENE	1 UJ	3 U	5 U	1 U	1 UJ	3 U	5 U
SOLIDS (mg/L)							
TOTAL DISSOLVED SOLIDS	**37,300**	**52,000**	**29,300**	**17,500** J	**35,200**	**37,200**	**31,000**
TOTAL SUSPENDED SOLIDS	**94**	**110** J	**72**	N/A	**33**	**110** J	**50**
SVOA (ug/L)							
1,2,4-TRICHLOROBENZENE	N/A	N/A	N/A	1 U	N/A	N/A	N/A
1,2-DICHLOROBENZENE	N/A	N/A	N/A	1 U	N/A	N/A	N/A
1,3-DICHLOROBENZENE	N/A	N/A	N/A	1 U	N/A	N/A	N/A
1,4-DICHLOROBENZENE	N/A	N/A	N/A	1 U	N/A	N/A	N/A
2,2'-OXYBIS(1-CHLOROPROPANE)	N/A	N/A	N/A	1 U	N/A	N/A	N/A

TABLE B-7 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL	SL	SL
Point Name:	SW11-69	SW11-69	SW11-69	SW11-69	SW11-70	SW11-70	SW11-70
Sample ID:	149-S11-032	149-S11-066	149-S11-087	149-S11-111	149-S11-033	149-S11-067	149-S11-088
Sample Date:	02-JUN-98	20-AUG-98	04-NOV-98	03-FEB-99	02-JUN-98	19-AUG-98	04-NOV-98
Screen Depth (feet bgs):							
ECO Habitat:	MUDFLAT	MUDFLAT	MUDFLAT	MUDFLAT	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
PEST (ug/L)							
4,4'-DDD	0.02 U	0.02 UJ	0.1 U	0.1 U	**0.006** J	0.02 U	0.1 U
4,4'-DDE	0.02 U	0.02 UJ	0.1 U	0.1 U	**0.01** J	**0.01** J	0.1 U
4,4'-DDT	0.02 UJ	0.02 UJ	0.1 U	0.1 U	0.02 UJ	0.02 U	0.1 U
ALDRIN	0.01 U	0.01 UJ	0.05 U	0.05 U	0.01 U	0.01 U	0.05 U
ALPHA-BHC	0.01 U	0.01 UJ	0.05 U	0.05 U	0.01 U	0.01 U	0.05 U
ALPHA-CHLORDANE	0.01 U	0.01 UJ	0.05 U	0.05 U	0.01 U	0.01 U	0.05 U
AROCLOR-1016	0.2 U	0.2 UJ	0.5 U	1 U	0.2 U	0.2 U	0.5 U
AROCLOR-1221	0.4 U	0.4 UJ	0.5 U	2 U	0.4 U	0.4 U	0.5 U
AROCLOR-1232	0.2 U	0.2 UJ	0.5 U	1 U	0.2 U	0.2 U	0.5 U
AROCLOR-1242	0.2 U	0.2 UJ	0.5 U	1 U	0.2 U	0.2 U	0.5 U
AROCLOR-1248	0.2 U	0.2 UJ	0.5 U	1 U	0.2 U	0.2 U	0.5 U
AROCLOR-1254	0.2 U	0.2 UJ	0.5 U	1 U	0.2 U	0.2 U	0.5 U
AROCLOR-1260	0.2 U	0.2 UJ	0.5 U	1 U	0.2 U	0.2 U	0.5 U
BETA-BHC	0.01 U	0.01 UJ	0.05 U	0.05 U	0.01 U	0.01 U	0.05 U
DELTA-BHC	0.01 U	0.01 UJ	0.05 U	0.05 U	0.01 U	0.01 U	0.05 U
DIELDRIN	0.02 U	0.02 UJ	0.1 U	0.1 U	0.02 U	0.02 U	0.1 U
ENDOSULFAN I	0.01 U	0.01 UJ	0.05 U	0.05 U	0.01 U	0.01 U	0.05 U
ENDOSULFAN II	0.02 U	0.02 UJ	0.1 U	0.1 U	0.02 U	0.02 U	0.1 U
ENDOSULFAN SULFATE	0.02 U	0.02 UJ	0.1 U	0.1 U	0.02 U	0.02 U	0.1 U
ENDRIN	0.02 U	0.02 UJ	0.1 U	0.1 U	0.02 U	0.02 U	0.1 U
ENDRIN ALDEHYDE	0.02 U	0.02 UJ	0.1 U	0.1 U	0.02 U	0.02 U	0.1 U
ENDRIN KETONE	0.02 U	0.02 UJ	0.1 U	0.1 U	0.02 U	0.02 U	0.1 U
GAMMA-BHC (LINDANE)	0.01 U	0.01 UJ	0.05 U	0.05 U	0.01 U	0.01 U	0.05 U
GAMMA-CHLORDANE	0.01 U	0.01 UJ	0.05 U	0.05 U	0.01 U	0.01 U	0.05 U
HEPTACHLOR	0.01 U	0.01 UJ	0.01 U	0.05 U	0.01 U	0.01 U	**0.013** J
HEPTACHLOR EPOXIDE	0.01 U	0.01 UJ	0.01 U	0.05 U	0.01 U	0.01 U	**0.013**
METHOXYCHLOR	0.1 U	0.1 UJ	0.5 U	0.5 U	0.1 U	0.1 U	0.5 U
TOXAPHENE	1 U	1 UJ	3 U	5 U	1 U	1 U	3 U
SOLIDS (mg/L)							
TOTAL DISSOLVED SOLIDS	**35,000** J	**38,300**	**33,900** J	**30,900**	**6,900**	**18,300**	**27,800**
TOTAL SUSPENDED SOLIDS	N/A	**38**	**62** J	**61**	N/A	**792**	**79** J
SVOA (ug/L)							
1,2,4-TRICHLOROBENZENE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
1,2-DICHLOROBENZENE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
1,3-DICHLOROBENZENE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
1,4-DICHLOROBENZENE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
2,2'-OXYBIS(1-CHLOROPROPANE)	1 U	N/A	N/A	N/A	1 U	N/A	N/A

TABLE B-7 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL
Point Name:	SW11-70	SW11-75	SW11-75	SW11-75	SW11-75
Sample ID:	149-S11-112	149-S11-039	149-S11-073	149-S11-094	149-S11-118
Sample Date:	03-FEB-99	03-JUN-98	19-AUG-98	06-NOV-98	03-FEB-99
Screen Depth (feet bgs):					
ECO Habitat:	TIDAL MARSH	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK
PEST (ug/L)					
4,4'-DDD	0.1 U	0.02 U	0.02 U	0.1 U	0.1 U
4,4'-DDE	0.1 U	**0.01** J	**0.009** J	0.1 U	0.1 U
4,4'-DDT	0.1 U	**0.02** J	0.02 U	0.1 U	0.1 U
ALDRIN	0.05 U	0.01 U	0.01 U	0.05 U	0.05 U
ALPHA-BHC	0.05 U	0.01 U	0.01 U	0.05 U	0.05 U
ALPHA-CHLORDANE	0.05 U	0.01 U	**0.002** J	0.05 U	0.05 U
AROCLOR-1016	1 U	0.2 U	0.2 U	0.5 U	1 U
AROCLOR-1221	2 U	0.4 U	0.4 U	0.5 U	2 U
AROCLOR-1232	1 U	0.2 U	0.2 U	0.5 U	1 U
AROCLOR-1242	1 U	0.2 U	0.2 U	0.5 U	1 U
AROCLOR-1248	1 U	0.2 U	0.2 U	0.5 U	1 U
AROCLOR-1254	1 U	0.2 U	0.2 U	0.5 U	1 U
AROCLOR-1260	1 U	0.2 U	0.2 U	0.5 U	1 U
BETA-BHC	0.05 U	0.01 U	0.01 U	0.05 U	0.05 U
DELTA-BHC	0.05 U	0.01 U	0.01 U	0.05 U	0.05 U
DIELDRIN	0.1 U	0.02 U	0.02 U	0.1 U	0.1 U
ENDOSULFAN I	0.05 U	0.01 U	0.01 U	0.05 U	0.05 U
ENDOSULFAN II	0.1 U	0.02 U	0.02 U	0.1 U	0.1 U
ENDOSULFAN SULFATE	0.1 U	0.02 U	0.02 U	0.1 U	0.1 U
ENDRIN	0.1 U	0.02 U	0.02 U	0.1 U	0.1 U
ENDRIN ALDEHYDE	0.1 U	0.02 U	0.02 U	0.1 U	0.1 U
ENDRIN KETONE	0.1 U	0.02 U	0.02 U	0.1 U	0.1 U
GAMMA-BHC (LINDANE)	0.05 U	0.01 U	0.01 U	**0.88** J	0.05 U
GAMMA-CHLORDANE	0.05 U	0.01 U	0.01 U	**0.04** J	0.05 U
HEPTACHLOR	0.05 U	0.01 U	0.01 U	0.01 U	0.05 U
HEPTACHLOR EPOXIDE	0.05 U	0.01 U	0.01 U	0.01 U	0.05 U
METHOXYCHLOR	0.5 U	0.1 U	0.1 U	0.5 U	0.5 U
TOXAPHENE	5 U	1 U	1 U	3 U	5 U
SOLIDS (mg/L)					
TOTAL DISSOLVED SOLIDS	**10,000**	**3,740**	**3,510**	**3,350**	**8,450**
TOTAL SUSPENDED SOLIDS	**30**	N/A	**126**	**14** J	**21**
SVOA (ug/L)					
1,2,4-TRICHLOROBENZENE	N/A	1 U	N/A	N/A	N/A
1,2-DICHLOROBENZENE	N/A	1 U	N/A	N/A	N/A
1,3-DICHLOROBENZENE	N/A	1 U	N/A	N/A	N/A
1,4-DICHLOROBENZENE	N/A	1 U	N/A	N/A	N/A
2,2'-OXYBIS(1-CHLOROPROPANE)	N/A	1 U	N/A	N/A	N/A

TABLE B-7 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL	SL	SL
Point Name:	SW11-60	SW11-60	SW11-60	SW11-60	SW11-61	SW11-61	SW11-61
Sample ID:	149-S11-022	149-S11-056	149-S11-080	149-S11-104	149-S11-023	149-S11-057	149-S11-081
Sample Date:	02-JUN-98	20-AUG-98	04-NOV-98	03-FEB-99	02-JUN-98	20-AUG-98	04-NOV-98
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK
SVOA (ug/L)							
2,4,5-TRICHLOROPHENOL	2 U	N/A	N/A	N/A	2 U	N/A	N/A
2,4,6-TRICHLOROPHENOL	2 U	N/A	N/A	N/A	2 U	N/A	N/A
2,4-DICHLOROPHENOL	1 U	N/A	N/A	N/A	1 U	N/A	N/A
2,4-DIMETHYLPHENOL	1 UJ	N/A	N/A	N/A	1 UJ	N/A	N/A
2,4-DINITROPHENOL	5 UJ	N/A	N/A	N/A	5 UJ	N/A	N/A
2,4-DINITROTOLUENE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
2,6-DINITROTOLUENE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
2-CHLORONAPHTHALENE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
2-CHLOROPHENOL	1 U	N/A	N/A	N/A	1 U	N/A	N/A
2-METHYLNAPHTHALENE	1 UJ	N/A	N/A	N/A	1 UJ	N/A	N/A
2-METHYLPHENOL	1 U	N/A	N/A	N/A	1 U	N/A	N/A
2-NITROANILINE	2 U	N/A	N/A	N/A	2 U	N/A	N/A
2-NITROPHENOL	2 U	N/A	N/A	N/A	2 U	N/A	N/A
3,3'-DICHLOROBENZIDINE	1 UJ	N/A	N/A	N/A	1 UJ	N/A	N/A
3-NITROANILINE	2 U	N/A	N/A	N/A	2 UJ	N/A	N/A
4,6-DINITRO-2-METHYLPHENOL	2 UJ	N/A	N/A	N/A	2 UJ	N/A	N/A
4-BROMOPHENYL-PHENYLETHER	1 U	N/A	N/A	N/A	1 U	N/A	N/A
4-CHLORO-3-METHYLPHENOL	1 U	N/A	N/A	N/A	1 U	N/A	N/A
4-CHLOROANILINE	1 UJ	N/A	N/A	N/A	1 UJ	N/A	N/A
4-CHLOROPHENYL-PHENYLETHER	1 U	N/A	N/A	N/A	1 U	N/A	N/A
4-METHYLPHENOL	1 U	N/A	N/A	N/A	1 U	N/A	N/A
4-NITROANILINE	2 U	N/A	N/A	N/A	2 U	N/A	N/A
4-NITROPHENOL	5 U	N/A	N/A	N/A	5 U	N/A	N/A
ACENAPHTHENE	0.1 U	N/A	N/A	N/A	0.1 U	N/A	N/A
ACENAPHTHYLENE	0.1 U	N/A	N/A	N/A	0.1 U	N/A	N/A
ANTHRACENE	0.1 U	N/A	N/A	N/A	0.1 U	N/A	N/A
BENZO(A)ANTHRACENE	0.1 U	N/A	N/A	N/A	0.1 U	N/A	N/A
BENZO(A)PYRENE	0.1 U	N/A	N/A	N/A	0.1 U	N/A	N/A
BENZO(B)FLUORANTHENE	0.1 U	N/A	N/A	N/A	0.1 U	N/A	N/A
BENZO(G,H,I)PERYLENE	0.1 U	N/A	N/A	N/A	**0.09** J	N/A	N/A
BENZO(K)FLUORANTHENE	0.1 U	N/A	N/A	N/A	0.1 U	N/A	N/A
BIS(2-CHLOROETHOXY)METHANE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
BIS(2-CHLOROETHYL)ETHER	1 U	N/A	N/A	N/A	1 U	N/A	N/A
BIS(2-ETHYLHEXYL)PHTHALATE	1 UJ	N/A	N/A	N/A	1 UJ	N/A	N/A
BUTYLBENZYLPHTHALATE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
CARBAZOLE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
CHRYSENE	0.1 U	N/A	N/A	N/A	0.1 U	N/A	N/A

TABLE B-7 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL	SL	SL
Point Name:	SW11-61	SW11-62	SW11-63	SW11-63	SW11-63	SW11-64	SW11-64
Sample ID:	149-S11-105	149-S11-025	149-S11-026	149-S11-059	149-S11-106	149-S11-027	149-S11-060
Sample Date:	03-FEB-99	02-JUN-98	02-JUN-98	19-AUG-98	03-FEB-99	02-JUN-98	20-AUG-98
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL CREEK	MUDFLAT	MUDFLAT	MUDFLAT	MUDFLAT	MUDFLAT	MUDFLAT
SVOA (ug/L)							
2,4,5-TRICHLOROPHENOL	N/A	2 U	2 U	N/A	N/A	2 U	N/A
2,4,6-TRICHLOROPHENOL	N/A	2 U	2 U	N/A	N/A	2 U	N/A
2,4-DICHLOROPHENOL	N/A	1 U	1 U	N/A	N/A	1 U	N/A
2,4-DIMETHYLPHENOL	N/A	1 UJ	1 U	N/A	N/A	1 UJ	N/A
2,4-DINITROPHENOL	N/A	5 UJ	5 UJ	N/A	N/A	5 UJ	N/A
2,4-DINITROTOLUENE	N/A	1 U	1 U	N/A	N/A	1 U	N/A
2,6-DINITROTOLUENE	N/A	1 U	1 U	N/A	N/A	1 U	N/A
2-CHLORONAPHTHALENE	N/A	1 U	1 U	N/A	N/A	1 U	N/A
2-CHLOROPHENOL	N/A	1 U	1 U	N/A	N/A	1 U	N/A
2-METHYLNAPHTHALENE	N/A	1 UJ	1 U	N/A	N/A	1 UJ	N/A
2-METHYLPHENOL	N/A	1 U	1 U	N/A	N/A	1 U	N/A
2-NITROANILINE	N/A	2 U	2 U	N/A	N/A	2 U	N/A
2-NITROPHENOL	N/A	2 U	2 U	N/A	N/A	2 U	N/A
3,3'-DICHLOROBENZIDINE	N/A	1 UJ	2 U	N/A	N/A	1 UJ	N/A
3-NITROANILINE	N/A	2 U	2 U	N/A	N/A	2 U	N/A
4,6-DINITRO-2-METHYLPHENOL	N/A	2 UJ	2 UJ	N/A	N/A	2 UJ	N/A
4-BROMOPHENYL-PHENYLETHER	N/A	1 U	1 U	N/A	N/A	1 U	N/A
4-CHLORO-3-METHYLPHENOL	N/A	1 U	1 U	N/A	N/A	1 U	N/A
4-CHLOROANILINE	N/A	1 UJ	1 U	N/A	N/A	1 UJ	N/A
4-CHLOROPHENYL-PHENYLETHER	N/A	1 U	1 U	N/A	N/A	1 U	N/A
4-METHYLPHENOL	N/A	1 U	1 U	N/A	N/A	1 U	N/A
4-NITROANILINE	N/A	2 U	2 U	N/A	N/A	2 U	N/A
4-NITROPHENOL	N/A	5 U	5 U	N/A	N/A	5 U	N/A
ACENAPHTHENE	N/A	0.1 U	0.1 U	N/A	N/A	0.1 U	N/A
ACENAPHTHYLENE	N/A	0.1 U	0.1 U	N/A	N/A	0.1 U	N/A
ANTHRACENE	N/A	0.1 U	0.1 U	N/A	N/A	0.1 U	N/A
BENZO(A)ANTHRACENE	N/A	0.1 U	0.1 U	N/A	N/A	0.1 U	N/A
BENZO(A)PYRENE	N/A	0.1 U	0.1 U	N/A	N/A	0.1 U	N/A
BENZO(B)FLUORANTHENE	N/A	0.1 U	0.1 U	N/A	N/A	0.1 U	N/A
BENZO(G,H,I)PERYLENE	N/A	0.1 U	0.1 U	N/A	N/A	0.1 U	N/A
BENZO(K)FLUORANTHENE	N/A	0.1 U	0.1 U	N/A	N/A	0.1 U	N/A
BIS(2-CHLOROETHOXY)METHANE	N/A	1 U	1 U	N/A	N/A	1 U	N/A
BIS(2-CHLOROETHYL)ETHER	N/A	1 U	1 U	N/A	N/A	1 U	N/A
BIS(2-ETHYLHEXYL)PHTHALATE	N/A	1 U	1 UJ	N/A	N/A	1 UJ	N/A
BUTYLBENZYLPHTHALATE	N/A	1 U	1 U	N/A	N/A	1 U	N/A
CARBAZOLE	N/A	1 U	1 U	N/A	N/A	1 U	N/A
CHRYSENE	N/A	0.1 U	0.1 U	N/A	N/A	0.1 U	N/A

TABLE B-7 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL	SL	SL
Point Name:	SW11-64	SW11-64	SW11-66	SW11-66	SW11-66	SW11-66	SW11-67
Sample ID:	149-S11-083	149-S11-107	149-S11-029	149-S11-063	149-S11-084	149-S11-108	149-S11-030
Sample Date:	04-NOV-98	03-FEB-99	02-JUN-98	20-AUG-98	04-NOV-98	03-FEB-99	02-JUN-98
Screen Depth (feet bgs):							
ECO Habitat:	MUDFLAT	MUDFLAT	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL CREEK
SVOA (ug/L)							
2,4,5-TRICHLOROPHENOL	N/A	N/A	3 U	N/A	N/A	N/A	3 U
2,4,6-TRICHLOROPHENOL	N/A	N/A	2 U	N/A	N/A	N/A	2 U
2,4-DICHLOROPHENOL	N/A	N/A	1 U	N/A	N/A	N/A	1 U
2,4-DIMETHYLPHENOL	N/A	N/A	1 UJ	N/A	N/A	N/A	1 UJ
2,4-DINITROPHENOL	N/A	N/A	6 UJ	N/A	N/A	N/A	5 UJ
2,4-DINITROTOLUENE	N/A	N/A	1 U	N/A	N/A	N/A	1 U
2,6-DINITROTOLUENE	N/A	N/A	1 U	N/A	N/A	N/A	1 U
2-CHLORONAPHTHALENE	N/A	N/A	1 U	N/A	N/A	N/A	1 U
2-CHLOROPHENOL	N/A	N/A	1 U	N/A	N/A	N/A	1 U
2-METHYLNAPHTHALENE	N/A	N/A	1 UJ	N/A	N/A	N/A	1 UJ
2-METHYLPHENOL	N/A	N/A	1 U	N/A	N/A	N/A	1 U
2-NITROANILINE	N/A	N/A	3 U	N/A	N/A	N/A	3 U
2-NITROPHENOL	N/A	N/A	2 U	N/A	N/A	N/A	2 U
3,3'-DICHLOROBENZIDINE	N/A	N/A	1 UJ	N/A	N/A	N/A	1 UJ
3-NITROANILINE	N/A	N/A	3 UJ	N/A	N/A	N/A	3 UJ
4,6-DINITRO-2-METHYLPHENOL	N/A	N/A	3 UJ	N/A	N/A	N/A	3 UJ
4-BROMOPHENYL-PHENYLETHER	N/A	N/A	1 U	N/A	N/A	N/A	1 U
4-CHLORO-3-METHYLPHENOL	N/A	N/A	1 U	N/A	N/A	N/A	1 U
4-CHLOROANILINE	N/A	N/A	1 UJ	N/A	N/A	N/A	1 UJ
4-CHLOROPHENYL-PHENYLETHER	N/A	N/A	1 U	N/A	N/A	N/A	1 U
4-METHYLPHENOL	N/A	N/A	1 U	N/A	N/A	N/A	1 U
4-NITROANILINE	N/A	N/A	3 U	N/A	N/A	N/A	3 U
4-NITROPHENOL	N/A	N/A	5 U	N/A	N/A	N/A	5 U
ACENAPHTHENE	N/A	N/A	0.1 U	N/A	N/A	N/A	0.1 U
ACENAPHTHYLENE	N/A	N/A	0.1 U	N/A	N/A	N/A	0.1 U
ANTHRACENE	N/A	N/A	0.1 U	N/A	N/A	N/A	0.1 U
BENZO(A)ANTHRACENE	N/A	N/A	0.1 U	N/A	N/A	N/A	0.1 U
BENZO(A)PYRENE	N/A	N/A	0.1 U	N/A	N/A	N/A	0.1 U
BENZO(B)FLUORANTHENE	N/A	N/A	0.1 U	N/A	N/A	N/A	0.1 U
BENZO(G,H,I)PERYLENE	N/A	N/A	0.1 U	N/A	N/A	N/A	0.1 U
BENZO(K)FLUORANTHENE	N/A	N/A	0.1 U	N/A	N/A	N/A	0.1 U
BIS(2-CHLOROETHOXY)METHANE	N/A	N/A	1 U	N/A	N/A	N/A	1 U
BIS(2-CHLOROETHYL)ETHER	N/A	N/A	1 U	N/A	N/A	N/A	1 U
BIS(2-ETHYLHEXYL)PHTHALATE	N/A	N/A	1 UJ	N/A	N/A	N/A	1 UJ
BUTYLBENZYLPHTHALATE	N/A	N/A	1 U	N/A	N/A	N/A	1 U
CARBAZOLE	N/A	N/A	1 U	N/A	N/A	N/A	1 U
CHRYSENE	N/A	N/A	0.1 U	N/A	N/A	N/A	0.1 U

TABLE B-7 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL	SL	SL
Point Name:	SW11-67	SW11-67	SW11-67	SW11-68	SW11-68	SW11-68	SW11-68
Sample ID:	149-S11-064	149-S11-085	149-S11-109	149-S11-031	149-S11-065	149-S11-086	149-S11-110
Sample Date:	20-AUG-98	04-NOV-98	03-FEB-99	02-JUN-98	20-AUG-98	04-NOV-98	03-FEB-99
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK
SVOA (ug/L)							
2,4,5-TRICHLOROPHENOL	N/A	N/A	N/A	2 U	N/A	N/A	N/A
2,4,6-TRICHLOROPHENOL	N/A	N/A	N/A	2 U	N/A	N/A	N/A
2,4-DICHLOROPHENOL	N/A	N/A	N/A	1 U	N/A	N/A	N/A
2,4-DIMETHYLPHENOL	N/A	N/A	N/A	1 UJ	N/A	N/A	N/A
2,4-DINITROPHENOL	N/A	N/A	N/A	5 UJ	N/A	N/A	N/A
2,4-DINITROTOLUENE	N/A	N/A	N/A	1 U	N/A	N/A	N/A
2,6-DINITROTOLUENE	N/A	N/A	N/A	1 U	N/A	N/A	N/A
2-CHLORONAPHTHALENE	N/A	N/A	N/A	1 U	N/A	N/A	N/A
2-CHLOROPHENOL	N/A	N/A	N/A	1 U	N/A	N/A	N/A
2-METHYLNAPHTHALENE	N/A	N/A	N/A	1 UJ	N/A	N/A	N/A
2-METHYLPHENOL	N/A	N/A	N/A	1 U	N/A	N/A	N/A
2-NITROANILINE	N/A	N/A	N/A	2 U	N/A	N/A	N/A
2-NITROPHENOL	N/A	N/A	N/A	2 U	N/A	N/A	N/A
3,3'-DICHLOROBENZIDINE	N/A	N/A	N/A	1 UJ	N/A	N/A	N/A
3-NITROANILINE	N/A	N/A	N/A	2 UJ	N/A	N/A	N/A
4,6-DINITRO-2-METHYLPHENOL	N/A	N/A	N/A	2 UJ	N/A	N/A	N/A
4-BROMOPHENYL-PHENYLETHER	N/A	N/A	N/A	1 U	N/A	N/A	N/A
4-CHLORO-3-METHYLPHENOL	N/A	N/A	N/A	1 U	N/A	N/A	N/A
4-CHLOROANILINE	N/A	N/A	N/A	1 UJ	N/A	N/A	N/A
4-CHLOROPHENYL-PHENYLETHER	N/A	N/A	N/A	1 U	N/A	N/A	N/A
4-METHYLPHENOL	N/A	N/A	N/A	1 U	N/A	N/A	N/A
4-NITROANILINE	N/A	N/A	N/A	2 U	N/A	N/A	N/A
4-NITROPHENOL	N/A	N/A	N/A	5 U	N/A	N/A	N/A
ACENAPHTHENE	N/A	N/A	N/A	0.1 U	N/A	N/A	N/A
ACENAPHTHYLENE	N/A	N/A	N/A	0.1 U	N/A	N/A	N/A
ANTHRACENE	N/A	N/A	N/A	0.1 U	N/A	N/A	N/A
BENZO(A)ANTHRACENE	N/A	N/A	N/A	0.1 U	N/A	N/A	N/A
BENZO(A)PYRENE	N/A	N/A	N/A	0.1 U	N/A	N/A	N/A
BENZO(B)FLUORANTHENE	N/A	N/A	N/A	0.1 U	N/A	N/A	N/A
BENZO(G,H,I)PERYLENE	N/A	N/A	N/A	0.1 U	N/A	N/A	N/A
BENZO(K)FLUORANTHENE	N/A	N/A	N/A	0.1 U	N/A	N/A	N/A
BIS(2-CHLOROETHOXY)METHANE	N/A	N/A	N/A	1 U	N/A	N/A	N/A
BIS(2-CHLOROETHYL)ETHER	N/A	N/A	N/A	1 U	N/A	N/A	N/A
BIS(2-ETHYLHEXYL)PHTHALATE	N/A	N/A	N/A	1 UJ	N/A	N/A	N/A
BUTYLBENZYLPHTHALATE	N/A	N/A	N/A	1 U	N/A	N/A	N/A
CARBAZOLE	N/A	N/A	N/A	1 U	N/A	N/A	N/A
CHRYSENE	N/A	N/A	N/A	0.1 U	N/A	N/A	N/A

TABLE B-7 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL	SL	SL
Point Name:	SW11-69	SW11-69	SW11-69	SW11-69	SW11-70	SW11-70	SW11-70
Sample ID:	149-S11-032	149-S11-066	149-S11-087	149-S11-111	149-S11-033	149-S11-067	149-S11-088
Sample Date:	02-JUN-98	20-AUG-98	04-NOV-98	03-FEB-99	02-JUN-98	19-AUG-98	04-NOV-98
Screen Depth (feet bgs):							
ECO Habitat:	MUDFLAT	MUDFLAT	MUDFLAT	MUDFLAT	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
SVOA (ug/L)							
2,4,5-TRICHLOROPHENOL	2 U	N/A	N/A	N/A	3 U	N/A	N/A
2,4,6-TRICHLOROPHENOL	2 U	N/A	N/A	N/A	2 U	N/A	N/A
2,4-DICHLOROPHENOL	1 U	N/A	N/A	N/A	1 U	N/A	N/A
2,4-DIMETHYLPHENOL	1 UJ	N/A	N/A	N/A	1 UJ	N/A	N/A
2,4-DINITROPHENOL	5 UJ	N/A	N/A	N/A	5 UJ	N/A	N/A
2,4-DINITROTOLUENE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
2,6-DINITROTOLUENE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
2-CHLORONAPHTHALENE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
2-CHLOROPHENOL	1 U	N/A	N/A	N/A	1 U	N/A	N/A
2-METHYLNAPHTHALENE	1 UJ	N/A	N/A	N/A	1 UJ	N/A	N/A
2-METHYLPHENOL	1 U	N/A	N/A	N/A	1 U	N/A	N/A
2-NITROANILINE	2 U	N/A	N/A	N/A	3 U	N/A	N/A
2-NITROPHENOL	2 U	N/A	N/A	N/A	2 U	N/A	N/A
3,3'-DICHLOROBENZIDINE	1 UJ	N/A	N/A	N/A	1 UJ	N/A	N/A
3-NITROANILINE	2 UJ	N/A	N/A	N/A	3 U	N/A	N/A
4,6-DINITRO-2-METHYLPHENOL	2 UJ	N/A	N/A	N/A	3 UJ	N/A	N/A
4-BROMOPHENYL-PHENYLETHER	1 U	N/A	N/A	N/A	1 U	N/A	N/A
4-CHLORO-3-METHYLPHENOL	1 U	N/A	N/A	N/A	1 U	N/A	N/A
4-CHLOROANILINE	1 UJ	N/A	N/A	N/A	1 UJ	N/A	N/A
4-CHLOROPHENYL-PHENYLETHER	1 U	N/A	N/A	N/A	1 U	N/A	N/A
4-METHYLPHENOL	1 U	N/A	N/A	N/A	1 U	N/A	N/A
4-NITROANILINE	2 U	N/A	N/A	N/A	3 U	N/A	N/A
4-NITROPHENOL	5 U	N/A	N/A	N/A	5 U	N/A	N/A
ACENAPHTHENE	0.1 U	N/A	N/A	N/A	0.1 U	N/A	N/A
ACENAPHTHYLENE	0.1 U	N/A	N/A	N/A	0.1 U	N/A	N/A
ANTHRACENE	0.1 U	N/A	N/A	N/A	0.1 U	N/A	N/A
BENZO(A)ANTHRACENE	0.1 U	N/A	N/A	N/A	0.1 U	N/A	N/A
BENZO(A)PYRENE	0.1 U	N/A	N/A	N/A	0.1 U	N/A	N/A
BENZO(B)FLUORANTHENE	0.1 U	N/A	N/A	N/A	0.1 U	N/A	N/A
BENZO(G,H,I)PERYLENE	0.1 U	N/A	N/A	N/A	0.1 U	N/A	N/A
BENZO(K)FLUORANTHENE	0.1 U	N/A	N/A	N/A	0.1 U	N/A	N/A
BIS(2-CHLOROETHOXY)METHANE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
BIS(2-CHLOROETHYL)ETHER	1 U	N/A	N/A	N/A	1 U	N/A	N/A
BIS(2-ETHYLHEXYL)PHTHALATE	1 UJ	N/A	N/A	N/A	1 U	N/A	N/A
BUTYLBENZYLPHTHALATE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
CARBAZOLE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
CHRYSENE	0.1 U	N/A	N/A	N/A	0.1 U	N/A	N/A

TABLE B-7 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL
Point Name:	SW11-70	SW11-75	SW11-75	SW11-75	SW11-75
Sample ID:	149-S11-112	149-S11-039	149-S11-073	149-S11-094	149-S11-118
Sample Date:	03-FEB-99	03-JUN-98	19-AUG-98	06-NOV-98	03-FEB-99
Screen Depth (feet bgs):					
ECO Habitat:	TIDAL MARSH	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK
SVOA (ug/L)					
2,4,5-TRICHLOROPHENOL	N/A	3 U	N/A	N/A	N/A
2,4,6-TRICHLOROPHENOL	N/A	2 U	N/A	N/A	N/A
2,4-DICHLOROPHENOL	N/A	1 U	N/A	N/A	N/A
2,4-DIMETHYLPHENOL	N/A	1 U	N/A	N/A	N/A
2,4-DINITROPHENOL	N/A	5 U	N/A	N/A	N/A
2,4-DINITROTOLUENE	N/A	1 U	N/A	N/A	N/A
2,6-DINITROTOLUENE	N/A	1 U	N/A	N/A	N/A
2-CHLORONAPHTHALENE	N/A	1 U	N/A	N/A	N/A
2-CHLOROPHENOL	N/A	1 U	N/A	N/A	N/A
2-METHYLNAPHTHALENE	N/A	1 U	N/A	N/A	N/A
2-METHYLPHENOL	N/A	1 U	N/A	N/A	N/A
2-NITROANILINE	N/A	3 U	N/A	N/A	N/A
2-NITROPHENOL	N/A	2 U	N/A	N/A	N/A
3,3'-DICHLOROBENZIDINE	N/A	2 U	N/A	N/A	N/A
3-NITROANILINE	N/A	3 U	N/A	N/A	N/A
4,6-DINITRO-2-METHYLPHENOL	N/A	3 U	N/A	N/A	N/A
4-BROMOPHENYL-PHENYLETHER	N/A	1 U	N/A	N/A	N/A
4-CHLORO-3-METHYLPHENOL	N/A	1 U	N/A	N/A	N/A
4-CHLOROANILINE	N/A	1 U	N/A	N/A	N/A
4-CHLOROPHENYL-PHENYLETHER	N/A	1 U	N/A	N/A	N/A
4-METHYLPHENOL	N/A	1 U	N/A	N/A	N/A
4-NITROANILINE	N/A	3 U	N/A	N/A	N/A
4-NITROPHENOL	N/A	5 U	N/A	N/A	N/A
ACENAPHTHENE	N/A	0.1 U	N/A	N/A	N/A
ACENAPHTHYLENE	N/A	0.1 U	N/A	N/A	N/A
ANTHRACENE	N/A	0.1 U	N/A	N/A	N/A
BENZO(A)ANTHRACENE	N/A	0.1 U	N/A	N/A	N/A
BENZO(A)PYRENE	N/A	0.1 U	N/A	N/A	N/A
BENZO(B)FLUORANTHENE	N/A	0.1 U	N/A	N/A	N/A
BENZO(G,H,I)PERYLENE	N/A	0.1 U	N/A	N/A	N/A
BENZO(K)FLUORANTHENE	N/A	0.1 U	N/A	N/A	N/A
BIS(2-CHLOROETHOXY)METHANE	N/A	1 U	N/A	N/A	N/A
BIS(2-CHLOROETHYL)ETHER	N/A	1 U	N/A	N/A	N/A
BIS(2-ETHYLHEXYL)PHTHALATE	N/A	1 U	N/A	N/A	N/A
BUTYLBENZYLPHTHALATE	N/A	1 U	N/A	N/A	N/A
CARBAZOLE	N/A	1 U	N/A	N/A	N/A
CHRYSENE	N/A	0.1 U	N/A	N/A	N/A

TABLE B-7 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL	SL	SL
Point Name:	SW11-60	SW11-60	SW11-60	SW11-60	SW11-61	SW11-61	SW11-61
Sample ID:	149-S11-022	149-S11-056	149-S11-080	149-S11-104	149-S11-023	149-S11-057	149-S11-081
Sample Date:	02-JUN-98	20-AUG-98	04-NOV-98	03-FEB-99	02-JUN-98	20-AUG-98	04-NOV-98
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK
SVOA (ug/L)							
DI-N-BUTYLPHTHALATE	1 UJ	N/A	N/A	N/A	6 U	N/A	N/A
DI-N-OCTYLPHTHALATE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
DIBENZO(A,H)ANTHRACENE	0.1 U	N/A	N/A	N/A	0.1 U	N/A	N/A
DIBENZOFURAN	1 U	N/A	N/A	N/A	1 U	N/A	N/A
DIETHYLPHTHALATE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
DIMETHYLPHTHALATE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
FLUORANTHENE	0.1 U	N/A	N/A	N/A	0.1 U	N/A	N/A
FLUORENE	0.1 U	N/A	N/A	N/A	0.1 U	N/A	N/A
HEXACHLOROBENZENE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
HEXACHLOROBUTADIENE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
HEXACHLOROCYCLOPENTADIENE	1 UJ	N/A	N/A	N/A	1 UJ	N/A	N/A
HEXACHLOROETHANE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
INDENO(1,2,3-CD)PYRENE	0.1 U	N/A	N/A	N/A	**0.04** J	N/A	N/A
ISOPHORONE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
N-NITROSO-DI-N-PROPYLAMINE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
N-NITROSODIPHENYLAMINE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
NAPHTHALENE	0.1 U	N/A	N/A	N/A	0.1 U	N/A	N/A
NITROBENZENE	1 U	N/A	N/A	N/A	1 UJ	N/A	N/A
PENTACHLOROPHENOL	5 U	N/A	N/A	N/A	5 U	N/A	N/A
PHENANTHRENE	0.1 U	N/A	N/A	N/A	0.1 U	N/A	N/A
PHENOL	1 U	N/A	N/A	N/A	1 U	N/A	N/A
PYRENE	0.1 U	N/A	N/A	N/A	0.1 U	N/A	N/A
VOA (ug/L)							
1,1,1-TRICHLOROETHANE	2 U	2 UJ	2 U	10 U	2 U	2 UJ	2 U
1,1,2,2-TETRACHLOROETHANE	2 UJ	2 UJ	2 U	10 U	2 UJ	2 UJ	2 U
1,1,2-TRICHLOROETHANE	2 U	2 UJ	2 U	10 U	2 U	2 UJ	2 U
1,1-DICHLOROETHANE	2 U	2 UJ	2 U	10 U	2 U	2 UJ	2 U
1,1-DICHLOROETHENE	2 U	2 UJ	2 UJ	10 U	2 U	2 UJ	2 UJ
1,2-DICHLOROETHANE	0.5 U	0.5 UJ	0.5 U	3 U	0.5 U	0.5 UJ	0.5 U
1,2-DICHLOROETHENE (TOTAL)	N/A	N/A	2 UJ	10 U	N/A	N/A	2 UJ
1,2-DICHLOROPROPANE	2 U	2 UJ	2 U	10 U	2 U	2 UJ	2 U
2-BUTANONE	2 U	**0.2** J	2 UJ	10 U	2 U	2 UJ	2 UJ
2-HEXANONE	2 U	2 UJ	2 UJ	10 U	2 U	2 UJ	2 UJ
4-METHYL-2-PENTANONE	2 U	2 UJ	2 U	10 U	2 U	2 UJ	2 U
ACETONE	2 U	3 UJ	2 UJ	14 UJ	2 U	2 UJ	2 UJ
BENZENE	2 U	2 UJ	2 U	3 U	2 U	2 UJ	2 U
BROMODICHLOROMETHANE	2 U	2 UJ	2 U	10 U	2 U	2 UJ	2 U

TABLE B-7 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL	SL	SL
Point Name:	SW11-61	SW11-62	SW11-63	SW11-63	SW11-63	SW11-64	SW11-64
Sample ID:	149-S11-105	149-S11-025	149-S11-026	149-S11-059	149-S11-106	149-S11-027	149-S11-060
Sample Date:	03-FEB-99	02-JUN-98	02-JUN-98	19-AUG-98	03-FEB-99	02-JUN-98	20-AUG-98
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL CREEK	MUDFLAT	MUDFLAT	MUDFLAT	MUDFLAT	MUDFLAT	MUDFLAT
SVOA (ug/L)							
DI-N-BUTYLPHTHALATE	N/A	6 U	6 U	N/A	N/A	6 U	N/A
DI-N-OCTYLPHTHALATE	N/A	1 U	1 U	N/A	N/A	1 U	N/A
DIBENZO(A,H)ANTHRACENE	N/A	0.1 U	0.1 U	N/A	N/A	0.1 U	N/A
DIBENZOFURAN	N/A	1 U	1 U	N/A	N/A	1 U	N/A
DIETHYLPHTHALATE	N/A	1 U	1 U	N/A	N/A	1 U	N/A
DIMETHYLPHTHALATE	N/A	1 U	1 U	N/A	N/A	1 U	N/A
FLUORANTHENE	N/A	0.1 U	0.1 U	N/A	N/A	0.1 U	N/A
FLUORENE	N/A	0.1 U	0.1 U	N/A	N/A	0.1 U	N/A
HEXACHLOROBENZENE	N/A	1 U	1 U	N/A	N/A	1 U	N/A
HEXACHLOROBUTADIENE	N/A	1 U	1 U	N/A	N/A	1 U	N/A
HEXACHLOROCYCLOPENTADIENE	N/A	1 UJ	1 UJ	N/A	N/A	1 UJ	N/A
HEXACHLOROETHANE	N/A	1 U	1 U	N/A	N/A	1 U	N/A
INDENO(1,2,3-CD)PYRENE	N/A	0.1 U	0.1 U	N/A	N/A	0.1 U	N/A
ISOPHORONE	N/A	1 U	1 U	N/A	N/A	1 U	N/A
N-NITROSO-DI-N-PROPYLAMINE	N/A	1 U	1 U	N/A	N/A	1 U	N/A
N-NITROSODIPHENYLAMINE	N/A	1 U	1 U	N/A	N/A	1 U	N/A
NAPHTHALENE	N/A	0.1 U	0.1 U	N/A	N/A	0.1 U	N/A
NITROBENZENE	N/A	1 U	1 U	N/A	N/A	1 U	N/A
PENTACHLOROPHENOL	N/A	5 U	5 U	N/A	N/A	5 U	N/A
PHENANTHRENE	N/A	0.1 U	0.1 U	N/A	N/A	0.1 U	N/A
PHENOL	N/A	1 U	1 U	N/A	N/A	1 U	N/A
PYRENE	N/A	0.1 U	0.1 U	N/A	N/A	0.1 U	N/A
VOA (ug/L)							
1,1,1-TRICHLOROETHANE	10 U	2 U	2 U	2 U	10 U	2 U	2 UJ
1,1,2,2-TETRACHLOROETHANE	10 U	2 UJ	2 UJ	2 UJ	10 U	2 UJ	2 UJ
1,1,2-TRICHLOROETHANE	10 U	2 U	2 U	2 U	10 U	2 U	2 UJ
1,1-DICHLOROETHANE	10 U	2 U	2 U	2 U	10 U	2 U	2 UJ
1,1-DICHLOROETHENE	10 U	2 U	2 U	2 U	10 U	2 U	2 UJ
1,2-DICHLOROETHANE	3 U	0.5 U	0.5 U	0.5 U	3 U	0.5 U	0.5 UJ
1,2-DICHLOROETHENE (TOTAL)	10 U	N/A	N/A	N/A	10 U	N/A	N/A
1,2-DICHLOROPROPANE	10 U	2 U	2 U	2 U	10 U	2 U	2 UJ
2-BUTANONE	10 U	2 U	2 U	2 U	10 U	2 U	2 UJ
2-HEXANONE	10 U	2 U	2 U	2 UJ	10 U	2 U	2 UJ
4-METHYL-2-PENTANONE	10 U	2 U	2 U	2 U	10 U	2 U	2 UJ
ACETONE	14 UJ	2 U	2 U	2 UJ	10 UJ	2 U	2 UJ
BENZENE	3 U	2 U	2 U	2 U	3 U	2 U	2 UJ
BROMODICHLOROMETHANE	10 U	2 U	2 U	2 U	10 U	2 U	2 UJ

TABLE B-7 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL	SL	SL
Point Name:	SW11-64	SW11-64	SW11-66	SW11-66	SW11-66	SW11-66	SW11-67
Sample ID:	149-S11-083	149-S11-107	149-S11-029	149-S11-063	149-S11-084	149-S11-108	149-S11-030
Sample Date:	04-NOV-98	03-FEB-99	02-JUN-98	20-AUG-98	04-NOV-98	03-FEB-99	02-JUN-98
Screen Depth (feet bgs):							
ECO Habitat:	MUDFLAT	MUDFLAT	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL CREEK
SVOA (ug/L)							
DI-N-BUTYLPHTHALATE	N/A	N/A	6 U	N/A	N/A	N/A	1 UJ
DI-N-OCTYLPHTHALATE	N/A	N/A	1 U	N/A	N/A	N/A	1 U
DIBENZO(A,H)ANTHRACENE	N/A	N/A	0.1 U	N/A	N/A	N/A	0.1 U
DIBENZOFURAN	N/A	N/A	1 U	N/A	N/A	N/A	1 U
DIETHYLPHTHALATE	N/A	N/A	1 U	N/A	N/A	N/A	1 U
DIMETHYLPHTHALATE	N/A	N/A	1 U	N/A	N/A	N/A	1 U
FLUORANTHENE	N/A	N/A	0.1 U	N/A	N/A	N/A	0.1 U
FLUORENE	N/A	N/A	0.1 U	N/A	N/A	N/A	0.1 U
HEXACHLOROBENZENE	N/A	N/A	1 U	N/A	N/A	N/A	1 U
HEXACHLOROBUTADIENE	N/A	N/A	1 U	N/A	N/A	N/A	1 U
HEXACHLOROCYCLOPENTADIENE	N/A	N/A	1 UJ	N/A	N/A	N/A	1 UJ
HEXACHLOROETHANE	N/A	N/A	1 U	N/A	N/A	N/A	1 U
INDENO(1,2,3-CD)PYRENE	N/A	N/A	0.1 U	N/A	N/A	N/A	0.1 U
ISOPHORONE	N/A	N/A	1 U	N/A	N/A	N/A	1 U
N-NITROSO-DI-N-PROPYLAMINE	N/A	N/A	1 U	N/A	N/A	N/A	1 U
N-NITROSODIPHENYLAMINE	N/A	N/A	1 U	N/A	N/A	N/A	1 U
NAPHTHALENE	N/A	N/A	0.1 U	N/A	N/A	N/A	0.1 U
NITROBENZENE	N/A	N/A	1 UJ	N/A	N/A	N/A	1 UJ
PENTACHLOROPHENOL	N/A	N/A	5 U	N/A	N/A	N/A	5 U
PHENANTHRENE	N/A	N/A	0.1 U	N/A	N/A	N/A	0.1 U
PHENOL	N/A	N/A	1 U	N/A	N/A	N/A	1 U
PYRENE	N/A	N/A	0.1 U	N/A	N/A	N/A	0.1 U
VOA (ug/L)							
1,1,1-TRICHLOROETHANE	2 U	10 U	2 U	2 UJ	2 U	10 U	2 U
1,1,2,2-TETRACHLOROETHANE	2 U	10 U	2 UJ	2 UJ	2 U	10 U	2 UJ
1,1,2-TRICHLOROETHANE	2 U	10 U	2 U	2 UJ	2 U	10 U	2 U
1,1-DICHLOROETHANE	2 U	10 U	2 U	2 UJ	2 U	10 U	2 U
1,1-DICHLOROETHENE	2 UJ	10 U	2 U	2 UJ	2 UJ	10 U	2 U
1,2-DICHLOROETHANE	0.5 U	3 U	0.5 U	0.5 UJ	0.5 U	3 U	0.5 U
1,2-DICHLOROETHENE (TOTAL)	2 UJ	10 U	N/A	N/A	2 UJ	10 U	N/A
1,2-DICHLOROPROPANE	2 U	10 U	2 U	2 UJ	2 U	10 U	2 U
2-BUTANONE	2 UJ	10 U	2 U	2 UJ	2 UJ	10 U	2 U
2-HEXANONE	2 UJ	10 U	2 U	2 UJ	2 UJ	10 U	2 U
4-METHYL-2-PENTANONE	2 U	10 U	2 U	2 UJ	2 U	10 U	2 U
ACETONE	2 UJ	11 UJ	2 U	2 UJ	2 UJ	16 UJ	2 U
BENZENE	2 U	3 U	2 U	2 UJ	2 U	3 U	2 U
BROMODICHLOROMETHANE	2 U	10 U	2 U	2 UJ	2 U	10 U	2 U

TABLE B-7 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL	SL	SL
Point Name:	SW11-67	SW11-67	SW11-67	SW11-68	SW11-68	SW11-68	SW11-68
Sample ID:	149-S11-064	149-S11-085	149-S11-109	149-S11-031	149-S11-065	149-S11-086	149-S11-110
Sample Date:	20-AUG-98	04-NOV-98	03-FEB-99	02-JUN-98	20-AUG-98	04-NOV-98	03-FEB-99
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK
SVOA (ug/L)							
DI-N-BUTYLPHTHALATE	N/A	N/A	N/A	1 UJ	N/A	N/A	N/A
DI-N-OCTYLPHTHALATE	N/A	N/A	N/A	1 U	N/A	N/A	N/A
DIBENZO(A,H)ANTHRACENE	N/A	N/A	N/A	0.1 U	N/A	N/A	N/A
DIBENZOFURAN	N/A	N/A	N/A	1 U	N/A	N/A	N/A
DIETHYLPHTHALATE	N/A	N/A	N/A	1 U	N/A	N/A	N/A
DIMETHYLPHTHALATE	N/A	N/A	N/A	1 U	N/A	N/A	N/A
FLUORANTHENE	N/A	N/A	N/A	0.1 U	N/A	N/A	N/A
FLUORENE	N/A	N/A	N/A	0.1 U	N/A	N/A	N/A
HEXACHLOROBENZENE	N/A	N/A	N/A	1 U	N/A	N/A	N/A
HEXACHLOROBUTADIENE	N/A	N/A	N/A	1 U	N/A	N/A	N/A
HEXACHLOROCYCLOPENTADIENE	N/A	N/A	N/A	1 UJ	N/A	N/A	N/A
HEXACHLOROETHANE	N/A	N/A	N/A	1 U	N/A	N/A	N/A
INDENO(1,2,3-CD)PYRENE	N/A	N/A	N/A	0.1 U	N/A	N/A	N/A
ISOPHORONE	N/A	N/A	N/A	1 U	N/A	N/A	N/A
N-NITROSO-DI-N-PROPYLAMINE	N/A	N/A	N/A	1 U	N/A	N/A	N/A
N-NITROSODIPHENYLAMINE	N/A	N/A	N/A	1 U	N/A	N/A	N/A
NAPHTHALENE	N/A	N/A	N/A	0.1 U	N/A	N/A	N/A
NITROBENZENE	N/A	N/A	N/A	1 UJ	N/A	N/A	N/A
PENTACHLOROPHENOL	N/A	N/A	N/A	5 U	N/A	N/A	N/A
PHENANTHRENE	N/A	N/A	N/A	0.1 U	N/A	N/A	N/A
PHENOL	N/A	N/A	N/A	1 U	N/A	N/A	N/A
PYRENE	N/A	N/A	N/A	0.1 U	N/A	N/A	N/A
VOA (ug/L)							
1,1,1-TRICHLOROETHANE	2 UJ	2 U	10 U	**0.3** J	2 UJ	2 U	10 U
1,1,2,2-TETRACHLOROETHANE	2 UJ	2 U	10 U	2 UJ	2 UJ	2 U	10 U
1,1,2-TRICHLOROETHANE	2 UJ	2 U	10 U	2 U	2 UJ	2 U	10 U
1,1-DICHLOROETHANE	2 UJ	2 U	10 U	**0.5** J	2 UJ	2 U	10 U
1,1-DICHLOROETHENE	2 UJ	2 UJ	10 U	2 U	2 UJ	2 UJ	10 U
1,2-DICHLOROETHANE	0.5 UJ	0.5 U	3 U	0.5 U	0.5 UJ	0.5 U	3 U
1,2-DICHLOROETHENE (TOTAL)	N/A	2 UJ	10 U	N/A	N/A	2 UJ	10 U
1,2-DICHLOROPROPANE	2 UJ	2 U	10 U	2 U	2 UJ	2 U	10 U
2-BUTANONE	2 UJ	2 UJ	10 UJ	2 U	2 UJ	2 UJ	10 U
2-HEXANONE	2 UJ	2 UJ	10 U	2 U	2 UJ	2 UJ	10 U
4-METHYL-2-PENTANONE	2 UJ	2 U	10 U	2 U	2 UJ	2 U	10 U
ACETONE	2 UJ	2 UJ	15 UJ	2 U	2 UJ	2 UJ	12 UJ
BENZENE	2 UJ	2 U	3 U	2 U	2 UJ	2 U	3 U
BROMODICHLOROMETHANE	2 UJ	2 U	10 U	2 U	2 UJ	2 U	10 U

TABLE B-7 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL	SL	SL
Point Name:	SW11-69	SW11-69	SW11-69	SW11-69	SW11-70	SW11-70	SW11-70
Sample ID:	149-S11-032	149-S11-066	149-S11-087	149-S11-111	149-S11-033	149-S11-067	149-S11-088
Sample Date:	02-JUN-98	20-AUG-98	04-NOV-98	03-FEB-99	02-JUN-98	19-AUG-98	04-NOV-98
Screen Depth (feet bgs):							
ECO Habitat:	MUDFLAT	MUDFLAT	MUDFLAT	MUDFLAT	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
SVOA (ug/L)							
DI-N-BUTYLPHTHALATE	6 U	N/A	N/A	N/A	6 U	N/A	N/A
DI-N-OCTYLPHTHALATE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
DIBENZO(A,H)ANTHRACENE	0.1 U	N/A	N/A	N/A	0.1 U	N/A	N/A
DIBENZOFURAN	1 U	N/A	N/A	N/A	1 U	N/A	N/A
DIETHYLPHTHALATE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
DIMETHYLPHTHALATE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
FLUORANTHENE	0.1 U	N/A	N/A	N/A	0.1 U	N/A	N/A
FLUORENE	0.1 U	N/A	N/A	N/A	0.1 U	N/A	N/A
HEXACHLOROBENZENE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
HEXACHLOROBUTADIENE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
HEXACHLOROCYCLOPENTADIENE	1 UJ	N/A	N/A	N/A	1 UJ	N/A	N/A
HEXACHLOROETHANE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
INDENO(1,2,3-CD)PYRENE	0.1 U	N/A	N/A	N/A	0.1 U	N/A	N/A
ISOPHORONE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
N-NITROSO-DI-N-PROPYLAMINE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
N-NITROSODIPHENYLAMINE	1 U	N/A	N/A	N/A	1 U	N/A	N/A
NAPHTHALENE	0.1 U	N/A	N/A	N/A	0.1 U	N/A	N/A
NITROBENZENE	1 UJ	N/A	N/A	N/A	1 U	N/A	N/A
PENTACHLOROPHENOL	5 U	N/A	N/A	N/A	5 U	N/A	N/A
PHENANTHRENE	0.1 U	N/A	N/A	N/A	0.1 U	N/A	N/A
PHENOL	1 U	N/A	N/A	N/A	1 U	N/A	N/A
PYRENE	0.1 U	N/A	N/A	N/A	0.1 U	N/A	N/A
VOA (ug/L)							
1,1,1-TRICHLOROETHANE	2 U	2 UJ	2 U	10 U	2 U	2 U	2 U
1,1,2,2-TETRACHLOROETHANE	2 UJ	2 UJ	2 U	10 U	2 UJ	2 UJ	2 U
1,1,2-TRICHLOROETHANE	2 U	2 UJ	2 U	10 U	2 U	2 U	2 U
1,1-DICHLOROETHANE	2 U	**0.2** J	2 U	10 U	2 U	2 U	2 U
1,1-DICHLOROETHENE	2 U	2 UJ	2 UJ	10 U	2 U	2 U	2 U
1,2-DICHLOROETHANE	0.5 U	0.5 UJ	0.5 U	3 U	0.5 U	0.5 U	0.5 U
1,2-DICHLOROETHENE (TOTAL)	N/A	N/A	2 UJ	10 U	N/A	N/A	2 U
1,2-DICHLOROPROPANE	2 U	2 UJ	2 U	10 U	2 U	2 U	2 U
2-BUTANONE	2 U	2 UJ	2 UJ	10 U	2 U	2 U	2 U
2-HEXANONE	2 U	2 UJ	2 UJ	10 U	2 U	2 UJ	2 UJ
4-METHYL-2-PENTANONE	2 U	2 UJ	2 U	10 U	2 U	2 U	2 U
ACETONE	2 U	2 UJ	2 UJ	17 UJ	2 U	2 UJ	2 UJ
BENZENE	2 U	2 UJ	2 U	3 U	2 U	2 U	2 U
BROMODICHLOROMETHANE	2 U	2 UJ	2 U	10 U	2 U	2 U	2 U

TABLE B-7 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL
Point Name:	SW11-70	SW11-75	SW11-75	SW11-75	SW11-75
Sample ID:	149-S11-112	149-S11-039	149-S11-073	149-S11-094	149-S11-118
Sample Date:	03-FEB-99	03-JUN-98	19-AUG-98	06-NOV-98	03-FEB-99
Screen Depth (feet bgs):					
ECO Habitat:	TIDAL MARSH	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK
SVOA (ug/L)					
DI-N-BUTYLPHTHALATE	N/A	6 U	N/A	N/A	N/A
DI-N-OCTYLPHTHALATE	N/A	1 U	N/A	N/A	N/A
DIBENZO(A,H)ANTHRACENE	N/A	0.1 U	N/A	N/A	N/A
DIBENZOFURAN	N/A	1 U	N/A	N/A	N/A
DIETHYLPHTHALATE	N/A	1 UJ	N/A	N/A	N/A
DIMETHYLPHTHALATE	N/A	1 U	N/A	N/A	N/A
FLUORANTHENE	N/A	0.1 U	N/A	N/A	N/A
FLUORENE	N/A	0.1 U	N/A	N/A	N/A
HEXACHLOROBENZENE	N/A	1 U	N/A	N/A	N/A
HEXACHLOROBUTADIENE	N/A	1 U	N/A	N/A	N/A
HEXACHLOROCYCLOPENTADIENE	N/A	1 U	N/A	N/A	N/A
HEXACHLOROETHANE	N/A	1 U	N/A	N/A	N/A
INDENO(1,2,3-CD)PYRENE	N/A	0.1 U	N/A	N/A	N/A
ISOPHORONE	N/A	1 U	N/A	N/A	N/A
N-NITROSO-DI-N-PROPYLAMINE	N/A	1 U	N/A	N/A	N/A
N-NITROSODIPHENYLAMINE	N/A	1 U	N/A	N/A	N/A
NAPHTHALENE	N/A	0.1 U	N/A	N/A	N/A
NITROBENZENE	N/A	1 U	N/A	N/A	N/A
PENTACHLOROPHENOL	N/A	5 U	N/A	N/A	N/A
PHENANTHRENE	N/A	0.1 U	N/A	N/A	N/A
PHENOL	N/A	1 U	N/A	N/A	N/A
PYRENE	N/A	0.1 U	N/A	N/A	N/A
VOA (ug/L)					
1,1,1-TRICHLOROETHANE	2 U	**0.2** J	2 U	2 U	2 U
1,1,2,2-TETRACHLOROETHANE	2 U	2 UJ	2 UJ	2 U	2 U
1,1,2-TRICHLOROETHANE	2 U	2 U	2 U	2 U	2 U
1,1-DICHLOROETHANE	2 U	2 U	2 U	2 U	2 U
1,1-DICHLOROETHENE	2 U	2 U	2 U	2 U	2 U
1,2-DICHLOROETHANE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DICHLOROETHENE (TOTAL)	2 U	N/A	N/A	2 UJ	2 U
1,2-DICHLOROPROPANE	2 U	2 U	2 U	2 U	2 U
2-BUTANONE	2 UJ	2 U	2 U	2 U	2 U
2-HEXANONE	2 U	2 U	2 UJ	2 UJ	2 U
4-METHYL-2-PENTANONE	2 U	2 U	2 U	2 U	2 U
ACETONE	4 UJ	2 U	2 UJ	3 UJ	3 UJ
BENZENE	0.5 U	2 U	2 U	2 U	0.5 U
BROMODICHLOROMETHANE	2 U	2 U	2 U	2 U	2 U

TABLE B-7 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL	SL	SL
Point Name:	SW11-60	SW11-60	SW11-60	SW11-60	SW11-61	SW11-61	SW11-61
Sample ID:	149-S11-022	149-S11-056	149-S11-080	149-S11-104	149-S11-023	149-S11-057	149-S11-081
Sample Date:	02-JUN-98	20-AUG-98	04-NOV-98	03-FEB-99	02-JUN-98	20-AUG-98	04-NOV-98
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK
VOA (ug/L)							
BROMOFORM	2 U	2 UJ	2 U	10 U	2 U	2 UJ	2 U
BROMOMETHANE	2 U	2 UJ	2 U	10 U	2 U	2 UJ	2 U
CARBON DISULFIDE	2 U	2 UJ	2 UJ	10 U	2 U	2 UJ	2 UJ
CARBON TETRACHLORIDE	0.5 U	0.5 UJ	0.5 U	3 U	0.5 U	0.5 UJ	0.5 U
CHLOROBENZENE	2 U	2 UJ	2 U	10 U	2 U	2 UJ	2 U
CHLOROETHANE	2 U	**0.2** J	2 U	10 U	2 U	2 UJ	2 U
CHLOROFORM	2 U	2 UJ	2 U	10 U	2 U	2 UJ	2 U
CHLOROMETHANE	2 U	2 UJ	2 U	10 U	2 U	2 UJ	2 U
CIS-1,2-DICHLOROETHENE	2 U	2 UJ	N/A	N/A	2 U	**2** J	N/A
CIS-1,3-DICHLOROPROPENE	0.5 U	0.5 UJ	0.5 U	3 U	0.5 U	0.5 UJ	0.5 U
DIBROMOCHLOROMETHANE	2 U	**0.2** J	2 U	10 U	2 U	2 UJ	2 U
ETHYLBENZENE	2 U	**0.2** J	2 U	10 U	2 U	2 UJ	2 U
METHYLENE CHLORIDE	2 UJ	2 UJ	2 U	10 UJ	2 UJ	2 UJ	2 U
STYRENE	2 U	2 UJ	2 U	10 U	2 U	2 UJ	2 U
TETRACHLOROETHENE	2 U	2 UJ	2 U	10 U	2 U	2 UJ	2 U
TOLUENE	2 U	**0.9** J	2 U	10 U	2 U	2 UJ	2 U
TRANS-1,2-DICHLOROETHENE	2 U	2 UJ	N/A	N/A	2 U	**0.5** J	N/A
TRANS-1,3-DICHLOROPROPENE	0.5 U	0.5 UJ	0.5 U	3 U	0.5 U	0.5 UJ	0.5 U
TRICHLOROETHENE	2 U	**0.2** J	2 U	10 U	**1** J	**0.2** J	2 U
VINYL CHLORIDE	0.5 U	0.5 UJ	0.5 U	3 U	0.5 U	0.5 UJ	0.5 U
XYLENE (TOTAL)	2 U	2 UJ	2 U	10 U	2 U	2 UJ	2 U

TABLE B-7 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL	SL	SL
Point Name:	SW11-61	SW11-62	SW11-63	SW11-63	SW11-63	SW11-64	SW11-64
Sample ID:	149-S11-105	149-S11-025	149-S11-026	149-S11-059	149-S11-106	149-S11-027	149-S11-060
Sample Date:	03-FEB-99	02-JUN-98	02-JUN-98	19-AUG-98	03-FEB-99	02-JUN-98	20-AUG-98
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL CREEK	MUDFLAT	MUDFLAT	MUDFLAT	MUDFLAT	MUDFLAT	MUDFLAT
VOA (ug/L)							
BROMOFORM	10 U	2 U	2 U	2 U	10 U	2 U	2 UJ
BROMOMETHANE	10 U	2 U	2 U	2 UJ	10 U	2 U	2 UJ
CARBON DISULFIDE	10 U	2 U	2 U	2 U	10 U	2 U	2 UJ
CARBON TETRACHLORIDE	3 U	0.5 U	0.5 U	0.5 U	3 U	0.5 U	0.5 UJ
CHLOROBENZENE	10 U	2 U	2 U	2 U	10 U	2 U	2 UJ
CHLOROETHANE	10 U	2 U	2 U	2 UJ	10 U	2 U	2 UJ
CHLOROFORM	10 U	2 U	2 U	2 U	10 U	2 U	2 UJ
CHLOROMETHANE	10 U	2 U	2 UJ	2 U	10 U	2 U	2 UJ
CIS-1,2-DICHLOROETHENE	N/A	**0.2** J	2 U	2 U	N/A	**0.3** J	2 UJ
CIS-1,3-DICHLOROPROPENE	3 U	0.5 U	0.5 U	0.5 U	3 U	0.5 U	0.5 UJ
DIBROMOCHLOROMETHANE	10 U	2 U	2 U	2 U	10 U	2 U	2 UJ
ETHYLBENZENE	10 U	2 U	2 U	2 U	10 U	2 U	2 UJ
METHYLENE CHLORIDE	10 UJ	2 UJ	2 UJ	2 UJ	10 UJ	2 UJ	2 UJ
STYRENE	10 U	2 U	2 U	2 U	10 U	2 U	2 UJ
TETRACHLOROETHENE	10 U	2 U	2 U	2 U	10 U	2 U	2 UJ
TOLUENE	10 U	2 U	2 U	2 U	10 U	2 U	2 UJ
TRANS-1,2-DICHLOROETHENE	N/A	2 U	2 U	2 U	N/A	2 U	2 UJ
TRANS-1,3-DICHLOROPROPENE	3 U	0.5 U	0.5 U	0.5 U	3 U	0.5 U	0.5 UJ
TRICHLOROETHENE	10 U	**0.3** J	2 U	2 U	10 U	**0.7** J	2 UJ
VINYL CHLORIDE	3 U	0.5 U	0.5 UJ	0.5 UJ	3 U	0.5 U	0.5 UJ
XYLENE (TOTAL)	10 U	2 U	2 U	2 U	10 U	2 U	2 UJ

TABLE B-7 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL	SL	SL
Point Name:	SW11-64	SW11-64	SW11-66	SW11-66	SW11-66	SW11-66	SW11-67
Sample ID:	149-S11-083	149-S11-107	149-S11-029	149-S11-063	149-S11-084	149-S11-108	149-S11-030
Sample Date:	04-NOV-98	03-FEB-99	02-JUN-98	20-AUG-98	04-NOV-98	03-FEB-99	02-JUN-98
Screen Depth (feet bgs):							
ECO Habitat:	MUDFLAT	MUDFLAT	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL CREEK
VOA (ug/L)							
BROMOFORM	2 U	10 U	2 U	2 UJ	2 U	10 U	2 U
BROMOMETHANE	2 U	10 U	2 U	2 UJ	2 U	10 U	2 U
CARBON DISULFIDE	2 UJ	10 U	2 U	2 UJ	2 UJ	10 U	2 U
CARBON TETRACHLORIDE	0.5 U	3 U	0.5 U	0.5 UJ	0.5 U	3 U	0.5 U
CHLOROBENZENE	2 U	10 U	2 U	2 UJ	2 U	10 U	2 U
CHLOROETHANE	2 U	10 U	2 U	2 UJ	2 U	10 U	2 U
CHLOROFORM	2 U	10 U	2 U	2 UJ	2 U	10 U	2 U
CHLOROMETHANE	2 U	10 U	2 U	2 UJ	2 U	10 U	2 U
CIS-1,2-DICHLOROETHENE	N/A	N/A	2 U	**0.2** J	N/A	N/A	2 U
CIS-1,3-DICHLOROPROPENE	0.5 U	3 U	0.5 U	0.5 UJ	0.5 U	3 U	0.5 U
DIBROMOCHLOROMETHANE	2 U	10 U	2 U	2 UJ	2 U	10 U	2 U
ETHYLBENZENE	2 U	10 U	2 U	2 UJ	2 U	10 U	2 U
METHYLENE CHLORIDE	2 U	10 UJ	2 UJ	2 UJ	2 U	10 UJ	2 UJ
STYRENE	2 U	10 U	2 U	2 UJ	2 U	10 U	2 U
TETRACHLOROETHENE	2 U	10 U	2 U	2 UJ	2 U	10 UJ	2 U
TOLUENE	2 U	10 U	2 U	2 UJ	2 U	10 U	2 U
TRANS-1,2-DICHLOROETHENE	N/A	N/A	2 U	2 UJ	N/A	N/A	2 U
TRANS-1,3-DICHLOROPROPENE	0.5 U	3 U	0.5 U	0.5 UJ	0.5 U	3 U	0.5 U
TRICHLOROETHENE	2 U	10 U	2 U	2 UJ	2 U	10 U	2 U
VINYL CHLORIDE	0.5 U	3 U	0.5 U	0.5 UJ	0.5 U	3 U	0.5 U
XYLENE (TOTAL)	2 U	10 U	2 U	2 UJ	2 U	10 U	2 U

TABLE B-7 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL	SL	SL
Point Name:	SW11-67	SW11-67	SW11-67	SW11-68	SW11-68	SW11-68	SW11-68
Sample ID:	149-S11-064	149-S11-085	149-S11-109	149-S11-031	149-S11-065	149-S11-086	149-S11-110
Sample Date:	20-AUG-98	04-NOV-98	03-FEB-99	02-JUN-98	20-AUG-98	04-NOV-98	03-FEB-99
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK
VOA (ug/L)							
BROMOFORM	2 UJ	2 U	10 U	2 U	2 UJ	2 U	10 U
BROMOMETHANE	2 UJ	2 U	10 U	2 U	2 UJ	2 U	10 U
CARBON DISULFIDE	2 UJ	2 UJ	10 U	2 U	2 UJ	2 UJ	10 U
CARBON TETRACHLORIDE	0.5 UJ	0.5 U	3 U	0.5 U	0.5 UJ	0.5 U	3 U
CHLOROBENZENE	2 UJ	2 U	10 U	2 U	2 UJ	2 U	10 U
CHLOROETHANE	2 UJ	2 U	10 U	2 U	2 UJ	2 U	10 U
CHLOROFORM	2 UJ	2 U	10 U	2 U	2 UJ	2 U	10 U
CHLOROMETHANE	2 UJ	2 U	10 U	2 U	2 UJ	2 UJ	10 U
CIS-1,2-DICHLOROETHENE	**2** J	N/A	N/A	**0.3** J	2 UJ	N/A	N/A
CIS-1,3-DICHLOROPROPENE	0.5 UJ	0.5 U	3 U	0.5 U	0.5 UJ	0.5 U	3 U
DIBROMOCHLOROMETHANE	2 UJ	2 U	10 U	2 U	2 UJ	2 U	10 U
ETHYLBENZENE	2 UJ	2 U	10 U	2 U	2 UJ	2 U	10 U
METHYLENE CHLORIDE	2 UJ	2 U	10 UJ	2 UJ	2 UJ	2 U	10 UJ
STYRENE	2 UJ	2 U	10 U	2 U	2 UJ	2 U	10 U
TETRACHLOROETHENE	2 UJ	2 U	10 UJ	2 U	2 UJ	2 U	10 UJ
TOLUENE	2 UJ	2 U	10 U	2 U	2 UJ	2 U	10 U
TRANS-1,2-DICHLOROETHENE	**1** J	N/A	N/A	2 U	2 UJ	N/A	N/A
TRANS-1,3-DICHLOROPROPENE	0.5 UJ	0.5 U	3 U	0.5 U	0.5 UJ	0.5 U	3 U
TRICHLOROETHENE	**0.2** J	2 U	10 U	**0.3** J	2 UJ	2 U	10 U
VINYL CHLORIDE	0.5 UJ	0.5 U	3 U	0.5 U	0.5 UJ	0.5 U	3 U
XYLENE (TOTAL)	2 UJ	2 U	10 U	2 U	2 UJ	2 U	10 U

TABLE B-7 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL	SL	SL
Point Name:	SW11-69	SW11-69	SW11-69	SW11-69	SW11-70	SW11-70	SW11-70
Sample ID:	149-S11-032	149-S11-066	149-S11-087	149-S11-111	149-S11-033	149-S11-067	149-S11-088
Sample Date:	02-JUN-98	20-AUG-98	04-NOV-98	03-FEB-99	02-JUN-98	19-AUG-98	04-NOV-98
Screen Depth (feet bgs):							
ECO Habitat:	MUDFLAT	MUDFLAT	MUDFLAT	MUDFLAT	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
VOA (ug/L)							
BROMOFORM	2 U	2 UJ	2 U	10 U	2 U	2 U	2 UJ
BROMOMETHANE	2 U	2 UJ	2 U	10 U	2 U	2 UJ	2 U
CARBON DISULFIDE	2 U	2 UJ	2 UJ	10 U	2 U	2 U	2 U
CARBON TETRACHLORIDE	0.5 U	0.5 UJ	0.5 U	3 U	0.5 U	0.5 U	0.5 UJ
CHLOROBENZENE	2 U	2 UJ	2 U	10 U	2 U	2 U	2 U
CHLOROETHANE	2 U	2 UJ	2 U	10 U	2 U	2 UJ	2 U
CHLOROFORM	2 U	2 UJ	2 U	10 U	2 U	2 U	2 U
CHLOROMETHANE	2 UJ	2 UJ	2 U	10 U	2 UJ	2 U	2 U
CIS-1,2-DICHLOROETHENE	2 U	**0.2** J	N/A	N/A	2 U	2 U	N/A
CIS-1,3-DICHLOROPROPENE	0.5 U	0.5 UJ	0.5 U	3 U	0.5 U	0.5 U	0.5 U
DIBROMOCHLOROMETHANE	2 U	2 UJ	2 U	10 U	2 U	2 U	2 U
ETHYLBENZENE	2 U	2 UJ	2 U	10 U	2 U	2 U	2 U
METHYLENE CHLORIDE	2 UJ	2 UJ	2 U	10 UJ	2 UJ	2 UJ	2 U
STYRENE	2 U	2 UJ	2 U	10 U	2 U	2 U	2 U
TETRACHLOROETHENE	2 U	2 UJ	2 U	10 U	2 U	2 U	2 U
TOLUENE	2 U	**0.8** J	2 U	10 U	2 U	2 U	2 U
TRANS-1,2-DICHLOROETHENE	2 U	2 UJ	N/A	N/A	2 U	2 U	N/A
TRANS-1,3-DICHLOROPROPENE	0.5 U	0.5 UJ	0.5 U	3 U	0.5 U	0.5 U	0.5 U
TRICHLOROETHENE	2 U	**0.2** J	2 U	10 U	2 U	2 U	2 U
VINYL CHLORIDE	0.5 UJ	0.5 UJ	0.5 U	3 U	0.5 UJ	0.5 UJ	0.5 U
XYLENE (TOTAL)	2 U	2 UJ	2 U	10 U	2 U	2 U	2 U

TABLE B-7 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL
Point Name:	SW11-70	SW11-75	SW11-75	SW11-75	SW11-75
Sample ID:	149-S11-112	149-S11-039	149-S11-073	149-S11-094	149-S11-118
Sample Date:	03-FEB-99	03-JUN-98	19-AUG-98	06-NOV-98	03-FEB-99
Screen Depth (feet bgs):					
ECO Habitat:	TIDAL MARSH	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK
VOA (ug/L)					
BROMOFORM	2 U	2 U	2 U	2 U	2 U
BROMOMETHANE	2 U	2 U	2 UJ	2 U	2 U
CARBON DISULFIDE	2 U	2 U	2 U	2 UJ	2 U
CARBON TETRACHLORIDE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLOROBENZENE	2 U	2 U	2 U	2 U	2 U
CHLOROETHANE	2 U	2 U	2 UJ	2 U	2 U
CHLOROFORM	2 UJ	2 U	2 U	2 U	2 UJ
CHLOROMETHANE	2 U	2 UJ	2 U	2 U	2 U
CIS-1,2-DICHLOROETHENE	N/A	2 U	2 U	N/A	N/A
CIS-1,3-DICHLOROPROPENE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
DIBROMOCHLOROMETHANE	2 U	2 U	2 U	2 U	2 U
ETHYLBENZENE	2 U	2 U	2 U	2 U	2 U
METHYLENE CHLORIDE	2 U	2 UJ	2 UJ	2 U	2 U
STYRENE	2 U	2 U	2 U	2 U	2 U
TETRACHLOROETHENE	2 U	2 U	2 U	2 U	2 U
TOLUENE	2 U	2 U	**0.4** J	2 U	2 U
TRANS-1,2-DICHLOROETHENE	N/A	2 U	2 U	N/A	N/A
TRANS-1,3-DICHLOROPROPENE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TRICHLOROETHENE	2 U	2 U	2 U	2 U	2 U
VINYL CHLORIDE	**0.5** J	0.5 UJ	0.5 UJ	0.5 U	**2**
XYLENE (TOTAL)	2 U	2 U	2 U	2 U	2 U

TABLE B-7 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, ORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Notes and Abbreviations:
- Detections appear in boldface type
- bgs - Below ground surface
- J - Estimated concentration
- mg/L - Milligrams per liter
- NA - Not analyzed
- SL - Surface location
- U - Not detected
- ug/L - Micrograms per liter

TABLE B-8

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, INORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL	SL	SL
Point Name:	SW11-60	SW11-60	SW11-60	SW11-60	SW11-61	SW11-61	SW11-61
Sample ID:	149-S11-022	149-S11-056	149-S11-080	149-S11-104	149-S11-023	149-S11-057	149-S11-081
Sample Date:	02-JUN-98	20-AUG-98	04-NOV-98	03-FEB-99	02-JUN-98	20-AUG-98	04-NOV-98
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK
DMETAL (ug/L)							
ALUMINUM	N/A	N/A	N/A	108 U	N/A	N/A	N/A
ANTIMONY	N/A	N/A	N/A	40 U	N/A	N/A	N/A
ARSENIC	N/A	N/A	N/A	**51.8** J	N/A	N/A	N/A
BARIUM	N/A	N/A	N/A	17.4 U	N/A	N/A	N/A
BERYLLIUM	N/A	N/A	N/A	2.2 U	N/A	N/A	N/A
CADMIUM	N/A	N/A	N/A	4.2 U	N/A	N/A	N/A
CALCIUM	N/A	N/A	N/A	**403,000**	N/A	N/A	N/A
CHROMIUM	N/A	N/A	N/A	**16** J	N/A	N/A	N/A
COBALT	N/A	N/A	N/A	8.8 U	N/A	N/A	N/A
COPPER	N/A	N/A	N/A	**51.8** J	N/A	N/A	N/A
IRON	N/A	N/A	N/A	34 U	N/A	N/A	N/A
LEAD	N/A	N/A	N/A	**20.3** J	N/A	N/A	N/A
MAGNESIUM	N/A	N/A	N/A	**1,110,000**	N/A	N/A	N/A
MANGANESE	N/A	N/A	N/A	7.4 U	N/A	N/A	N/A
MERCURY	N/A	N/A	N/A	0.11 U	N/A	N/A	N/A
MOLYBDENUM	N/A	N/A	N/A	10.2 U	N/A	N/A	N/A
NICKEL	N/A	N/A	N/A	9.4 U	N/A	N/A	N/A
POTASSIUM	N/A	N/A	N/A	**482,000** J	N/A	N/A	N/A
SELENIUM	N/A	N/A	N/A	44 U	N/A	N/A	N/A
SILVER	N/A	N/A	N/A	**7.5** J	N/A	N/A	N/A
SODIUM	N/A	N/A	N/A	**8,600,000**	N/A	N/A	N/A
THALLIUM	N/A	N/A	N/A	26 U	N/A	N/A	N/A
VANADIUM	N/A	N/A	N/A	6.4 U	N/A	N/A	N/A
ZINC	N/A	N/A	N/A	10.4 U	N/A	N/A	N/A
TMETAL (ug/L)							
ALUMINUM	**1,500**	**2,340**	**20,600**	**407** J	**111,000**	**885**	**122** J
ANTIMONY	**1.6** J	1.5 U	8 U	30 U	**4.6**	**1.9** J	40 U
ARSENIC	**2.3** J	4.2 UJ	**6.2** J	**48.8** J	**34**	3.4 UJ	26 U
BARIUM	**51.5** J	**42** J	**217** J	13.1 U	**685**	**27.8** J	17.4 U
BERYLLIUM	0.5 U	0.5 UJ	0.44 U	1.7 U	**2.3**	0.5 UJ	2.2 U
BORON	**2,190**	N/A	N/A	N/A	**4,840**	N/A	N/A
CADMIUM	0.5 U	**0.56** J	**1.1** J	3.2 U	**12.8**	0.5 UJ	4.2 U
CALCIUM	**502,000**	**300,000**	**497,000**	**354,000**	**605,000**	**432,000**	**394,000**
CHROMIUM	**36.7** J	**4.6** J	**40.1**	8 U	**149** J	**2.2** J	**11.3** J
COBALT	**1.2** J	**1.8** J	**13.9** J	6.6 U	**29.6**	**0.96** J	8.8 U
COPPER	**8.2**	**21.4**	**64.9**	**37.3** J	**190**	**4.7**	**45.7** J
IRON	**1,950**	**3,630** J	**33,500**	**172** J	**113,000**	**1,630** J	34 U

TABLE B-8 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, INORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL	SL	SL
Point Name:	SW11-61	SW11-62	SW11-63	SW11-63	SW11-63	SW11-64	SW11-64
Sample ID:	149-S11-105	149-S11-025	149-S11-026	149-S11-059	149-S11-106	149-S11-027	149-S11-060
Sample Date:	03-FEB-99	02-JUN-98	02-JUN-98	19-AUG-98	03-FEB-99	02-JUN-98	20-AUG-98
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL CREEK	MUDFLAT	MUDFLAT	MUDFLAT	MUDFLAT	MUDFLAT	MUDFLAT
DMETAL (ug/L)							
ALUMINUM	**206** J	N/A	N/A	N/A	**166** J	N/A	N/A
ANTIMONY	40 U	N/A	N/A	N/A	40 U	N/A	N/A
ARSENIC	**55.6** J	N/A	N/A	N/A	**43.2** J	N/A	N/A
BARIUM	17.4 U	N/A	N/A	N/A	17.4 U	N/A	N/A
BERYLLIUM	2.2 U	N/A	N/A	N/A	2.2 U	N/A	N/A
CADMIUM	4.2 U	N/A	N/A	N/A	4.2 U	N/A	N/A
CALCIUM	**407,000**	N/A	N/A	N/A	**417,000**	N/A	N/A
CHROMIUM	**12.6** J	N/A	N/A	N/A	**14.8** J	N/A	N/A
COBALT	8.8 U	N/A	N/A	N/A	8.8 U	N/A	N/A
COPPER	**38.4** J	N/A	N/A	N/A	**42.6** J	N/A	N/A
IRON	34 U	N/A	N/A	N/A	34 U	N/A	N/A
LEAD	**27.3** J	N/A	N/A	N/A	**17.4** J	N/A	N/A
MAGNESIUM	**1,000,000**	N/A	N/A	N/A	**1,230,000**	N/A	N/A
MANGANESE	**237** J	N/A	N/A	N/A	7.4 U	N/A	N/A
MERCURY	0.11 U	N/A	N/A	N/A	0.11 U	N/A	N/A
MOLYBDENUM	10.2 U	N/A	N/A	N/A	10.2 U	N/A	N/A
NICKEL	9.4 U	N/A	N/A	N/A	9.4 U	N/A	N/A
POTASSIUM	**423,000** J	N/A	N/A	N/A	**521,000** J	N/A	N/A
SELENIUM	44 U	N/A	N/A	N/A	44 U	N/A	N/A
SILVER	**7.7** J	N/A	N/A	N/A	5.2 U	N/A	N/A
SODIUM	**7,780,000**	N/A	N/A	N/A	**9,390,000**	N/A	N/A
THALLIUM	**41.7** J	N/A	N/A	N/A	26 U	N/A	N/A
VANADIUM	6.4 U	N/A	N/A	N/A	6.4 U	N/A	N/A
ZINC	10.4 U	N/A	N/A	N/A	10.4 U	N/A	N/A
TMETAL (ug/L)							
ALUMINUM	**6,250**	**1,750**	**71,500**	**595** J	**448** J	**2,160**	**244**
ANTIMONY	30 U	**1.8** J	**1.8** J	1.5 U	40 U	**2.1** J	1.5 U
ARSENIC	**41.3** J	**4** J	**24**	1.9 UJ	**73.6** J	**4.8** J	2.2 UJ
BARIUM	**15.7** J	**26.6** J	**346**	**11.8** J	17.4 U	**31.8** J	0.5 U
BERYLLIUM	1.7 U	0.5 U	**1.3** J	0.5 U	2.2 U	0.5 U	0.5 UJ
BORON	N/A	**4,740**	**4,830**	N/A	N/A	**4,640**	N/A
CADMIUM	3.2 U	0.5 U	**6.8**	0.5 U	4.2 U	0.5 U	0.5 UJ
CALCIUM	**412,000**	**398,000**	**454,000**	**405,000** J	**434,000**	**385,000**	**390,000**
CHROMIUM	**19.1** J	**3.5** J	**92** J	**0.98** J	10.6 U	**5.2** J	**1.5** J
COBALT	6.6 U	**0.79** J	**19** J	0.5 U	8.8 U	**0.77** J	0.5 UJ
COPPER	**46.5** J	4.1 UJ	**104**	1.6 UJ	**48.1** J	5.4 UJ	0.5 U
IRON	**10,300**	**1,020**	**67,900**	**855**	**469** J	**1,400**	**520** J

TABLE B-8 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, INORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL	SL	SL
Point Name:	SW11-64	SW11-64	SW11-66	SW11-66	SW11-66	SW11-66	SW11-67
Sample ID:	149-S11-083	149-S11-107	149-S11-029	149-S11-063	149-S11-084	149-S11-108	149-S11-030
Sample Date:	04-NOV-98	03-FEB-99	02-JUN-98	20-AUG-98	04-NOV-98	03-FEB-99	02-JUN-98
Screen Depth (feet bgs):							
ECO Habitat:	MUDFLAT	MUDFLAT	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL CREEK
DMETAL (ug/L)							
ALUMINUM	N/A	108 U	N/A	N/A	N/A	**189** J	N/A
ANTIMONY	N/A	40 U	N/A	N/A	N/A	40 U	N/A
ARSENIC	N/A	**31.4** J	N/A	N/A	N/A	**31.1** J	N/A
BARIUM	N/A	17.4 U	N/A	N/A	N/A	17.4 U	N/A
BERYLLIUM	N/A	2.2 U	N/A	N/A	N/A	2.2 U	N/A
CADMIUM	N/A	4.2 U	N/A	N/A	N/A	4.2 U	N/A
CALCIUM	N/A	**407,000**	N/A	N/A	N/A	**426,000**	N/A
CHROMIUM	N/A	**13.1** J	N/A	N/A	N/A	**13.9** J	N/A
COBALT	N/A	8.8 U	N/A	N/A	N/A	8.8 U	N/A
COPPER	N/A	**26.8** J	N/A	N/A	N/A	18.6 U	N/A
IRON	N/A	34 U	N/A	N/A	N/A	34 U	N/A
LEAD	N/A	**23** J	N/A	N/A	N/A	**28.4** J	N/A
MAGNESIUM	N/A	**1,190,000**	N/A	N/A	N/A	**1,200,000**	N/A
MANGANESE	N/A	7.4 U	N/A	N/A	N/A	7.4 U	N/A
MERCURY	N/A	0.11 U	N/A	N/A	N/A	0.11 U	N/A
MOLYBDENUM	N/A	10.2 U	N/A	N/A	N/A	10.2 U	N/A
NICKEL	N/A	9.4 U	N/A	N/A	N/A	9.4 U	N/A
POTASSIUM	N/A	**512,000** J	N/A	N/A	N/A	**527,000** J	N/A
SELENIUM	N/A	44 U	N/A	N/A	N/A	44 U	N/A
SILVER	N/A	5.2 U	N/A	N/A	N/A	5.2 U	N/A
SODIUM	N/A	**9,140,000**	N/A	N/A	N/A	**9,450,000**	N/A
THALLIUM	N/A	26 U	N/A	N/A	N/A	26 U	N/A
VANADIUM	N/A	6.4 U	N/A	N/A	N/A	6.4 U	N/A
ZINC	N/A	10.4 U	N/A	N/A	N/A	10.4 U	N/A
TMETAL (ug/L)							
ALUMINUM	108 U	108 U	**26,700**	176 UJ	108 U	**203** J	**1,520**
ANTIMONY	40 U	40 U	**2.1** J	1.5 U	40 U	40 U	1.5 U
ARSENIC	**27.2** J	**52.8** J	**13.2**	2.6 UJ	26 U	**60.9** J	**7**
BARIUM	17.4 U	17.4 U	**320**	**52** J	17.4 U	17.4 U	**55.5** J
BERYLLIUM	2.2 U	2.2 U	0.5 U	0.5 UJ	2.2 U	2.2 U	0.5 U
BORON	N/A	N/A	**6,980**	N/A	N/A	N/A	**4,800**
CADMIUM	4.2 U	4.2 U	**2.9**	0.5 UJ	4.2 U	4.2 U	0.5 U
CALCIUM	**393,000**	**400,000**	**816,000**	**538,000**	**437,000**	**422,000**	**454,000**
CHROMIUM	10.6 U	10.6 U	**26** J	**0.84** J	10.6 U	10.6 U	**3.5** J
COBALT	8.8 U	8.8 U	**5** J	0.5 UJ	8.8 U	8.8 U	**0.89** J
COPPER	**38.4** J	**30.6** J	**44.8**	1.3 UJ	**37.5** J	**19.4** J	4.3 UJ
IRON	34 U	34 U	**21,200**	**705** J	34 U	34 U	**864** J

TABLE B-8 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, INORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL	SL	SL
Point Name:	SW11-67	SW11-67	SW11-67	SW11-68	SW11-68	SW11-68	SW11-68
Sample ID:	149-S11-064	149-S11-085	149-S11-109	149-S11-031	149-S11-065	149-S11-086	149-S11-110
Sample Date:	20-AUG-98	04-NOV-98	03-FEB-99	02-JUN-98	20-AUG-98	04-NOV-98	03-FEB-99
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK
DMETAL (ug/L)							
ALUMINUM	N/A	N/A	108 U	N/A	N/A	N/A	108 U
ANTIMONY	N/A	N/A	40 U	N/A	N/A	N/A	40 U
ARSENIC	N/A	N/A	**34.4** J	N/A	N/A	N/A	**46.1** J
BARIUM	N/A	N/A	17.4 U	N/A	N/A	N/A	17.4 U
BERYLLIUM	N/A	N/A	2.2 U	N/A	N/A	N/A	2.2 U
CADMIUM	N/A	N/A	4.2 U	N/A	N/A	N/A	4.2 U
CALCIUM	N/A	N/A	**387,000**	N/A	N/A	N/A	**377,000**
CHROMIUM	N/A	N/A	**11.9** J	N/A	N/A	N/A	**11.2** J
COBALT	N/A	N/A	8.8 U	N/A	N/A	N/A	8.8 U
COPPER	N/A	N/A	18.6 U	N/A	N/A	N/A	18.6 U
IRON	N/A	N/A	34 U	N/A	N/A	N/A	34 U
LEAD	N/A	N/A	**16.3** J	N/A	N/A	N/A	**20.5** J
MAGNESIUM	N/A	N/A	**1,010,000**	N/A	N/A	N/A	**992,000**
MANGANESE	N/A	N/A	**65.4** J	N/A	N/A	N/A	**718**
MERCURY	N/A	N/A	0.11 U	N/A	N/A	N/A	0.11 U
MOLYBDENUM	N/A	N/A	10.2 U	N/A	N/A	N/A	10.2 U
NICKEL	N/A	N/A	9.4 U	N/A	N/A	N/A	9.4 U
POTASSIUM	N/A	N/A	**424,000** J	N/A	N/A	N/A	**414,000** J
SELENIUM	N/A	N/A	44 U	N/A	N/A	N/A	44 U
SILVER	N/A	N/A	**8.3** J	N/A	N/A	N/A	**5.8** J
SODIUM	N/A	N/A	**7,840,000**	N/A	N/A	N/A	**7,710,000**
THALLIUM	N/A	N/A	26 U	N/A	N/A	N/A	26 U
VANADIUM	N/A	N/A	6.4 U	N/A	N/A	N/A	6.4 U
ZINC	N/A	N/A	10.4 U	N/A	N/A	N/A	10.4 U
TMETAL (ug/L)							
ALUMINUM	**735**	108 U	105 UJ	**62** J	**230**	108 U	**435** J
ANTIMONY	1.5 U	40 U	30 U	1.5 U	1.5 U	40 U	30 U
ARSENIC	1.5 U	26 U	**43** J	**6**	2.5 UJ	26 U	**43.9** J
BARIUM	**21.6** J	17.4 U	13.1 U	**59** J	**22.4** J	17.4 U	13.1 U
BERYLLIUM	0.5 UJ	2.2 U	1.7 U	0.5 U	0.5 UJ	2.2 U	1.7 U
BORON	N/A	N/A	N/A	**2,880**	N/A	N/A	N/A
CADMIUM	0.5 UJ	4.2 U	3.2 U	0.5 U	0.5 UJ	4.2 U	3.2 U
CALCIUM	**400,000**	**388,000**	**394,000**	**233,000**	**415,000**	**400,000**	**390,000**
CHROMIUM	**1.3** J	10.6 U	**8.6** J	1.2 UJ	**0.8** J	10.6 U	8.5 UJ
COBALT	0.5 UJ	8.8 U	6.6 U	0.5 U	**0.5** J	8.8 U	6.6 U
COPPER	2.9 UJ	**34.4** J	**19.8** J	4.5 UJ	0.96 UJ	**30.4** J	**21.5** J
IRON	**1,110** J	34 U	**207** J	500 U	**510** J	34 U	**1,710**

TABLE B-8 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, INORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL	SL	SL
Point Name:	SW11-69	SW11-69	SW11-69	SW11-69	SW11-70	SW11-70	SW11-70
Sample ID:	149-S11-032	149-S11-066	149-S11-087	149-S11-111	149-S11-033	149-S11-067	149-S11-088
Sample Date:	02-JUN-98	20-AUG-98	04-NOV-98	03-FEB-99	02-JUN-98	19-AUG-98	04-NOV-98
Screen Depth (feet bgs):							
ECO Habitat:	MUDFLAT	MUDFLAT	MUDFLAT	MUDFLAT	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
DMETAL (ug/L)							
ALUMINUM	N/A	N/A	N/A	**109** J	N/A	N/A	N/A
ANTIMONY	N/A	N/A	N/A	40 U	N/A	N/A	N/A
ARSENIC	N/A	N/A	N/A	**41.2** J	N/A	N/A	N/A
BARIUM	N/A	N/A	N/A	17.4 U	N/A	N/A	N/A
BERYLLIUM	N/A	N/A	N/A	2.2 U	N/A	N/A	N/A
CADMIUM	N/A	N/A	N/A	4.2 U	N/A	N/A	N/A
CALCIUM	N/A	N/A	N/A	**380,000**	N/A	N/A	N/A
CHROMIUM	N/A	N/A	N/A	10.6 U	N/A	N/A	N/A
COBALT	N/A	N/A	N/A	8.8 U	N/A	N/A	N/A
COPPER	N/A	N/A	N/A	18.6 U	N/A	N/A	N/A
IRON	N/A	N/A	N/A	34 U	N/A	N/A	N/A
LEAD	N/A	N/A	N/A	16.2 U	N/A	N/A	N/A
MAGNESIUM	N/A	N/A	N/A	**1,020,000**	N/A	N/A	N/A
MANGANESE	N/A	N/A	N/A	**36.6** J	N/A	N/A	N/A
MERCURY	N/A	N/A	N/A	0.11 U	N/A	N/A	N/A
MOLYBDENUM	N/A	N/A	N/A	10.2 U	N/A	N/A	N/A
NICKEL	N/A	N/A	N/A	9.4 U	N/A	N/A	N/A
POTASSIUM	N/A	N/A	N/A	**431,000** J	N/A	N/A	N/A
SELENIUM	N/A	N/A	N/A	44 U	N/A	N/A	N/A
SILVER	N/A	N/A	N/A	**6.8** J	N/A	N/A	N/A
SODIUM	N/A	N/A	N/A	**7,890,000**	N/A	N/A	N/A
THALLIUM	N/A	N/A	N/A	26 U	N/A	N/A	N/A
VANADIUM	N/A	N/A	N/A	6.4 U	N/A	N/A	N/A
ZINC	N/A	N/A	N/A	10.4 U	N/A	N/A	N/A
TMETAL (ug/L)							
ALUMINUM	**152**	114 UJ	108 U	81 U	**655**	**2,150** J	**222** J
ANTIMONY	1.5 U	1.5 U	40 U	30 U	**1.7** J	1.5 U	20 U
ARSENIC	**3.9** J	1.9 UJ	26 U	**31.4** J	**4.6** J	**11.9**	13 U
BARIUM	**46** J	**59.5** J	17.4 U	13.1 U	**49** J	**71.5** J	**30.9** J
BERYLLIUM	0.5 U	0.5 UJ	2.2 U	1.7 U	0.5 U	0.5 U	1.1 U
BORON	**4,660**	N/A	N/A	N/A	**2,310**	N/A	N/A
CADMIUM	0.5 U	0.5 UJ	4.2 U	3.2 U	0.5 U	**0.88** J	2.1 U
CALCIUM	**425,000**	**458,000**	**401,000**	**388,000**	**390,000**	**453,000** J	**326,000**
CHROMIUM	**12.8** J	**0.94** J	10.6 U	8.3 UJ	1.7 UJ	**3.5** J	5.3 U
COBALT	0.5 U	0.5 UJ	8.8 U	6.6 U	**0.95** J	**1.6** J	4.4 U
COPPER	1.8 UJ	1.2 UJ	**36.2** J	14.8 UJ	**7.6**	**24.6**	17.9 UJ
IRON	500 U	**1,000** J	34 U	25.5 U	**722** J	**7,350**	**340** J

TABLE B-8 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, INORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL
Point Name:	SW11-70	SW11-75	SW11-75	SW11-75	SW11-75
Sample ID:	149-S11-112	149-S11-039	149-S11-073	149-S11-094	149-S11-118
Sample Date:	03-FEB-99	03-JUN-98	19-AUG-98	06-NOV-98	03-FEB-99
Screen Depth (feet bgs):					
ECO Habitat:	TIDAL MARSH	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK
DMETAL (ug/L)					
ALUMINUM	**49.4** J	N/A	N/A	N/A	27 U
ANTIMONY	10 U	N/A	N/A	N/A	10 U
ARSENIC	**11.7** J	N/A	N/A	N/A	**12.7** J
BARIUM	**29.9** J	N/A	N/A	N/A	**28** J
BERYLLIUM	0.55 U	N/A	N/A	N/A	0.55 UJ
CADMIUM	1.1 U	N/A	N/A	N/A	1.1 UJ
CALCIUM	**353,000**	N/A	N/A	N/A	**467,000**
CHROMIUM	**4.8** J	N/A	N/A	N/A	3.7 UJ
COBALT	2.2 U	N/A	N/A	N/A	2.2 U
COPPER	**12.6** J	N/A	N/A	N/A	**13.8** J
IRON	8.5 U	N/A	N/A	N/A	8.5 U
LEAD	4.1 U	N/A	N/A	N/A	**4.6** J
MAGNESIUM	**320,000**	N/A	N/A	N/A	**327,000**
MANGANESE	**257**	N/A	N/A	N/A	**110**
MERCURY	0.11 U	N/A	N/A	N/A	0.11 U
MOLYBDENUM	**26.5**	N/A	N/A	N/A	**70.5**
NICKEL	5 UJ	N/A	N/A	N/A	**7.1** J
POTASSIUM	**108,000** J	N/A	N/A	N/A	**103,000** J
SELENIUM	11 U	N/A	N/A	N/A	11 UJ
SILVER	**3** J	N/A	N/A	N/A	**2.3** J
SODIUM	**1,980,000**	N/A	N/A	N/A	**1,970,000**
THALLIUM	6.5 U	N/A	N/A	N/A	6.5 UJ
VANADIUM	1.6 U	N/A	N/A	N/A	2.7 UJ
ZINC	4.1 UJ	N/A	N/A	N/A	**7.1** J
TMETAL (ug/L)					
ALUMINUM	**595**	**2,150**	**1,410** J	**691**	**316**
ANTIMONY	10 U	1.5 U	1.5 U	2 U	10 U
ARSENIC	**16.9** J	1.5 U	2.2 UJ	**2.7** J	**12.6** J
BARIUM	**30.2** J	**57** J	**53.5** J	**50.4** J	**30.6** J
BERYLLIUM	0.55 U	0.5 U	0.5 U	0.11 U	0.55 UJ
BORON	N/A	**2,000**	N/A	N/A	N/A
CADMIUM	1.1 U	**0.54** J	0.5 U	0.21 U	1.1 UJ
CALCIUM	**362,000**	**460,000**	**468,000** J	**469,000**	**490,000**
CHROMIUM	3.9 UJ	3.6 UJ	**2.5** J	0.53 U	3.8 UJ
COBALT	2.2 U	**1.4** J	**1.2** J	1.4 UJ	2.2 U
COPPER	11.8 UJ	**15.5**	**9**	11.6 UJ	11.7 UJ
IRON	**728**	**2,910**	**1,920**	**1,280**	**603**

TABLE B-8 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, INORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL	SL	SL
Point Name:	SW11-60	SW11-60	SW11-60	SW11-60	SW11-61	SW11-61	SW11-61
Sample ID:	149-S11-022	149-S11-056	149-S11-080	149-S11-104	149-S11-023	149-S11-057	149-S11-081
Sample Date:	02-JUN-98	20-AUG-98	04-NOV-98	03-FEB-99	02-JUN-98	20-AUG-98	04-NOV-98
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK
TMETAL (ug/L)							
LEAD	1 U	**3.3**	**20.4**	12.2 U	**49.8**	**1.2** J	16.2 U
MAGNESIUM	**177,000**	**611,000**	**282,000**	**631,000**	**1,350,000**	**1,350,000**	**1,140,000**
MANGANESE	**205**	**244** J	**618**	**69.5** J	**2,480**	**140** J	7.4 U
MERCURY	0.1 U	0.1 UJ	0.12 UJ	1.7 U	**0.25**	0.1 UJ	0.18 UJ
MOLYBDENUM	**91.5**	**37.2** J	**70.8**	**40.4** J	**37.4**	**11.8** J	**21.4** J
NICKEL	**10.2**	**16.5** J	**40.7**	7.1 U	**126**	**18** J	9.4 U
POTASSIUM	**21,200** J	**184,000**	**78,400**	**254,000** J	**441,000**	**420,000**	**425,000**
SELENIUM	**8** J	**2.3** J	8.8 U	33 U	1 U	1 U	44 U
SILVER	0.5 U	0.5 U	1 U	**5.6** J	**1.5**	0.5 U	5.2 U
SODIUM	**688,000**	**4,520,000**	**1,670,000**	**4,930,000**	**10,300,000**	**10,500,000**	**9,310,000**
THALLIUM	1.5 UJ	1.5 UJ	6.6 UJ	19.5 U	**16.6**	1.5 UJ	**88.6** J
VANADIUM	**8.8** J	**14.6** J	**71.3** J	4.8 U	**269**	**5.8** J	6.4 U
ZINC	13.2 UJ	**108** J	**167**	**9.5** J	**298**	10 UJ	10.4 U

TABLE B-8 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, INORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL	SL	SL
Point Name:	SW11-61	SW11-62	SW11-63	SW11-63	SW11-63	SW11-64	SW11-64
Sample ID:	149-S11-105	149-S11-025	149-S11-026	149-S11-059	149-S11-106	149-S11-027	149-S11-060
Sample Date:	03-FEB-99	02-JUN-98	02-JUN-98	19-AUG-98	03-FEB-99	02-JUN-98	20-AUG-98
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL CREEK	MUDFLAT	MUDFLAT	MUDFLAT	MUDFLAT	MUDFLAT	MUDFLAT
TMETAL (ug/L)							
LEAD	12.2 U	1 U	**32.8**	1 U	16.2 U	**1.1** J	1 U
MAGNESIUM	**1,020,000**	**1,080,000**	**1,190,000**	**1,280,000**	**1,290,000**	**1,050,000**	**1,250,000**
MANGANESE	**321**	**39.2**	**875**	**19.2**	7.4 U	**45.2**	0.5 UJ
MERCURY	1.7 U	0.1 U	**0.16** J	0.1 U	2.2 U	0.1 U	0.1 UJ
MOLYBDENUM	**15.3** J	**16.8**	**21**	**7.5**	10.2 U	**22.7**	**9** J
NICKEL	**10.8** J	**15.8**	**78.5**	**15.3**	9.4 U	**16**	**13.4** J
POTASSIUM	**420,000** J	**369,000**	**423,000**	**398,000**	**547,000** J	**360,000**	**388,000**
SELENIUM	33 U	1 U	1 U	1 U	44 U	1.9 UJ	1 U
SILVER	3.9 U	0.5 U	**1**	0.5 U	5.2 U	0.5 U	0.5 U
SODIUM	**7,990,000**	**8,680,000**	**9,700,000**	**9,730,000** J	**10,300,000**	**8,530,000**	**9,550,000**
THALLIUM	19.5 U	1.5 UJ	**6.9**	1.5 UJ	26 U	1.5 UJ	1.5 UJ
VANADIUM	**19.9** J	**8** J	**164**	**4.2** J	6.4 U	**8.2** J	**2.6** J
ZINC	**22.1** J	7.1 UJ	**182**	**13**	10.4 U	8.9 UJ	2 UJ

TABLE B-8 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, INORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL	SL	SL
Point Name:	SW11-64	SW11-64	SW11-66	SW11-66	SW11-66	SW11-66	SW11-67
Sample ID:	149-S11-083	149-S11-107	149-S11-029	149-S11-063	149-S11-084	149-S11-108	149-S11-030
Sample Date:	04-NOV-98	03-FEB-99	02-JUN-98	20-AUG-98	04-NOV-98	03-FEB-99	02-JUN-98
Screen Depth (feet bgs):							
ECO Habitat:	MUDFLAT	MUDFLAT	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH	TIDAL CREEK
TMETAL (ug/L)							
LEAD	**19.9** J	16.2 U	**13.1**	1 U	16.2 U	16.2 U	1 U
MAGNESIUM	**1,170,000**	**1,190,000**	**2,160,000**	**1,680,000**	**1,280,000**	**1,210,000**	**1,150,000**
MANGANESE	7.4 U	7.4 U	**236**	**103** J	**23.2** J	7.4 U	**218**
MERCURY	0.11 U	2.2 U	**0.11** J	0.1 UJ	0.11 U	2.2 U	0.1 U
MOLYBDENUM	**10.4** J	10.2 U	**13.2**	**11** J	10.2 U	10.2 U	**19.7**
NICKEL	9.4 U	9.4 U	**39.6**	**18** J	9.4 U	9.4 U	**17**
POTASSIUM	**433,000**	**505,000** J	**660,000**	**532,000**	**476,000**	**525,000** J	**390,000**
SELENIUM	44 U	44 U	1 U	1 U	44 U	44 U	1 U
SILVER	5.2 U	5.2 U	0.5 U	0.5 U	5.2 U	5.2 U	0.5 U
SODIUM	**9,500,000**	**9,560,000**	**16,600,000**	**13,100,000**	**10,300,000**	**9,910,000**	**9,250,000**
THALLIUM	**67.9** J	26 U	1.5 UJ	1.5 UJ	**76.6** J	26 U	1.5 UJ
VANADIUM	6.4 U	6.4 U	**45.8**	**3** J	6.4 U	6.4 U	**7.5** J
ZINC	16.6 UJ	10.4 U	**59**	2.9 UJ	10.4 U	10.4 U	8.2 UJ

TABLE B-8 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, INORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL	SL	SL
Point Name:	SW11-67	SW11-67	SW11-67	SW11-68	SW11-68	SW11-68	SW11-68
Sample ID:	149-S11-064	149-S11-085	149-S11-109	149-S11-031	149-S11-065	149-S11-086	149-S11-110
Sample Date:	20-AUG-98	04-NOV-98	03-FEB-99	02-JUN-98	20-AUG-98	04-NOV-98	03-FEB-99
Screen Depth (feet bgs):							
ECO Habitat:	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK
TMETAL (ug/L)							
LEAD	**1.2** J	16.2 U	12.2 U	1 U	1 U	16.2 U	**14.7** J
MAGNESIUM	**1,220,000**	**1,120,000**	**1,040,000**	**549,000**	**1,300,000**	**1,140,000**	**1,040,000**
MANGANESE	**30.7** J	7.4 U	**69.7** J	**336**	**31.4** J	**125** J	**721**
MERCURY	0.1 UJ	0.11 U	1.7 U	0.1 U	0.1 UJ	0.11 U	0.113 U
MOLYBDENUM	**9.2** J	10.2 U	7.7 U	**24.2**	**9** J	10.2 U	7.7 U
NICKEL	**14.4** J	9.4 U	7.1 U	**9**	**14.8** J	9.4 U	7.1 U
POTASSIUM	**382,000**	**412,000**	**425,000** J	**194,000**	**412,000**	**403,000**	**422,000** J
SELENIUM	1 U	44 U	33 U	2.1 UJ	1 U	44 U	33 U
SILVER	0.5 U	5.2 U	3.9 U	0.5 U	0.5 U	5.2 U	3.9 U
SODIUM	**9,380,000**	**9,090,000**	**8,140,000**	**4,190,000**	**10,400,000**	**9,050,000**	**8,050,000**
THALLIUM	1.5 UJ	**96.4** J	19.5 U	1.5 UJ	1.5 UJ	**82.1** J	19.5 U
VANADIUM	**5.6** J	6.4 U	4.8 U	**4.3** J	**3.6** J	6.4 U	4.8 U
ZINC	5.6 UJ	10.4 U	7.8 U	5.4 UJ	2.8 UJ	10.4 U	7.8 U

TABLE B-8 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, INORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL	SL	SL
Point Name:	SW11-69	SW11-69	SW11-69	SW11-69	SW11-70	SW11-70	SW11-70
Sample ID:	149-S11-032	149-S11-066	149-S11-087	149-S11-111	149-S11-033	149-S11-067	149-S11-088
Sample Date:	02-JUN-98	20-AUG-98	04-NOV-98	03-FEB-99	02-JUN-98	19-AUG-98	04-NOV-98
Screen Depth (feet bgs):							
ECO Habitat:	MUDFLAT	MUDFLAT	MUDFLAT	MUDFLAT	TIDAL MARSH	TIDAL MARSH	TIDAL MARSH
TMETAL (ug/L)							
LEAD	1 U	1 U	16.2 U	12.2 U	1 U	**7.2**	8.1 U
MAGNESIUM	**1,160,000**	**1,360,000**	**1,150,000**	**1,060,000**	**263,000**	**693,000**	**627,000**
MANGANESE	**116**	**262** J	7.4 U	**43.9** J	**178**	**630**	**165**
MERCURY	0.1 U	0.1 UJ	0.11 U	0.113 U	0.1 U	0.1 U	0.11 U
MOLYBDENUM	**16**	**12** J	10.2 U	7.7 U	**49.1**	**22.9**	**15.4** J
NICKEL	**15**	**17** J	9.4 U	7.1 U	**10.5**	**18.1**	4.7 U
POTASSIUM	**397,000**	**420,000**	**432,000**	**435,000** J	**58,600**	**201,000**	**221,000**
SELENIUM	1 U	1 U	44 U	33 U	4.6 UJ	3.1 UJ	22 U
SILVER	0.5 U	0.5 U	5.2 U	3.9 U	0.5 U	0.5 U	2.6 U
SODIUM	**9,500,000**	**10,300,000**	**9,330,000**	**8,230,000**	**1,560,000**	**4,960,000** J	**4,730,000**
THALLIUM	1.5 UJ	1.5 UJ	**69.6** J	19.5 U	1.5 UJ	1.5 UJ	**35.2** J
VANADIUM	**2.7** J	**2.6** J	6.4 U	4.8 U	**7.5** J	**14.4** J	3.2 U
ZINC	4.4 UJ	3.1 UJ	10.4 U	7.8 U	9.6 UJ	**48**	5.2 U

TABLE B-8 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, INORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Point Type:	SL	SL	SL	SL	SL
Point Name:	SW11-70	SW11-75	SW11-75	SW11-75	SW11-75
Sample ID:	149-S11-112	149-S11-039	149-S11-073	149-S11-094	149-S11-118
Sample Date:	03-FEB-99	03-JUN-98	19-AUG-98	06-NOV-98	03-FEB-99
Screen Depth (feet bgs):					
ECO Habitat:	TIDAL MARSH	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK	TIDAL CREEK
TMETAL (ug/L)					
LEAD	4.1 U	**1.4** J	**1.8**	1.7 UJ	**4.7** J
MAGNESIUM	**340,000**	**132,000**	**122,000**	**124,000**	**349,000**
MANGANESE	**288**	**186**	**178**	**140**	**123**
MERCURY	0.11 U	0.1 U	0.1 U	0.13 UJ	0.11 U
MOLYBDENUM	**33.8**	**88**	**76**	**74.7**	**74.7**
NICKEL	4.8 UJ	9.7 UJ	**8.9** J	**5.6** J	4.8 UJ
POTASSIUM	**113,000** J	**16,600** J	**13,000**	**13,900**	**110,000** J
SELENIUM	11 U	**8** J	6.2 UJ	2.2 UJ	11 UJ
SILVER	1.3 U	0.5 U	0.5 U	0.26 U	1.3 U
SODIUM	**2,160,000**	**362,000** J	**411,000** J	**337,000**	**2,160,000**
THALLIUM	6.5 U	1.5 UJ	1.5 UJ	1.3 U	6.5 UJ
VANADIUM	1.6 U	**9.6** J	**7.6** J	**4.6** J	3.8 UJ
ZINC	2.9 UJ	20.4 UJ	**21.7** J	**16.4** J	**19.2** J

TABLE B-8 (Continued)

REMEDIAL INVESTIGATION, ANALYTICAL RESULTS IN SURFACE WATER, INORGANICS
POINT MUGU NAVAL BASE, CALIFORNIA

Notes and Abbreviations:
- Detections appear in boldface type
- bgs - Below ground surface
- J - Estimated concentration
- NA - Not analyzed
- SL - Surface location
- U - Not detected
- ug/L - Micrograms per liter

APPENDIX C
HUMAN HEALTH RISK ASSESSMENT SUMMARIES

APPENDIX C
CONTENTS

C.1 INTRODUCTION C-1

C.2 RESULTS OF THE HUMAN HEALTH RISK ASSESSMENT IN THE RI AND RI ADDENDUM C-1

C.2.1 Identification of Chemicals of Potential Concern C-2

C.2.2 Exposure Assessment C-2

C.2.3 Toxicity Assessment C-4

C.2.4 Risk Characterization C-4

C.3 RESULTS OF THE HUMAN HEALTH RISK ASSESSMENT IN THE RI FOR GROUNDWATER C-5

C.3.1 Identification of Chemicals of Potential Concern C-5

C.3.2 Exposure Assessment C-5

C.3.3 Toxicity Assessment C-6

C.3.4 Risk Characterization C-6

C.4 HUMAN HEALTH RISK ASSESSMENT CONCLUSIONS C-8

C.5 REFERENCES C-9

APPENDIX C
FIGURES

C-1 Conceptual Site Exposure Model Human Health Risk Assessment C-3

APPENDIX C
HUMAN HEALTH RISK ASSESSMENT SUMMARIES

C.1 INTRODUCTION

Human health risk assessments (HHRA) were conducted as part of the remedial investigations for Site 1 of the Naval Base Ventura County (NBVC) Point Mugu Installation Restoration Program (IRP), to characterize potential health risks under current land use conditions and anticipated future land use scenarios that may be posed by chemicals of potential concern (COPC) at the site, as required by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (Title 40 Code of Federal Regulations 300.430). IRP Site 1 was the location of lowland filling, dredge materials storage, and solid waste landfilling and burning operations from its development in 1952 until it was closed in 1975. Three disposal or potential source areas exist for IRP Site 1, including the Solid Waste Fill Area, Northern Burn and Fill Area, and the Southern Burn and Fill Area.

HHRAs were performed to develop the phase 1 remedial investigation (RI) technical memorandum (Tetra Tech EM Inc. [Tetra Tech] 2000) and the RI addendum for IRP Site 1 (Tetra Tech 2001), to evaluate potential human health risks associated with exposure to COPCs in IRP Site 1 landfill soils. As part of the RI for groundwater (Tetra Tech 2004), an additional HHRA was conducted to evaluate the potential for human health risks associated with exposure to COPCs that may migrate from IRP Site 1 soil and groundwater, to surface water at the Mugu Lagoon (IRP Site 11), situated immediately adjacent to IRP Site 1. The HHRAs provide information for risk managers to evaluate whether action is warranted to mitigate potential health effects from exposure to IRP Site 1 chemicals.

This appendix presents the results and conclusions of HHRAs conducted at IRP Site 1. Sections C.2 and C.3 present a detailed description of the HHRAs discussed in the RI (Tetra Tech 2000), RI addendum (Tetra Tech 2001), and RI for groundwater (Tetra Tech 2004). Section C.4 presents the overall conclusions of the human health risk associated with exposure to COPCs in soil and surface water at IRP Site 1. Health risks associated with groundwater were not evaluated because groundwater quality does not meet drinking water criteria (Tetra Tech 2000).

C.2 RESULTS OF THE HUMAN HEALTH RISK ASSESSMENT IN THE RI AND RI ADDENDUM

An HHRA was performed for IRP Site 1 soils as part of the RI (Tetra Tech 2000) and RI addendum (Tetra Tech 2001) to assess potential human health risks associated with exposure to COPCs in IRP Site 1 landfill soils. The HHRA performed for IRP Site 1 soils included the identification of COPCs, an exposure assessment, a toxicity assessment, a risk characterization, and a discussion of the uncertainties associated with the HHRA and its assumptions. The methods used in the HHRA are described in detail in Section 4.4 of the phase 1 RI (Tetra Tech 2000). The HHRA performed in the RI and RI addendum focused on COPCs identified in soil; health risks from exposure to COPCs identified in surface water were evaluated separately in the RI for groundwater (see Section C.3).

C.2.1 IDENTIFICATION OF CHEMICALS OF POTENTIAL CONCERN

COPCs in soil were identified using a three-step screening process: comparison to background (inorganic chemicals only); frequency of detection screen, and comparison to adjusted U.S. Environmental Protection Agency (EPA) Region 9 preliminary remediation goals (PRG) (see Appendix L of Tetra Tech 2000). The soil COPCs identified for IRP Site 1 included semivolatile organic compounds (SVOC), including polycyclic aromatic hydrocarbons (PAH); pesticides; polychlorinated biphenyls (PCB); dioxins; and inorganic chemicals, including lead.

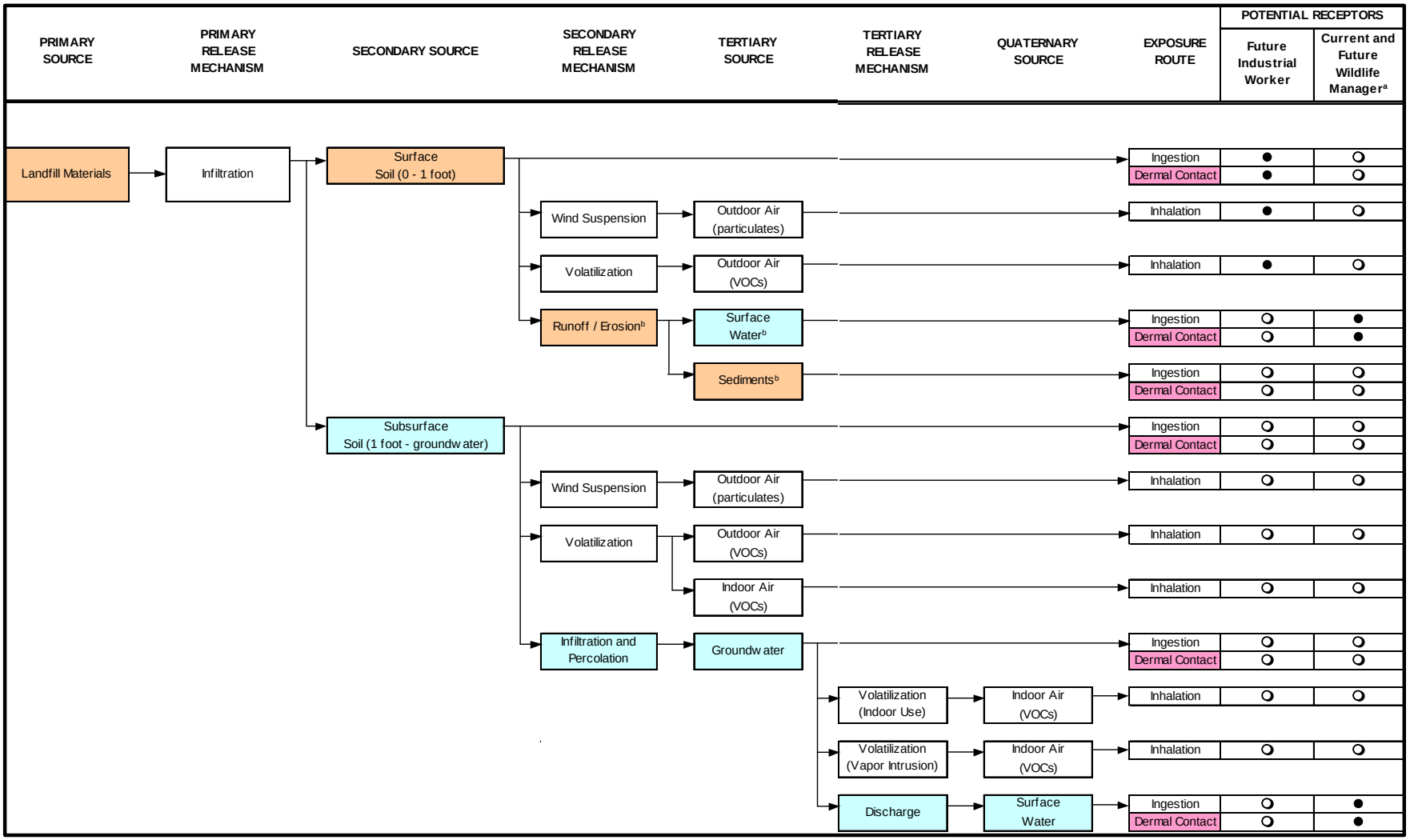
C.2.2 EXPOSURE ASSESSMENT

The exposure assessment involved the identification of potential receptors and exposure pathways, estimation of COPC concentrations at the point of exposure, and estimation of COPC doses to potential human receptors. Figure C-1 summarizes the sources of COPCs at IRP Site 1, affected environmental media, COPC release and transport mechanisms that may occur at the site, and the potential exposure pathways through which human receptors can come into contact with COPCs. Exposure pathways that were identified as potentially complete were assessed for potential risks in the HHRA; the identified potentially complete exposure pathways are discussed below.

Currently, the surface of IRP Site 1 is composed mainly of exposed soil with partially paved and vegetated areas. The site is under the ownership and control of NBVC Point Mugu, and is intended to remain so in the foreseeable future. NBVC Point Mugu intends that the future use of IRP Site 1 will be as a storage yard. Because the site is currently off limits to NAS personnel, a current exposure scenario was not evaluated in the HHRA. However, once a remedy is implemented for the site, workers may access the site. For this reason, a future industrial worker exposure scenario was evaluated in the HHRA.

Exposures to COPCs under a future industrial worker exposure scenario may occur from incidental soil ingestion, dermal contact with soil, and inhalation of volatile and particulate air emissions from soil. Potential exposure to both surface soil (defined as the soil interval from 0 to 1 foot below ground surface [bgs]) and subsurface soil (defined as the soil interval from 1 foot bgs to groundwater) was evaluated for the industrial worker exposure scenario. This approach is conservative because actual exposures under a future industrial worker scenario are expected to be limited to surface soil; required maintenance of a containment system for the landfill at Site 1 is expected to preclude any disturbance of subsurface soils. A future residential exposure scenario was not evaluated because required maintenance of the landfill containment system will preclude residential use of the site (EPA 1993). Similarly, a construction worker exposure scenario was not evaluated because maintenance of the landfill containment system will preclude excavation.

Analytical data from IRP Site 1 surface and subsurface soil samples were used to calculate soil exposure point concentrations (EPC) for COPCs. Detections of COPCs in surface soil were limited; the majority of COPC detections were in subsurface soil. Air EPCs were calculated from soil EPCs using a particulate emission factor. Soil and air EPCs were calculated for both average and reasonable maximum exposure (RME) scenarios. Average daily doses and lifetime average daily doses associated with future exposure pathways were calculated using the EPCs and assumptions for exposure and contact rates (see Tetra Tech 2000).



LEGEND

IRP	Installation Restoration Program
○	Incomplete or negligible exposure pathway
●	Potentially complete exposure pathway
VOC	Volatile organic compound
a	The future wildlife manager was identified as receptor at the Mugu Lagoon (IRP Site 11). This receptor is assumed to be indirectly exposed to Site 1 chemicals of potential concern (COPCs) as a result of potential releases of IRP Site 1 COPCs to the laboon from surface runoff and groundwater discharge.
b	Surface water runoff only occurs intermittently at Site 1 during storm events; surface water and sediments are not considered exposure media at Site 1.

Tetra Tech EM Inc.

NBVC POINT MUGU, CALIFORNIA
U.S. Navy Southwest Division, NAVFAC, San Diego

FIGURE C-1
CONCEPTUAL SITE EXPOSURE MODEL
HUMAN HEALTH RISK ASSESSMENT

Revised FS IRP Site 1
DS.A007.10571

2004-02-05 R:\Navy\Point Mugu\cto-368\ FIG C-1.dwg TtEMI-SA deborah.ford

C.2.3 TOXICITY ASSESSMENT

A toxicity assessment provides information on the toxicity of COPCs, including dose-response values. Methods for assessing chemical toxicity and toxicity profiles for the COPCs identified at IRP Site 1 are presented in Section 4.4 and Appendices L and O of the RI (Tetra Tech 2000).

C.2.4 RISK CHARACTERIZATION

The risk characterization summarizes the estimated human health risks associated with future land use scenarios and identifies COPCs with estimated excess lifetime cancer risks (ELCR) greater than 10^{-4} or hazard quotients (HQ) greater than 1.0. As defined by the NCP, acceptable exposure levels to known or suspected carcinogens are generally concentration levels that represent a ELCR of between 10^{-4} to 10^{-6} to an individual, based on a dose-response relationship. These levels are considered generally acceptable for industrial workers under an industrial land-use scenario. The point of departure is 10^{-6}, and risk below that level can be interpreted as unconditionally acceptable for any future industrial land use. Risk that exceeds 10^{-4} is considered significant, and a hazard index (HI) that exceeds 1.0 indicates the potential for health effects. COPCs with concentration levels that represent an ELCR greater than 10^{-4} or a HQ greater than 1.0 are considered chemicals of concern (COC).

The estimated RME ELCR under a future industrial worker exposure scenario at IRP Site 1, as calculated in the RI (Tetra Tech 2000), was 6.6×10^{-6}. Benzo(a)pyrene, Aroclor-1242, and Aroclor-1254 contributed most to the ELCR; risks associated with these COPCs were 3.3×10^{-6}, 1.4×10^{-6}, and 1.2×10^{-6}, respectively. Soil ingestion and dermal contact with soil were the exposure pathways that contributed most to the ELCR. Cancer risks associated with these pathways were 3.7×10^{-7} and 6.3×10^{-6}, respectively. The RME HI under a future industrial worker exposure scenario was 0.1.

Industrial exposure to lead was assessed using the California blood lead model (see Appendix L of Tetra Tech 2000). A site-specific benchmark soil concentration of 70 milligrams per kilogram (mg/kg) was derived using the model for IRP Site 1; however, this benchmark concentration is for protection of children in a residential exposure setting. The EPC for lead in soil at IRP Site 1 is 595 mg/kg (RME). Although the lead EPC exceeds the residential soil lead benchmark concentration of 70 mg/kg, the EPC does not exceed the EPA (2000) Region 9 industrial PRG of 750 mg/kg for lead in soil.

None of the COPCs identified in the phase 1 RI HHRA (benzo(a)pyrene, Aroclor-1242, and Aroclor-1254) was detected during the RI addendum investigation (Tetra Tech 2001). The COPCs identified in the RI addendum were 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) and benzo(b)fluoranthene. The estimated risks associated with exposure to 2,3,7,8-TCDD and benzo(b)fluoranthene, as calculated in the RI addendum HHRA, were 1×10^{-5} and 1×10^{-7}, respectively. The addition of the ELCR estimated in the RI addendum to the ELCR estimated during the phase 1 RI HHRA results in a total ELCR from exposure to COPCs in IRP Site 1

landfill soils of 2×10^{-5}. The total ELCR is within the risk management range of 10^{-6} to 10^{-4} that EPA considers acceptable for industrial land use scenarios.

The estimated ELCR and HI for industrial exposure to soil at IRP Site 1 are conservative and likely to represent an overestimate of actual risks. The ELCR and HI ELCR are based on the assumption that industrial workers may be exposed to both surface and subsurface soil; however, actual exposures are expected to be limited to surface soil. Required maintenance of a containment system for the landfill is expected to preclude any disturbance of, and hence contact with, subsurface soils.

C.3 RESULTS OF THE HUMAN HEALTH RISK ASSESSMENT IN THE RI FOR GROUNDWATER

The HHRA in the RI for groundwater (Tetra Tech 2004) evaluated the potential for human health risks associated with exposure to COPCs that may migrate from IRP Site 1 soil and groundwater to surface water at the Mugu Lagoon. Surface water samples were collected as part of the RI for groundwater. The methods used to assess health risk from exposure to surface water in the RI for groundwater are the same as those used in the HHRA for the phase 1 RI and RI addendum, and are described in detail in Section 4.4 of the phase 1 RI (Tetra Tech 2000).

C.3.1 IDENTIFICATION OF CHEMICALS OF POTENTIAL CONCERN

COPCs in surface water were identified using a 4-step screening process: removal of essential nutrients from the list of candidate COPCs, comparison to background, comparison to EPA ambient water quality criteria (AWQC), and comparison to EPA tap water PRGs. Three organic chemicals (dibromochloromethane, gamma-benzene hexachloride [gamma-BHC], heptachlor epoxide) and five inorganic chemicals (aluminum, arsenic, boron, thallium, and vanadium) were identified as COPCs in surface water at IRP Site 1.

C.3.2 EXPOSURE ASSESSMENT

The exposure assessment included the identification of potential receptors and exposure pathways, the estimation of COPC concentrations at the point of exposure, and the estimation of COPC doses to potential human receptors. Figure C-1 summarizes sources of chemicals at the IRP Site 1 landfill, chemical release and transport mechanisms that may result in release of chemicals from IRP Site 1 to the Mugu Lagoon, and the potential exposure pathways through which human receptors can come into contact with chemicals in surface water.

Based on the phase 1 RI exposure assessment (Tetra Tech 2000), recreational users and wildlife managers were identified as the primary potential human receptors. A wildlife manager was selected for evaluation in the HHRA because greater and more frequent contact with surface water is expected for this receptor. The wildlife manager was assumed to be exposed to COPCs in surface water by incidental ingestion, dermal contact, and inhalation of volatile COPCs released from surface water to air. However, only the ingestion and dermal routes of exposure were evaluated; the inhalation route of exposure was judged to be insignificant because of the infrequent detections and low concentrations of the volatile COPCs.

EPCs for surface water COPCs were based on maximum detected concentrations. Only the RME scenario was evaluated.

C.3.3 TOXICITY ASSESSMENT

A toxicity assessment provides information on the toxicity of COPCs, including dose-response values. The toxicity assessment for surface water COPCs is presented in Section 4.4 and Appendices L and O of the RI (Tetra Tech 2000).

C.3.4 RISK CHARACTERIZATION

This section summarizes the estimated human health risks associated with exposure to COPCs in surface water. Acceptable exposure levels to known or suspected carcinogens are generally concentration levels that represent a ELCR to an individual of between 10^{-4} to 10^{-6}. For noncarcinogens, an HI that exceeds 1.0 indicates the potential for health effects. COPCs with concentration levels that represent an ELCR greater than 10^{-4} or an HQ greater than 1.0, are considered COCs.

The ELCR estimated for the future wildlife manager exposure scenario was 9×10^{-5}. The ELCR is within the risk management range of 10^{-6} to 10^{-4} that EPA considers acceptable for industrial land use scenarios. The total noncancer HI estimated for this exposure scenario was 4, indicating the potential for noncancer health effects. Incidental ingestion of thallium in surface water contributed to the majority of the HI; the thallium HQ for this pathway was 2.9. HQs for other COPCs and for other exposure pathways were less than 1.0.

The risk assessment process is based on use of conservative assumptions that, when combined, are intended to overestimate the actual risk. An uncertainty analysis that was conducted for the surface water HHRA indicates that it was likely that the HQ for thallium was significantly overestimated and that the sitewide HI for surface water is unlikely to exceed the threshold HI of 1.0 (Tetra Tech 2004). This analysis is presented below.

Uncertainty Analysis for Thallium

The methodology and assumptions used to address uncertainties associated with the presence of COPCs across the site, COPC concentrations, and potential exposures to COPCs for a wildlife manager exposure scenario contribute to the likelihood that risks are over- or underestimated. The potential impact of these specific uncertainties on the noncancer HQ estimated for thallium was analyzed because the estimated HQ for thallium exceeds the threshold HQ of 1. None of the estimated cancer risks and noncancer HQs for exposure to the other surface water COPCs exceed acceptable levels.

To address uncertainties associated with the presence of COPCs across the site, it was assumed in the HHRA that the entire site is a single exposure point; risk and hazard estimates were based on the assumption that exposure to COPCs occurs uniformly across the site. However, an

analysis of the detection frequencies of the identified COPCs indicates that this assumption likely results in an overestimate of potential risks. The detection frequencies of the COPCs in surface water vary significantly, and in no instance are any of the COPCs detected in all site samples. The detection frequency for thallium was limited to nine out of forty samples. This detection frequency indicates that thallium is not persistent in surface water throughout NBVC Point Mugu. Therefore, the assumption that exposure to thallium occurs uniformly across the site is likely to result an overestimate of the HQ for thallium.

To address uncertainties associated with concentrations of COPCs, including thallium, maximum detected concentrations were used to represent EPCs for COPCs. This approach assumes that maximum detected concentrations of COPCs occur uniformly across the site and that exposures to COPCs are always based on maximum detected concentrations. This conservative approach is used because accurate characterization of chemical concentrations in surface water is difficult. Surface water chemical concentrations for COPCs are difficult to characterize because a large number of factors affect surface water quality on a day-to-day basis. These factors include, for example, the amount of surface water runoff, the quality of such runoff (for example, the presence of nonpoint source pollution), surrounding land use impacts (particularly, for example, agricultural use of pesticides), and point source pollution impacts. These factors produce large daily variations in surface water chemical concentrations, making it difficult to develop accurate statistical estimates of such concentrations. As discussed above, COPCs are not detected uniformly across the site; in some cases, COPCs are not detected in most locations of the site. In addition, COPC concentrations in surface water are subject to significant dilution effects from daily tidal influences. Therefore, use of maximum detected concentrations for EPCs is highly likely to result in an overestimate of potential cancer risks and noncancer hazards. Use of the arithmetic mean or the 95 percent upper confidence limit of the arithmetic mean (95UCL) as the EPC for COPCs may provide risk estimates that are more realistic, while still conservative.

An analysis was conducted to evaluate the effect of using more realistic concentration terms (that is, concentrations that are less than the maximum detected concentration) on the estimated noncancer HQ for thallium and the estimated sitewide HI. The noncancer HQ estimated for thallium using the maximum detected concentration was 2.9, based on the incidental surface water ingestion pathway. The total sitewide HI for all COPCs and pathways was 4. If arithmetic mean concentrations are used for EPCs, then the thallium HQ for this exposure pathway is reduced to 0.48, and the total sitewide HI for all COPCs is reduced from 4 to 0.8. If 95UCL concentrations are used for EPCs, then the thallium HQ for the incidental surface water ingestion exposure pathway is reduced to 0.84, and the total sitewide HI for all COPCs is 1. This analysis demonstrates that noncancer effects from exposure to thallium and other COPCs at the site are unlikely if EPCs are based on more realistic concentrations.

Lastly, the exposure assumptions used to estimate chemical intake for the wildlife manager receptor are also likely result to result in an overestimate of the HQ for thallium. Although wildlife managers currently work daily in the NBVC Point Mugu area, there is no quantitative information regarding the number of days per year each manager spends on the site or how often a manager is likely to contact surface water. The actual rate of chemical absorption from water also is difficult to quantify, particularly for short-duration exposures that may occur, for example, when a wildlife manager briefly places his or her hand in the water to retrieve an

object. To account for these uncertainties, conservative exposure assumptions were used to evaluate this exposure scenario. For example, it was conservatively assumed that both incidental ingestion of and dermal contact with surface water occur for eight hours per workday for 125 workdays per year and 25 years. The incidental surface water ingestion rate used in the HHRA is based on a swimming scenario; that is, the rate represents the amount of water that a swimmer, rather than a wildlife manager, would incidentally ingest. The dermal contact rate used in the HHRA assumes that the hands, face, forearms, and lower legs are available for exposure. These assumptions are very likely to overestimate the actual exposure and potential risks for a wildlife manager; this potential receptor population is unlikely to frequent the site or have this level of continual contact with surface water while at the site.

This analysis of the methods used address the uncertainties associated with the presence of COPCs across the site, COPC concentrations, and potential exposures to COPCs for a wildlife manager shows that the conservative assumptions used to address these uncertainties very likely resulted in an significant overestimate of actual risk. The actual sitewide HI is unlikely to exceed the threshold HI of 1.

C.4 HUMAN HEALTH RISK ASSESSMENT CONCLUSIONS

The ELCR associated with concentrations of COPCs in soil at IRP Site 1 are within the risk management range that EPA considers acceptable for industrial land use. Likewise, concentrations of COPCs in soil do not result in an HI greater than 1.0. Because IRP Site 1 is a landfill and future use of the site requires maintenance of a containment system for the landfill, it was not necessary to estimate potential risk for a residential exposure scenario (EPA 1993). However, implementation of institutional controls that restrict future land use activities at the site is required.

The ELCR for exposure to COPCs in surface water at IRP Site 1 is within the 10^{-4} and 10^{-6} risk management range that EPA considers acceptable for industrial land use scenarios. The HI is 4 and is attributable primarily to concentrations of thallium; however, results of an uncertainty analysis conducted for the surface water HHRA indicates that it is likely that the noncancer hazard associated with thallium was overestimated, and that the HI for surface water is unlikely to exceed the threshold HI of 1.0.

C.5 REFERENCES

Tetra Tech EM Inc. (Tetra Tech). 2000. "Phase I Remedial Investigation, Technical Memorandum, Naval Air Weapons Station, Point Mugu, California. Final." Prepared for Department of the Navy, Naval Facilities Engineering Command, Southwest Division, San Diego, California. March.

Tetra Tech. 2001 "Remedial Investigation/Feasibility Study Addendum for IRP Sites 1 and 6, Naval Air Station, Point Mugu Site, California. Final." Prepared for Department of the Navy, Southwest Division, San Diego, California. January.

Tetra Tech. 2004. "Remedial Investigation for Groundwater , Naval Base Ventura County, Point Mugu Site, California." Prepared for Department of the Navy, Southwest Division, San Diego, California. January.

U.S. Environmental Protection Agency (EPA). 1993. *Presumptive Remedy Guidance for CERCLA Municipal Landfill Sites*. EPA 540-F-93-035. Office of Solid Waste and Emergency Response. Washington, DC. September.

EPA. 2000. Smucker, Stanford J., Ph.D. "Region 9 PRGs Table 2000 Update." Online address: http://www.epa.gov/region09/waste/sfund/prg/whatsnew.htm

APPENDIX D
ECOLOGICAL RISK ASSESSMENT SUMMARY

APPENDIX D
CONTENTS

D.1 INTRODUCTION 1
D.2 SUMMARY OF SITE 1 ECOLOGICAL RISK ASSESSMENTS 1
D.3 FINAL PHASE I REMEDIAL INVESTIGATION TECHNICAL MEMORANDUM 4
D.3.1 Scoping Risk Assessment 4
D.3.1.1 Identification of Communities and Habitats 4
D.3.1.2 Potential Ecological Receptors 5
D.3.1.3 Evaluation of Exposure Pathways 5
D.3.1.4 Identification of Chemicals of Potential Ecological Concern 5
D.3.2 Results and Conclusions of the Scoping Risk Assessment 6
D.3.2.1 Results 6
D.3.2.2 Conclusions 7
D.4 REMEDIAL INVESTIGATION FOR GROUNDWATER 7
D.4.1 Ecological Risk Assessment Methodology 7
D.4.1.1 Problem Formulation 7
D.4.1.2 Exposure Assessment 8
D.4.1.3 Ecological Effects Assessment 9
D.4.1.4 Risk Characterization 10
D.4.2 Conclusions of the Ecological Risk Assessment 11
D.5 RISK TO VERTEBRATES TECHNICAL MEMORANDUM 12
D.5.1 Screening-Level Ecological Risk Assessment 12
D.5.2 Results and Conclusions of the Ecological Risk Assessment 12
D.5.2.1 Results 13
D.5.2.2 Conclusions 14
D.6 DRAFT ECOLOGICAL RISK ASSESSMENT ADDENDUM 14
D.6.1 Baseline Ecological Risk Assessment Methodology 15
D.6.2 Risk To Ecological Receptors at IRP Site 11 16
D.6.3 Ecological Risk Assessment Conclusions 17
D.7 ECOLOGICAL RISK ASSESSMENT CONCLUSIONS 17
D.8 REFERENCES 18

APPENDIX D
FIGURES

D-1 Conceptual Site Exposure Model Ecological Risk Assessment..... D-3

APPENDIX D
ECOLOGICAL RISK ASSESSMENT SUMMARY

D.1 INTRODUCTION

Several investigations have been conducted at Site 1 of the Naval Base Ventura County (NBVC) Point Mugu Installation Restoration Program (IRP) to evaluate the nature and extent of chemical concentrations in various media, identify the potential for exposure to chemicals present in various media, and to assess the effects that may be associated with exposure. Ecological risk assessments (ERA) are conducted to characterize current and potential threats to the environment that may be posed by chemicals of concern at the sites being investigated, as required by the National Oil and Hazardous Substances Pollution Contingency Plan (Title 40 Code of Federal Regulations 300.430).

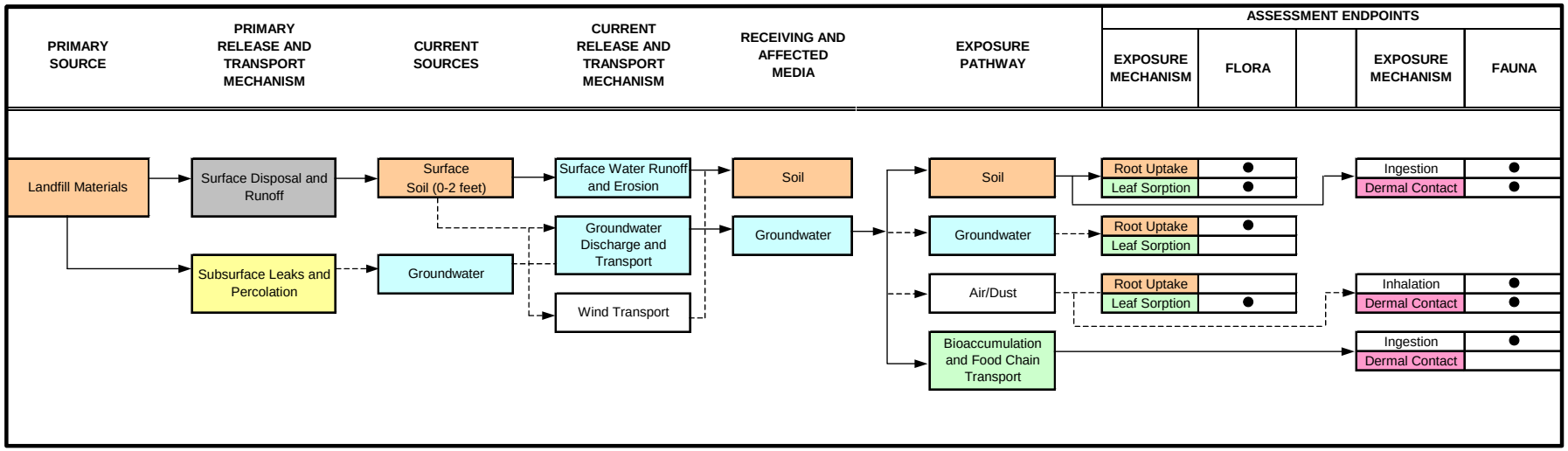
The objective of an ERA is to evaluate potential ecological risks associated with exposure to chemicals in potentially contaminated media under current site conditions and potential future land use scenarios. IRP Site 1 was used for lowland filling, dredge materials storage, and solid waste landfilling and burning operations from its development in 1952 until it was closed in 1975. Three disposal or potential source areas exist for IRP Site 1; the Solid Waste Fill Area, the Northern Burn and Fill Area, and the Southern Burn and Fill Area.

This appendix presents the results and conclusions of ERAs conducted at IRP Site 1. Section D.1 presents a summary of the activities and results of ERAs conducted at IRP Site 1. Sections D.2 through D.6 present a detailed description of the ERAs discussed in the phase 1 remedial investigation (RI) technical memorandum (Tetra Tech EM Inc. [Tetra Tech] 2000), the RI for groundwater (Tetra Tech 2004), the risk to vertebrates technical memorandum (Tetra Tech 2001), and the draft ecological risk assessment addendum (Tetra Tech 2003). Section D.7 presents the overall conclusions of ERAs conducted at the site, and references cited throughout this appendix are listed in Section D.8. Figure D-1 illustrates the conceptual site exposure model.

D.2 SUMMARY OF SITE 1 ECOLOGICAL RISK ASSESSMENTS

IRP Site 1 consists of both upland and marsh areas. The majority of the site is relatively flat, although portions of the surface of the landfill are mounded as a result of piles of soil and subsurface metal and construction debris. Portions of the upland areas at IRP Site 1 consist of unvegetated roadways, the landfill, and the laydown area resulting from a removal action and landfill capping conducted in 1997 (Tetra Tech 2004); however, approximately 18 acres of viable upland habitat exists at the site. Therefore, both soil (in the upland area) and sediment (in the marsh areas) present a complete exposure pathway for ecological receptors at IRP Site 1; these pathways were investigated in the final Phase 1 RI technical memorandum (Tetra Tech 2000), the RI for groundwater (Tetra Tech 2004), and the risk to vertebrates technical memorandum (Tetra Tech 2001). Groundwater and surface water are also potential transport pathways; these pathways were evaluated in the RI for groundwater (Tetra Tech 2004) and risk assessment addendum (Tetra Tech 2003). The following three sections describe the ecological

work conducted to date at IRP Site 1 in the evaluation of potential ecological risk to receptors present at the site.



LEGEND

IRP Installation Restoration Program

→ Major pathway

--→ Minor pathway

● Potentially complete exposure pathway

Tetra Tech EM Inc.

NBVC POINT MUGU, CALIFORNIA
U.S. Navy Southwest Division, NAVFAC, San Diego

FIGURE D-1
CONCEPTUAL SITE EXPOSURE MODEL
ECOLOGICAL RISK ASSESSMENT

Revised FS IRP Site 1
DS.A007.10571

2004-02-05 R:\Navy\Point Mugu\cto-368\ FIG D-1.dwg TtEMI-SA deborah.ford

D.3 FINAL PHASE I REMEDIAL INVESTIGATION TECHNICAL MEMORANDUM

The final phase 1 RI technical memorandum (Tetra Tech 2000) evaluated the nature and extent of chemicals in soils, sediments, groundwater, and surface water and the potential for ecological and human health risks at eight IRP sites, including IRP Site 1. A scoping risk assessment was conducted at IRP Site 1 (Tetra Tech 2000), and is described in more detail in the next section.

D.3.1 SCOPING RISK ASSESSMENT

The scoping assessment involves four components: (1) identification of communities and habitats, (2) the identification of potential ecological receptors, (3) the presence of potentially complete exposure pathways, and (4) identification of chemicals of potential ecological concern (COPEC).

D.3.1.1 Identification of Communities and Habitats

To identify communities and habitats present at IRP Site 1, a biological characterization was conducted, utilizing data collected during vegetation, benthic epifauna, fish, and mammal surveys (Tetra Tech 2000). The biological characterization identifies the plant and animal life present at the site, and is critical in the selection of receptors and assessment endpoints to evaluate potential exposure at the site.

Habitats at IRP Site 1 include non-native grassland and scrub on the surface surrounding the laydown area. Although much of the area consists of unvegetated roadways and the laydown area, parts of IRP Site 1 are vegetated, providing limited habitat for small mammals and birds. The area directly east of the landfill is characterized by intertidal mudflat and low salt marsh. These areas are subject to tidal movement and flow from Calleguas Creek, and are more contiguous with and representative of Mugu Lagoon; therefore, this area was assessed as part of IRP Site 11.

During the biological characterization, thirteen different plant species were identified at IRP Site 1. Iceplant (*Carpobrotus spp.*) and saltbush (*Atriplex watsonii*) were the dominant species in the upland areas, with cover values of 54.4 percent and 18.4 percent. Vegetation in lower marsh areas consisted of pickleweed (*Salicornia spp.*) and two species of green algae, *Enteromorpha clathrata* and *Ulva lactuca* or sea lettuce.

Mammals were surveyed in upland areas of IRP Site 1, where loose sandy soil, iceplant, grasses, and small trees and shrubs were dominant. Survey methods included live trapping, direct observation, and identification of scat and tracks. IRP Site 1 supports an extensive small mammal population, as the site is not subject to frequent base activities. Small mammals trapped on the site included California ground squirrels (*Spermophilus beecheyi*), western harvest mice (*Reithrodontmoys megalotis*), black rats (*Rattus rattus*), house mice (*Mus musculus*), California voles (*Microtus californicus*), and dusky-footed woodrats (*Neotoma fuscipes*). In addition, scat, tracks, and other visual evidence indicated the presence of raccoons (*Procyon lotor*), coyotes (*Canis latrans*), red foxes (*Vulpes fulva*), opossums (*Didelphis marsupialis*), and blacktail jackrabbits (*Lepus californicus*).

D.3.1.2 Potential Ecological Receptors

Based on the biological characterization, ecological receptors are present at IRP Site 1 and were further evaluated in the scoping risk assessment. Pickleweed was selected as an assessment endpoint for plant populations because it is a native California species and because it has a critical ecological function in salt marshes. The dusky-footed woodrat was also selected as an assessment endpoint for small mammal populations, because it was directly observed at the site, is listed as a special status species in California, and has available toxicological data for a similar surrogate species. Although no formal surveys were conducted for birds, the Northern Harrier (*Circus cyaneus*) was also selected as an assessment endpoint due to the observed presence of raptors at NBVC Point Mugu.

D.3.1.3 Evaluation of Exposure Pathways

Exposure pathways, or the point of entry of a chemical into a receptor, include root uptake and leaf sorption for plants; and inhalation, dermal contact, and ingestion of contaminated soil, surface water, and food for animals. The conceptual site exposure model is shown in Figure D-1. In the phase 1 RI technical memorandum, the primary exposure pathway evaluated was ingestion of soil and food items. For example, the Northern Harrier is an upper-trophic-level receptor that may be exposed to chemical concentrations through ingestion of small mammals, birds, and small reptiles, as well as through incidental soil ingestion.

D.3.1.4 Identification of Chemicals of Potential Ecological Concern

Due to the presence of a complete exposure pathway, COPECs were identified in upland soils. In soil, COPECs at IRP Site 1 were identified using a 3-tiered method (Tetra Tech 2000). First, chemical concentrations were compared with literature benchmarks, such as United States (Shacklette and Boerngen 1994) and Canadian (Ministry of the Environment of British Columbia 1989) background soil criteria and ecological effects criteria. Second, chemicals were evaluated based on their frequency of detection. If the maximum chemical concentration for a particular chemical exceeded the literature benchmark values and had a frequency of detection greater than 5 percent, the chemical was identified as a COPEC. Finally, essential nutrients for ecological receptors, such as calcium, potassium, iron, magnesium, and sodium, were eliminated from the COPEC selection process.

Because groundwater at IRP Site 1 has the potential to mix with adjacent surface water, thereby forming a complete exposure pathway, COPECs were also identified for groundwater. To identify COPECs in groundwater at IRP Site 1, the maximum chemical concentrations in groundwater at the site were compared with chronic ambient water quality criteria (AWQC). In general, the chronic AWQC for saltwater life protection (U.S. Environmental Protection Agency [EPA] 1999a) was used; however, if no chronic value was available, the acute AWQC was used instead. If the maximum chemical concentration in groundwater exceeded the respective AWQC for a particular chemical, that chemical was identified as a COPEC.

Several inorganic chemicals were identified as soil COPECs at IRP Site 1. Of these, copper and lead concentrations were an order of magnitude higher than the U.S. and Canadian background levels. Organic soil COPECs identified at IRP Site 1 included fluoranthene, pyrene, polychlorinated biphenyls (PCB), dichlorodiphenyltrichloroethane (DDT) isomers, and dieldrin. COPECs identified for groundwater at IRP Site 1 included copper, mercury, nickel, PCBs, and phosphorus.

D.3.2 RESULTS AND CONCLUSIONS OF THE SCOPING RISK ASSESSMENT

Concentrations of copper and lead were an order of magnitude higher than the Canadian background soil criteria. When considering potential ecological effects of these two metals, copper is not a significant toxin in terrestrial environments and does not biomagnify; therefore, risk to upper-trophic-level ecological receptors is limited. Lead, however, is very toxic and, if bioavailable in soils, could inhibit reproduction and development of terrestrial organisms; therefore, lead was further evaluated.

D.3.2.1 Results

Lead was present in all 12 soil samples collected at the site, with a maximum concentration of 595 milligrams per kilogram (mg/kg). The average concentration was 18.7 mg/kg, indicating that exposure of ecological receptors to lead may be limited to specific isolated areas of the site where the maximum concentrations occur. Lead concentrations exceeding 100 mg/kg were found in samples collected within or directly adjacent to the larger of the two open and burn fill areas, with additional elevated concentrations in the smaller open burn fill area, and the maximum lead concentration in a subsurface soil sample in a highly disturbed area near the laydown area; ecological receptors will therefore not likely be exposed to these elevated lead concentrations. In addition, lead tends to sorb strongly to organic matter in soil, thereby reducing bioavailability and mitigating its potential for migration in soils.

Although concentrations of polynuclear aromatic hydrocarbons (PAH) in soil exceeded the Canadian background criterion of 0.1 mg/kg, the frequency of detection for these chemicals were low (detected in only 2 of 12 samples) and were limited to the burn and fill areas on the surface of the landfill. Because the Southern Burn and Fill Area is currently covered with a chip-seal cap, which eliminates exposure of ecological receptors to chemicals and renders that exposure pathway incomplete, the phase 1 RI technical memorandum concluded that PAHs do not pose a substantial risk to ecological receptors at IRP Site 1 (Tetra Tech 2000). In addition, none of the PAH concentrations exceeded effects range-low (ER-L) concentrations, a benchmark used to evaluate potential effects associated with submerged sediments (Long and others 1995), indicating that IRP Site 1 is not a source of PAHs to Mugu Lagoon.

Several classes of pesticides and PCB mixtures were detected in IRP Site 1 soil, but generally at levels below background criteria. DDT, dichlorodiphenyldichloroethane (DDD), dichloro-diphenyldichloroethene (DDE), chlordane, and dieldrin were detected at IRP Site 1, but at very low concentration levels. PCBs were detected at concentrations only slightly exceeding the Canadian background criterion and did not appear to be widespread (Tetra Tech 2000).

COPECs identified for groundwater at IRP Site 1 included copper, mercury, nickel, PCBs, and phosphorus. Ecological receptors are not exposed to chemical concentrations in groundwater until groundwater reaches surface water. Although the potential ecological risk from exposure to groundwater was not assessed in the phase 1 RI technical memorandum, groundwater at IRP Site 1 does have the potential to mix with adjacent surface water, thereby forming a complete exposure pathway. Therefore, groundwater COPECs were evaluated as a part of the groundwater monitoring effort associated with IRP at Site 1.

D.3.2.2 Conclusions

Although there are potentially complete exposure pathways for ecological receptors, the phase 1 RI technical memorandum concluded that ecological exposure to chemicals present at IRP Site 1 is not expected to be significant (Tetra Tech 2000). This determination was based on the limited habitat value of IRP Site 1 and the limited areal distribution of chemical concentrations at the site. Lead was identified as the primary COPEC; however, lead concentrations were limited to small isolated areas and the high pH of site soils would limit the solubility and bioavailability of lead in soils, thereby reducing the potential lead exposure at IRP Site 1. Due to the potential for chemicals in groundwater to reach adjacent surface water bodies, the phase 1 RI technical memorandum recommended a groundwater assessment to evaluate the attenuation of COPECs; this evaluation was performed as a part of the groundwater monitoring performed in the IRP at Site 1 and is presented in the RI for groundwater (see Section D.4).

D.4 REMEDIAL INVESTIGATION FOR GROUNDWATER

The RI for groundwater (Tetra Tech 2004) evaluated the nature and extent of chemicals in soil, sediment, groundwater, and surface water and their potential ecological and human health risks at eight IRP Sites, including IRP Site 1. Groundwater samples from IRP Site 1 suggest that the site may be a contributor to elevated concentrations of arsenic, copper, lead, nickel, and silver in surface water because of the proximity of surface water to the site and the strong tidal influence in groundwater at the site.

D.4.1 ECOLOGICAL RISK ASSESSMENT METHODOLOGY

Due to the potential for groundwater to mix with surface water, a screening-level ecological risk assessment was conducted at NBVC Point Mugu as part of the RI for groundwater (Tetra Tech 2004). The overall approach to the ERA was based on guidance from EPA (1997, 1999b) and the California Department of Toxic Substances Control (DTSC) (Cal/EPA 1996). The ERA followed the basic framework approach outlined by EPA (1992b) and included: (1) problem formulation, (2) exposure assessment, (3) ecological effects assessment, and (4) risk characterization. COPECs were identified as part of the exposure assessment.

D.4.1.1 Problem Formulation

The problem formulation step identifies key factors in the risk assessment such as habitats, receptors, and complete exposure pathways. This step includes information about the site location and background; the environmental setting, including the habitats and species present; the conceptual site model, including potential stressors and chemical transport pathways; the evaluation of exposure pathways; and the selection of assessment and measurement endpoints.

Several habitats occur at NBVC Point Mugu, as designated by Keeney (1998), based on dominant plant species and physiognomy and the modified habitat type classification from Zedler, Nordby, and Kus (1992). In the RI for groundwater, a modified habitat classification scheme was used, where the primary habitats present at NBVC Point Mugu were tidal creeks, salt marsh, intertidal mudflats and sandflats, and upland areas. Ecological information for NBVC Point Mugu was obtained from the following sources: (1) benthic infauna, benthic epifauna, and fish surveys presented in the phase I RI technical memorandum (Tetra Tech 2000); and (2) descriptions of invertebrate and fish communities (Onuf 1987). Risk to aquatic receptors from ingestion of contaminated surface water was the primary exposure pathway evaluated in the RI for groundwater. At IRP Site 1, the risk associated with exposure to chemicals in soil was also evaluated.

D.4.1.2 Exposure Assessment

The primary exposure media evaluated at IRP Site 1 was soil; groundwater, however, was also assessed to determine the potential risks to ecological receptors from chemical migration from IRP Site 1 into surface water in Mugu Lagoon based on the fate and transport model. In soil, COPECs at IRP Site 1 were identified using the 2-tiered method described in the phase 1 RI technical memorandum (Tetra Tech 2000). To identify COPECs for ecological receptors in surface water and groundwater at IRP Site 1, chemical concentrations at the site were compared with AWQC in the following order:

- State of California chronic AWQC for saltwater aquatic life protection (EPA 2000) were used when available.
- If a State of California AWQC was not available, the chronic National AWQC for saltwater life protection (EPA 1999a) was used.
- If neither a State of California nor a national chronic AWQC was available, then one-tenth of the State of California acute AWQC (EPA 2000) was used. The factor of one-tenth was derived from DTSC guidance for ecological risk (Cal/EPA 1996).

AWQC for the protection of saltwater aquatic life were developed to apply to saline surface water bodies and are intended to protect marine aquatic life from pollutants in surface water (EPA 1999a, 2000). AWQC were therefore considered appropriate screening values for both groundwater and surface water because of the potential for affected groundwater to migrate to ecological receptors in surface water at NBVC Point Mugu. Consideration of the requirements described in the *California Ocean Plan* (California Environmental Protection Agency [Cal/EPA] 1997) was also evaluated, because these requirements are potential benchmarks for identifying COPCs and COPECs. Comparison of the water quality objectives presented in Table B of the *California Ocean Plan* for the protection of marine aquatic life and AWQC indicated that the AWQC are generally less than or similar to the instantaneous maximum and daily maximum limiting concentration, with few exceptions. Because AWQC are lower than the water quality objectives specified in the *California Ocean Plan*, the use of AWQC in the RI for groundwater in the chemical screening process is considered to be protective of marine aquatic life.

In cases where AWQC were not available, secondary reference criteria were drawn from published literature or from criteria established in other EPA regions, including the following:

- "Preliminary Remediation Goals for Ecological Endpoints" (Efroymson 1997a)
- Lowest observed adverse effects levels in ecological receptors (Marschak 2000) Tier II EPA Office of Solid Waste and Emergency Response (OSWER) threshold values for freshwater aquatic life, calculated using the Great Lakes Water Quality Initiative Tier II Methodology (EPA 1996)
- EPA Region IV Water Management Division, Water Quality Standards Unit's Screening List for Freshwater Surface Water (EPA 1995)

In addition to the screening criteria above, metals in surface water were qualitatively compared to baseline values established at NBVC Point Mugu to further evaluate metal COPECs. Maximum, minimum, and mean concentrations of metals in 19 upstream surface water stations located in areas unaffected by base activities were used to establish baseline values for metals. Six of these locations were sampled during the RI for groundwater; the other 14 locations were sampled during the phase I RI technical memorandum (Tetra Tech 2000). The maximum, minimum, and mean concentrations of metals in samples collected at these locations were used to evaluate whether metals in surface water in downgradient areas of the base represent off- or on-base source areas.

Inorganic and organic chemicals identified as COPECs that were detected in multiple surface water samples at concentrations greater than AWQC and baseline values include arsenic, copper, lead, nickel, silver, DDT, gamma-chlordane, gamma-benzene hexachloride (BHC), heptachlor, and heptachlor epoxide. Only trichloroethene (TCE) was identified as a COPEC in groundwater.

To evaluate hydraulic interactions at IRP Site 1, a fate and transport model was used to simulate groundwater flow and to help understand the effects of potential discharge of contaminated groundwater to surface water bodies. Inputs to the model are presented in Table 6-4 of the RI for groundwater (Tetra Tech 2004).

D.4.1.3 Ecological Effects Assessment

The presence of metals and metalloids requires that exposure to lower-level receptors, such as benthic invertebrates, be evaluated. Based on the work of Onuf (1987), MacDonald (1976), and Zedler (1987), populations of fish (California halibut, California killifish, and shovelnose guitarfish) and benthic invertebrates were selected as assessment endpoints. Fish and epifaunal and infaunal receptors may be exposed to chemicals in both surface water and groundwater that is released as surface water.

The RI for groundwater presents a detailed discussion on the potential toxicological effects (published in literature) from exposure to the COPECs most likely to be contributing to potential ecological risk at NBVC Point Mugu. In general, chemical concentrations were below literature effects levels, with the exception of copper, nickel, and gamma-chlordane.

D.4.1.4 Risk Characterization

Preliminary evaluation of soil concentrations at IRP Site 1 indicated that concentrations of chemicals in soil are not likely to be of concern to vertebrate receptors, and are not likely to be contributing to concentrations of metals in surface water. Current conditions at the site eliminate or greatly reduce the exposure of vertebrate receptors to soil. In addition, IRP Site 1 is not likely to provide substantial habitat because of the continued presence of the chip seal and soil cover that reduces exposure to soil.

Site-specific analytical data, selection of COPECs, and toxicological literature information were used to make conclusions regarding potential risk to ecological receptors from groundwater and surface water. Metals identified as COPECs in groundwater at IRP Site 1 are arsenic, cobalt, copper, nickel, and zinc, because they currently exceed AWQC in semi-perched aquifer groundwater at the sediment-water interface. However, concentrations of these metals were generally below literature effects levels and were sporadically detected. Tidal mixing, as well as variations in total dissolved solids values, may contribute to inconsistent metals concentrations in samples throughout IRP Site 11 (Mugu Lagoon). Results of the fate and transport model show that TCE levels in groundwater are predicted to appear in surface water at levels ranging from 0.023 to 1,600 micrograms per liter (µg/L); the ERA for surface water, however, did not identify TCE as a COPEC. This may be a result of rapid dilution of groundwater chemicals in the surface water within a very short distance of the sediment-surface water interface.

Based on the risk characterization presented in the screening-level ERA (Tetra Tech 2004), it is unlikely that metals and pesticides in surface water samples at NBVC Point Mugu are present for extended periods of time at levels likely to cause ecological risk. Based on upstream analysis of surface water samples collected, chemicals may be entering the lagoon from off-site activities, rather than on-base sources. The physicochemical factors of Mugu Lagoon, including pH, salinity, dissolved oxygen, hardness, temperature, are likely to reduce the bioavailability of chemicals at the site. For example, the presence of fine-grained sediments and the tidal action present at the site will increase the potential for metals to be bound to soil and sediment particles. In addition, higher salinities, such as those present at NBVC Point Mugu, also can decrease the bioavailability of metals. Finally, the neutral pH condition of surface water samples at NBVC Point Mugu suggests that adverse effects attributable to pH will be limited. The pH of surface water samples at NBVC Point Mugu ranges from 7.66 to 8.69, which is likely to decrease the bioavailability of metals to aquatic receptors.

The pesticides identified at levels greater than literature benchmarks were detected infrequently and, with the exception of gamma-chlordane (which was found in only 2 of 40 downstream samples), were present at higher concentrations in some upstream samples. The land use surrounding NBVC Point Mugu is highly agricultural, with many off-base sources of pesticides; storm events may wash these pesticides into Mugu Lagoon from other portions of the watershed. Ecological receptors would not likely be exposed to the maximum concentrations long enough for a chronic exposure because of the constant mixing of surface water. Pesticides are more likely to be bound to sediments; therefore, a risk to vertebrates technical memorandum" (Tetra Tech 2001) was developed to evaluate potential risk of concentrations in soil and sediments to higher-level ecological receptors, such as birds and mammals, through food chain models.

D.4.2 CONCLUSIONS OF THE ECOLOGICAL RISK ASSESSMENT

Because surface water concentrations at IRP Site 1 exceeded the AWQC, a preliminary screening to identify COPECs in soil at the site was conducted. Results presented in the RI for groundwater indicated little to no risk to ecological receptors from chemical concentrations in soils at IRP Site 1 (Tetra Tech 2004). Because of the presence of special status species, however, it was recommended that sediments and soils be further evaluated to determine potential ecological risk to higher-level receptors such as birds and mammals. Results of food chain modeling are presented in the risk to vertebrates technical memorandum (Tetra Tech 2001).

Arsenic, cobalt, copper, lead, nickel, silver, and zinc were detected at levels exceeding AWQC values in groundwater samples at IRP Site 1 and were therefore further evaluated. These chemicals were evaluated in the fate and transport model to estimate concentrations at the point of exposure to ecological receptors, and to determine whether they may pose a present or future risk to ecological receptors exposed to surface water. With the exception of lead, the fate and transport model for IRP Site 1 could not be used to simulate the migration of metal COPCs, because the frequency of detections for these metals was not sufficient to determine model source dimensions. The migration period for lead to reach surface water was estimated to be 5,400 years; therefore, lead was not considered to pose a threat to ecological receptors exposed to surface water. In addition, the identification of IRP Site 1 as a primary source area for metals in groundwater is also problematic because of the difficulty in identifying background levels in both area groundwater and surface water.

No trends in groundwater chemistry could be established that attribute metal COPECs in surface water to IRP Site 1, and therefore the fate and transport assessment cannot be used to resolve groundwater issues at IRP Site 1. However, concentrations of metals at IRP Site 1 were compared to literature effects levels to further evaluate potential risk to ecological receptors. In general, chemical concentrations were less than literature effects levels. Site-specific physical and chemical data, such as pH and salinity, were evaluated, as well as factors affecting bioavailabililty. The pH and salinity conditions present at NBVC Point Mugu indicate that the bioavailability of metals will be reduced through time.

Validation surveys or further ecological analysis of surface water were not recommended to delineate and confirm the risk to marine communities introduced by contaminated surface water. Given the complex hydrology of Mugu Lagoon and its watershed, and the presence of potential sources of metals within the installation and in the overall watershed, attribution of risk to these sources would be difficult. Attribution likely would require an extensive sampling program to define ambient conditions in groundwater and surface water, both upstream and on the base. This type of program would be difficult, considering the highly variable tidal currents and salinity, lithology and tidal influence variability in groundwater, and the multitude of upstream contributions. Source areas identified on base currently are being evaluated in the feasibility study for remediation alternatives. With the remediation of these potential source areas, the potential for future exposure to ecological receptors at IRP Site 11 will be reduced even further.

D.5 RISK TO VERTEBRATES TECHNICAL MEMORANDUM

Due to the potential threat to vertebrate receptors posed by chemicals present at NBVC Point Mugu, the Navy, through its internal review process, decided to complete additional work on the ERA for IRP Sites 1 (Landfill), 5 (Old 6 Area Shops), and 11 (Mugu Lagoon and Drainage Ditches). This evaluation was presented as a screening-level ERA in the risk to vertebrates technical memorandum (Tetra Tech 2001). A screening-level ERA was conducted to evaluate whether unacceptable risk to vertebrate receptors is present at IRP Site 1, based on the results of food-chain modeling. Only the upland areas were evaluated in the screening-level ERA for IRP Site 1; the marsh areas directly east of the landfill (characterized by intertidal mudflat and low marsh) were evaluated in the risk assessment for IRP Site 11.

D.5.1 SCREENING-LEVEL ECOLOGICAL RISK ASSESSMENT

A screening-level ERA was conducted following Navy policy (Navy 1999), based on the EPA 8-step process for conducting ERAs (EPA 1992a, 1992b, 1997, 1999a) and was intended to support the phase 1 RI technical memorandum (Tetra Tech 2000). The screening-level ERA included a dose assessment to evaluate potential risk to vertebrates from COPECs as required by Navy guidance for completing ERAs (Navy 1999). The main objectives of the risk to vertebrates technical memorandum (Tetra Tech 2001) were to: (1) conduct a preliminary assessment of potential risk to vertebrate receptors, such as mammals and birds; (2) implement the Navy guidance for conducting ERAs; and (3) further categorize sites that were identified in the phase 1 RI technical memorandum (Tetra Tech 2000). These objectives were accomplished by evaluating site exposure doses for receptors using a food-chain analysis and calculating hazard quotients (HQ) by comparing these doses to toxicity reference values (TRV) in accordance with Navy guidance (Navy 1997, 1999). Sites presented potential risk were categorized in one of two ways: sites that present acceptable risk and sites that present unacceptable risk. The level of risk was determined by evaluating HQs according to guidance (EPA 1989). If unacceptable risk was identified for an IRP Site or habitat area, further investigation was recommended; this recommendation was also made if a high level of uncertainty was associated with the evaluation of potential risk.

D.5.2 RESULTS AND CONCLUSIONS OF THE ECOLOGICAL RISK ASSESSMENT

Exposure of representative vertebrate receptors to COPECs at NBVC Point Mugu was evaluated using the following:

- Food-chain modeling to estimate doses to representative receptors
- Comparison of estimated doses with TRVs
- Qualitative evaluation of chemicals for which no TRVs are available
- Literature reviews to support model assumptions and to identify potential effects

Two vertebrate species representing various feeding guilds were evaluated using the food-chain model at IRP Site 1:

- Deer mouse (*Peromyscus maniculatus*); omnivorous small mammal
- American kestrel (Falco sparverius); omnivorous bird

These species were selected based on various decision criteria, including: (1) observation of species at NBVC Point Mugu; (2) susceptibility of receptor to chemical effects; and (3) potential for exposure based on feeding behavior and site use. Other decision criteria are discussed in the phase 1 RI technical memorandum (Tetra Tech 2000). The methods used to assess risk to these vertebrate species are described in more detail in the risk to vertebrates technical memorandum (Tetra Tech 2001).

D.5.2.1 Results

Dose calculations and HQs using the conservative screening-level assumptions that exceed 1.0 for the deer mouse and American kestrel for IRP Site 1 upland soils are presented in the following table:

COPEC	HQ (Maximum Dose[a]/High TRV)	HQ (Maximum Dose[a]/Low TRV)
Deer Mouse		
Cadmium	0.21	9.42
Copper	0.04	9.02
Lead	0.02	3,265
Manganese	0.09	988
Nickel	0.02	4.30
American Kestrel		
Lead	0.09	36.5

HQs calculated using the high TRV for all COPECs for both the deer mouse and American kestrel were below 1.0, indicating no significant or immediate risk. HQs calculated using the low TRV for cadmium, copper, lead, manganese, and nickel exceed 1.0, and therefore indicate potential risk to the deer mouse. For the American kestrel, only the HQ calculated using the low TRV for lead exceeded 1.0, indicating potential risk from this chemical.

For the deer mouse, HQs for lead and manganese are particularly elevated. However, the areal extent of certain chemicals appears to be limited. For example, the highest lead and manganese concentrations in IRP Site 1 occur at sampling locations MW1-5R, B1-3, B1-4, and B1-6; these samples are associated with the Northern and Southern Burn and Fill Areas. The Southern Burn and Fill Area is currently covered with a chip-seal cap (Tetra Tech 2000), precluding exposure of ecological receptors to chemicals since no complete exposure pathway exists. In addition, it is unlikely that concentrations of these metals are 100 percent bioavailable to receptors at NBVC

Point Mugu, since metals present in soil are likely to be (1) bound, adsorbed, and complexed with inorganic and organic ligands or (2) present as precipitates, rendering them less bioavailable. The homogeneous high pH (7.4 to 9.1) of the soils at IRP Site 1 will tend to adsorb and precipitate lead, likely in the form of lead carbonate, rendering it less soluble and less bioavailable.

The assumption of 100 percent bioavailability likely overestimates the potential risk from lead concentrations to the American kestrel. In addition, assumptions made in the food-chain model are conservative, and therefore may result in an overestimate of risk for the kestrel. For example, a site use factor of 1.0 was assumed for the American kestrel, suggesting that the receptor inhabits the area 100 percent of the time. However, the average breeding home range of adult male and female American Kestrels in Sierra, California, was measured as 270 acres by Balgooyen (1976). The distance adult females foraged from the nest in Yolo, California, ranged from 500 to 3,500 meters (Rudolph 1982, as cited in California Environmental Protection Agency [Cal/EPA] 2001). Therefore, it is unlikely that the American kestrel would feed exclusively in IRP Site 1, which is approximately 24.8 acres. Thus, the American kestrel would not be exposed to concentrations at the site 100 percent of the time, and potential risk would be less than is indicated by the food-chain model.

D.5.2.2 Conclusions

Ecological risks from IRP Site 1 soils appear low, and exposure pathways in the upland habitat area will likely remain incomplete due to the presence of the landfill cap and paved areas (approximately 7 of the 24.8 acres present). The highest chemical concentrations are generally located in paved areas; therefore, no complete exposure pathways exist for the locations with the highest chemical concentrations. Concentrations in the vegetated upland areas are considerably lower than those in the paved areas. Concentrations of several metals exceeded toxicity benchmarks; however, due to the physicochemical characteristics of the soils present at IRP Site 1, such as high pH, metals are likely to be present in less bioavailable forms. Food-chain models indicate that the deer mouse and the American kestrel are not at an immediate or significant risk from any COPEC modeled in IRP Site 1; in addition, assumptions used in the food-chain model are conservative and may overestimate actual field exposures. The deer mouse may be at potential risk from maximum concentrations of lead and manganese; however, due to (1) the limited areal extent of these chemicals, with the highest chemical concentrations located under paved areas, and (2) the high pH of the soils, ecological exposure to these metals is not expected to be significant at IRP Site 1.

The results of the screening-level ERA for IRP Site 1 indicate the site does not pose unacceptable risk to ecological receptors. Based on the screening-level ERA for IRP Site 1, no action is recommended based on the ecological risk to vertebrate receptors in the upland areas.

D.6 DRAFT ECOLOGICAL RISK ASSESSMENT ADDENDUM

The ecological risk assessment addendum for IRP Sites 5 and 11 at NBVC Point Mugu Site was completed to support the previous investigations presented in the final phase I RI technical memorandum (Tetra Tech 2000) and RI for groundwater (Tetra Tech 2004). IRP Site 11 is the Mugu Lagoon which potentially receives surface and groundwater inputs from IRP Site 1. The

results of the screening-level ecological risk assessment were presented in the risk to vertebrates technical memorandum (Tetra Tech 2001) and indicated some potential risk to avian vertebrates from selected metals and organic chemicals in IRP Sites 5 and 11. Plant and invertebrate receptors were not considered at risk based on the screening-level risk assessment; however risk to plant and invertebrate receptors was further evaluated in this baseline ecological risk assessment (BERA). The goals of this BERA were to: (1) conduct a more focused assessment of potential risk to avian receptors identified as being at potential risk at these sites, (2) summarize risk to plant and invertebrate receptors based on previous studies, and (3) provide information for risk management decisions at IRP Sites 5 and 11.

EPA and Navy guidance for risk assessments (EPA 1992b, 1992c, 1997, 1999a; Navy 1999) were used in developing an approach for evaluating ecological risk at Point Mugu. EPA guidance for ERAs under the Comprehensive Environmental Response, Compensation, and Liability Act (EPA 1997, 1999) provides the framework for the ERA.

D.6.1 BASELINE ECOLOGICAL RISK ASSESSMENT METHODOLOGY

To assess potential risk to ecological receptors, several types of data were evaluated including (1) chemistry data for sediment and tissue to evaluate the nature and extent of chemicals present; (2) bioassays using amphipods and polychaetes to directly evaluate the potential toxicity of chemical stressors; (3) bioaccumulation tests using bivalves, crustaceans, invertebrates, and plants exposed to site sediments to evaluate the potential for trophic transfer of chemicals; (4) measurement of simultaneously extractable metals, which aids in estimating the bioavailability of chemical stressors; (5) food-chain modeling to identify the potential effects of site-specific ingested doses of chemicals to higher-level receptors; and (6) statistical data analyses to evaluate trends in biological and chemical results to quantitatively interpret the significance of correlations between biological, physicochemical, and chemical data.

Additional focused sampling of sediment and tissue was conducted from May to June 2002 at IRP Sites 5 and 11 to provide site-specific data for the BERA. A habitat approach was used that was based on distinct habitat areas present at IRP Sites 5 and 11: salt marsh, mudflat, and tidal creek. The new data from 2002 also included collection of sediment samples from similar habitats in the East and West Reference Areas that were identified as appropriate areas for making comparisons of site versus reference chemical concentrations. The East and West Reference Areas are within NBVC Point Mugu, and were originally identified by the Navy and the regulatory agencies as areas within Mugu Lagoon that had the least impacts from IRP sites. These reference areas were used in the phase 1 RI report (Tetra Tech 2000) for comparison and screening purposes and have been used in the same manner in this document.

The initial evaluation for the BERA included a comparison of the 2002 chemical data to sediment toxicity guidance values (specifically, Oak Ridge National Laboratory benchmarks [Sample 1996 and Efroymson 1997b], preliminary remediation goals (PRG), effects-range low, and effects-range median (ER-M) values). This initial evaluation resulted in a list of COPECs for each receptor group by habitat area. COPECs for IRP Site 11 included arsenic, chromium, lead, manganese, molybdenum, nickel, selenium, silver, zinc, DDT congeners, and Aroclors.

Food-chain modeling was used to identify COPECs that may pose the greatest risk to representative avian receptors. HQs were calculated to evaluate the risks to representative species of birds at the site by comparing estimated ingested doses with TRVs. Those chemicals that exceeded an HQ of 1.0 were then compared to the Reference Area sediment concentrations to evaluate whether significant differences between the concentrations exist.

A qualitative weight-of-evidence (WOE) approach was used, which combined various lines of evidence including analytical chemistry results, bioassays, bioaccumulation information, factors affecting chemical bioavailability, food-chain modeling, statistical analyses, and literature reviews. A set of decision criteria or threshold of concern was used to evaluate the significance of each line of evidence based on the magnitude of the observed response. The WOE factors used to evaluate significant risk at the population level were (1) the frequency and magnitude of concentrations exceeding threshold levels of concern for individual lines of evidence at each habitat; (2) the proportion of locations within individual habitats where risk thresholds were exceeded for one or more lines of evidence; and (3) a consideration of other factors, such as the relative strength of individual lines of evidence for indicating significant risk, that affect the interpretation of the combined results for all lines of evidence.

D.6.2 RISK TO ECOLOGICAL RECEPTORS AT IRP SITE 11

Based on the lines of evidence, there is potential risk to plants from metals at IRP Site 11; however, only chromium had concentrations significantly greater than the benchmark. Based on the bioaccumulation factors (BAF) for plants, metals do not appear to be bioaccumulating at a significant rate; all BAFs were less than 1.0. Some DDTs and Aroclors may be accumulating in plant tissues at higher rates. The WOE does not indicate that chemicals at IRP Site 11 pose significant risk to populations of plants.

Results of the evaluation for risk to benthic invertebrates indicated that effects to populations of invertebrates are unlikely. Only DDTs had some concentrations exceeding the ER-M value, and bioassay results were significantly different from laboratory controls at only two locations. Although these results indicate that some limited locations may exhibit toxicity to invertebrates, toxic concentrations are not widespread, and populations of benthic invertebrates are not likely at risk.

Results of the evaluation for risk to vertebrates (birds) indicated that significant or immediate risk to the western snowy plover (*Charadrius alexandrinus nivosus*), may be present from chromium because the HQ is greater than 1.0 for both maximum and average doses. Chromium concentrations at IRP Site 11 were statistically greater than concentrations at the East Reference Area, and elevated concentrations were distributed throughout the site. The average concentrations of chromium in each of the habitats evaluated exceed the vertebrate PRG.

Maximum estimated doses of selenium pose significant or immediate risk to light-footed clapper rails and snowy plovers (HQ is greater than 1.0) and average doses showed significant or immediate risk to western snowy plovers (HQ also is greater than 1.0). However, selenium concentrations at the site were significantly less than the reference area concentrations, indicating that there are watershed sources of selenium that drive the risk at the site.

D.6.3 ECOLOGICAL RISK ASSESSMENT CONCLUSIONS

Chromium concentrations at IRP Site 11 were statistically greater than concentrations at the East Reference Area. Based on the results of the BERA for avian receptors for IRP Site 11, an FS is recommended. Elevated chromium concentrations are distributed throughout IRP Site 11 with the average concentrations in the salt marsh, mudflat, and tidal creek habitats exceeding the vertebrate PRG. The FS should include an evaluation of long-term monitoring because of the sensitive wetland habitat and special status species present at the site.

D.7 ECOLOGICAL RISK ASSESSMENT CONCLUSIONS

In summary, evaluations of soil concentrations at IRP Site 1 indicate that concentrations of chemicals in soil are not likely to be of concern to vertebrate receptors. The landfill cap at the site currently eliminates or greatly reduces the exposure of vertebrate receptors to soil. The site is not likely to provide substantial habitat due to the continued presence of a cap that reduces exposure to soil. Results of food-chain modeling indicate that soil concentrations do not pose risk to species of small herbivorous mammals (deer mouse) and omnivorous birds (American Kestrel).

In addition, concentrations in soil are not likely to be contributing to concentrations of metals in surface water. No unacceptable risk to ecological receptors was identified for surface water. Although concentrations in groundwater are elevated, these concentrations will not reach surface water at concentrations considered harmful to ecological receptors. No trends in groundwater chemistry could be established that attribute metal COPECs in surface water to IRP Site 1 . Further evaluation of certain COPECs in the ERA for surface water did not indicate a risk to ecological receptors because of rapid dilution of groundwater chemicals in the surface water within a very short distance of the sediment-surface water interface. In addition, most chemical concentrations were less than literature effects levels, indicating minimal risk to ecological receptors. However, chromium remains under study for IPR Site 11 because of concentrations that exceed the background reference level.

D.8 REFERENCES

Balgooyen, T.G. 1976. "Behavior and Ecology of the American Kestrel in the Sierra Nevada Region of California." *University of California Publications in Zoology*. Volume 103.

California Environmental Protection Agency (Cal/EPA). 1996. *Guidance for Ecological Assessment at Hazardous Waste Sites and Permitted Facilities. Part A: Overview and Part B: Scoping Assessment*. Department of Toxic Substances Control. Sacramento, California.

Cal/EPA. 1997. *1997 California Ocean Plan*. State Water Resources Control Board. Sacramento, California. July.

Cal/EPA. 2001. California Wildlife Exposure Factor and Toxicity Database (Cal/Ecotox). Office of Environmental Health and Hazard Assessment. Ecotoxicology Unit. Sacramento, California.

Efroymson, R.A., G.W. Suter, B.E. Sample, and D. S. Jones. 1997a. "Preliminary Remediation Goals for Ecological Endpoints." ES/ER/TM-162-R1. Oak Ridge National Laboratory. Oak Ridge, Tennessee. August.

Efroymson, R.A., and others. 1997b. "Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision." Oak Ridge National Laboratory, Oak Ridge, Tennessee. ES/Gr/TM-85. 128 pages.

Keeney, T.W. 1998. "Mugu Lagoon: A Description of the Current Habitat Types of a Salt Marsh Estuary." Unpublished manuscript. Naval Air Station Point Mugu, California.

Long, E.R., D.D. MacDonald, S.L. Smith, and F.D. Calder. 1995. "Incidence of Adverse Biological Effects within Ranges of Chemical Concentrations in Marine and Estuarine Sediments." *Environmental Management.* Volume 19. Number 1. Pages 81 through 97.

MacDonald, K.B. 1976. "The Natural Resources of Mugu Lagoon, California." California Department of Fish and Game. Coastal Wetland Series No. 17.

Marschack, J.B. 2000. *A Compilation of Water Quality Goals.* California Environmental Protection Agency Regional Water Quality Control Board, Central Valley Region. August 2000.

Ministry of the Environment of British Columbia. 1989. "Criteria for Managing Contaminated Sites in British Columbia." In: Buchman, M. 1994. Quick Reference Cards, National Oceanographic and Atmospheric Administration, Hazmat Report 94.8.

Onuf, C.P. 1987. "The Ecology of Mugu Lagoon, California: An Estuarine Profile." U.S. Fish and Wildlife Service, Biological Report 85 (7.15). June.

Sample, B.E., D.M. Opresko, and G.W. Suter II. 1996. "Toxicological Benchmarks for Wildlife: 1996 Revision." ES/ER/TM-86/R3. Oak Ridge National Laboratory. Oak Ridge, Tennessee.

Shacklette, H.T. and J.G. Boerngen. 1994. "Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States." U.S. Geological Survey Professional Paper 1270.

Tetra Tech EM Inc. (Tetra Tech). 2000. Final Phase 1 Remedial Investigation Technical Memorandum. Naval Air Weapons Station, Point Mugu, California. Prepared for Department of the Navy, Naval Facilities Engineering Command, Southwest Division, San Diego, California. March.

Tetra Tech. 2001. "Risk to Vertebrates Technical Memorandum. Naval Base Ventura County, Point Mugu Site, California." Prepared for Department of the Navy, Naval Facilities Engineering Command, Southwest Division, San Diego, California. August.

Tetra Tech. 2003. "Draft Ecological Risk Assessment Addendum for Installation Restoration Program Sites 5 and 11, Naval Base Ventura County, Point Mugu Site, California." April 28.

Tetra Tech. 2004. "Remedial Investigation for Groundwater. Naval Base Ventura County, Point Mugu Site, California." Prepared for Department of the Navy, Naval Facilities Engineering Command, Southwest Division, San Diego, California. January.

U.S. Department of the Navy. 1997. "Development of Toxicity Reference Values for Conducting Ecological Risk Assessments at Naval Facilities in California, Interim Final Technical Memorandum." Naval Facilities Engineering Command, Engineering Field Activity West. San Bruno, California. September.

Navy. 1999. "Navy Interim Policy for Conducting Ecological Risk Assessment."

U.S. Environmental Protection Agency (EPA). 1989. *Risk Assessment Guidance for Superfund, Volume II, Environmental Evaluation Manual, Interim Final*. EPA/540/1-89/001. March.

EPA. 1992a. *Eco Update.* EPA, Office of Solid Waste and Emergency Response. Washington, DC. Volume 1. Number 5.

EPA. 1992b. *Framework for Ecological Risk Assessment*. EPA/630/R-92/001. February.

EPA. 1992c. "Supplemental Guidance to Risk Assessment Guidance for Superfund (RAGS): Calculating the Concentration Term." OSWER Pub. 9285.7-0811

EPA. 1995. "Water Quality Standards Unit's Screening List for Freshwater Surface Water." Region IV Water Management Division. Atlanta, Georgia.

EPA. 1996. *Soil Screening Guidance*. Office of Solid Waste and Emergency Response. Washington, DC. Publication 9355.4-23. July.

EPA. 1997. *ERA Guidance for Superfund: Process for Designing and Conducting ERAs. Interim Final.* Washington, DC. EPA/540/R-97/006. June.

EPA. 1999a. *Issuance of Final Guidance: ERA and Risk Management Principles for Superfund Sites.* EPA, Office of Solid Waste and Emergency Response. Washington, DC. Directive 9285.7-28 P. October.

EPA. 1999b. ". EPA Region 6, Office of Solid Waste, Center for Combustion Science and Engineering. August.

EPA. 2000. "Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California." May.

Zedler, J.B., C.S. Nordby, and B.E. Kus. 1992. The Ecology of Tijuana Estuary, California: A National Estuarine Research Reserve. NOAA Office of Coastal Resource Management, Sanctuaries, and Reserves Division. Washington DC.

APPENDIX E
ARARs IDENTIFICATION AND EVALUATION

APPENDIX E
CONTENTS

E.1 BACKGROUND E-1

E.2 SUMMARY OF CERCLA AND NCP REQUIREMENTS E-2

E.3 METHODOLOGY DESCRIPTION E-4

E.3.1 General E-4
Soils E-4
Groundwater E-5
Landfill Gas E-5
E.3.2 Identifying and Evaluating Federal ARARs E-5
E.3.3 Identifying and Evaluating State ARARs E-6
E.3.3.1 Solicitation of State ARARs under NCP E-6
E.3.3.2 Chronology of Efforts to Identify State ARARs E-6
E.3.4 Specific ARARs Evaluation E-8
E.3.4.1 Chemical-Specific ARARs E-8
E.3.4.2 Location-Specific ARARs E-13
E.3.4.3 Action-Specific ARARs E-16

E.4 REFERENCES E-18

APPENDIX E
TABLES

E-1 ARARs IRP Site 1 Naval Base Ventura County E-9

APPENDIX E
ATTACHMENTS

E-1 ARARs Solicitation Letters Navy to Agencies (January 18, 2000)

E-2 ARARs Solicitation Letters DTSC to Other Agencies (February 7, 2000)

E-3 ARARs Solicitation Letters Other Agency Responses (various dates)

E-4 ARARs Solicitation Letters DTSC to Navy (March 27, 2000)

E-5 ARARs Determination Letter Navy to DTSC (May 31, 2002)

E-6 ARARs Solicitation Letters DTSC to Navy (January 21, 2003)

E-7 ARARs Solicitation Letters IWMB to Navy (July 11, 2003)

APPENDIX E
ARARs IDENTIFICATION AND EVALUATION

Pursuant to U.S. Environmental Protection Agency (EPA) guidance (EPA 1988a), applicable or relevant and appropriate requirements (ARAR) are generally divided into three categories:

- Chemical-specific
- Location-specific
- Action-specific requirements

These categories were developed to aid in the identification of ARARs; some ARARs do not fall precisely into one group or another. ARARs are identified on a site basis for remedial actions where Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) authority is the basis for cleanup.

As the lead federal agency, the Navy has primary responsibility for identifying federal ARARs at Naval Base Ventura County (NBVC) Point Mugu. Potential federal ARARs that have been identified for the Site 1 revised feasibility study (FS) are discussed in the following sections.

E.1 BACKGROUND

Pursuant to the definition of the term on-site in 40 *Code of Federal Regulations* (CFR) section (§) 300.5, the on-station areas that are part of this action include Installation Restoration Program (IRP) Site 1, embodying areas otherwise known as the former Dredge Materials Storage Area; Northern Burn and Fill Area; Southern Burn and Fill Area; and Solid Waste and Fill Area. IRP Site 1 is located at the southeast corner of the military base and contains soil and groundwater contamination. However, there is acceptable and minimal risk to human health and the environment under future land use and institutional control scenarios. Proposed actions at the site include institutional controls, gas sampling and potential monitoring, and repairing and maintaining the existing final cover.

Four sets of solid waste regulations potentially apply to Site 1: *California Code of Regulations* (CCR) Titles 22, 23, and 27, and the Resource Conservation and Recovery Act (RCRA) Subtitle D. However, of these, CCR Titles 22 and 23 do not apply because they pertain to hazardous waste, which is not present at Site 1; the site is presumed to have waste similar to municipal solid waste. RCRA Subtitle D also does not pertain because the date it became effective was after the Site 1 landfill closed. For the purposes of this study, pertinent sections of CCR Title 27 were considered. For a more detailed description of applicable solid waste regulations, including a chronology and evolution of ARARs solicitation and determination, see Attachments E-1 through E-7.

The process of identifying ARARs began when the Navy requested that the California Environmental Protection Agency (Cal/EPA) Department of Toxic Substances Control (DTSC) identify potential ARARs. See Section E.3.3.1 for a description of the solicitation process.

E.2 SUMMARY OF CERCLA AND NCP REQUIREMENTS

Section 121(d) of CERCLA, 42 *United States Code* (USC) § 9621(d), as amended, states that remedial actions on CERCLA sites must attain (or the decision document must justify the waiver of) any federal or more stringent state environmental standards, requirements, criteria, or limitations that are determined to be legally applicable or relevant and appropriate.

Applicable requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that specifically address the situation at a CERCLA site. The requirement is applicable if the jurisdictional prerequisites of the standard show a direct correspondence when objectively compared with the conditions at the site. An applicable federal requirement is an ARAR. An applicable state requirement is an ARAR only if it is more stringent than a federal ARAR.

If the requirement is not legally applicable, then the requirement is evaluated to determine whether it is relevant and appropriate. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that, while not applicable, address problems or situations similar to the circumstances of the proposed response action and are well suited to the conditions of the site (EPA 1988a). A requirement must be determined to be both relevant and appropriate to be considered an ARAR.

The criteria for determining relevance and appropriateness are listed in 40 CFR § 300.400(g)(2) and include the following:

- The purpose of the requirement and the purpose of the CERCLA action;
- The medium regulated or affected by the requirement and the medium contaminated or affected at the CERCLA site;
- The substances regulated by the requirement and the substances found at the CERCLA site;
- Any variances, waivers, or exemptions of the requirement and their availability for the circumstances at the CERCLA site;
- The type of place regulated and the type of place affected by the release or CERCLA action;
- The type and size of structure or facility regulated and the type and size of structure or facility affected by the release or contemplated by the CERCLA action; and
- Any consideration of use or potential use of affected resources in the requirement and the use or potential use of the affected resources at the CERCLA site

According to CERCLA ARARs guidance (EPA 1988a), a requirement may be "applicable" or "relevant and appropriate," but not both. Identifying ARARs must be done on a site-specific basis and involve a two-part analysis. The first part of the analysis involves determining whether a given requirement is applicable. If a requirement is not applicable, the second part of the analysis involves determining whether the requirement is nevertheless both relevant and appropriate. It is important to explain that some regulations may be applicable or, if not applicable, may still be relevant and appropriate. When the analysis determines that a requirement is both relevant and appropriate, such a requirement must be complied with to the same degree as if it were applicable (EPA 1988a).

Table E-1 presents each ARAR that has been selected by the Navy. For the determination of relevance and appropriateness, the pertinent criteria were examined to determine whether the requirements addressed problems or situations sufficiently similar to the circumstances of the release or response action contemplated, and whether the requirement was well suited to the site. Negative determinations are discussed in the text only for specific cases.

To qualify as a state ARAR under CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), a state requirement must be:

- A state law
- An environmental or facility siting law
- Promulgated (of general applicability and legally enforceable)
- Substantive (not procedural or administrative)
- More stringent than the federal requirement
- Identified in a timely manner
- Consistently applied

To constitute an ARAR, a requirement must be substantive. Therefore, only the substantive provisions of requirements identified as ARARs in this analysis are considered to be ARARs. Permits are considered to be procedural or administrative requirements. Provisions of generally relevant federal and state statutes and regulations that were determined to be procedural or nonenvironmental, including permit requirements, are not considered to be ARARs. CERCLA 121(e)(1), 42 USC § 9621(e)(1), states that "No Federal, State, or local permit shall be required for the portion of any removal or remedial action conducted entirely on-site, where such remedial action is selected and carried out in compliance with this section." The term on site is defined for purposes of this ARARs discussion as "the areal extent of contamination and all suitable areas in very close proximity to the contamination necessary for implementation of the response action" (40 CFR § 300.5).

Nonpromulgated advisories or guidance issued by federal or state governments are not legally binding and do not have the status of ARARs. Such requirements, however, may be useful, and are "to be considered" (TBC). TBC (40 CFR § 300.400[g][3]) requirements complement ARARs but do not override them. They are useful for guiding decisions regarding cleanup levels or methodologies when regulatory standards are not available.

E.3 METHODOLOGY DESCRIPTION

The process of identifying and evaluating potential federal and state ARARs is described in this subsection.

E.3.1 GENERAL

As the lead federal agency, the Navy has the primary responsibility for the identification of federal ARARs for IRP Site 1. In preparing this ARARs analysis, the Navy undertook the following measures, consistent with CERCLA and the NCP:

- Identified federal ARARs for each response action alternative addressed in the FS, taking into account site-specific information for IRP Site 1
- Reviewed potential state ARARs identified by the state to determine whether they satisfy CERCLA and NCP criteria that must be met to constitute state ARARs
- Evaluated and compared federal ARARs and their state counterparts to determine which state ARARs are more stringent than the federal ARARs or are in addition to the federally required actions
- Reached a conclusion as to which federal and state ARARs are the most stringent and/or "controlling" ARARs for each alternative

Soils

Based on CERCLA, the human health risk assessments (HHRA) in the remedial investigation (RI) (Tetra Tech EM Inc. [Tetra Tech] 1998), and the ARARs, the remedial action objectives (RAO) for soils at Site 1 are proposed as follows:

- Prevent residential land use.
- Repair existing cover and improve drainage south of 13th Street, where necessary.
- Address physical safety hazard presented by surface solid waste located in the western part of the solid waste and fill areas.
- Prevent disturbance of the subsurface soil and contents of landfill.

Groundwater

Based on CERCLA, the HHRA and the ecological risk assessment in the draft remedial investigation groundwater study (Tetra Tech 1999), and the ARARs, the following RAO is proposed for surface water and groundwater at IRP Site 1:

- Prevent the use of IRP Site 1 groundwater as a source of drinking water.

Landfill Gas

Based on CERCLA and the ARARs, the following RAO is proposed for landfill gas at IRP Site 1:

- Verify that IRP Site 1 does not have methane gas levels greater than the limits outlined in 27 CCR 20919.5(a) and 20921(a)(1) and (2).

The remedial alternatives evaluated for soils, surface water, gas, and groundwater at Site 1 consider the need to continue existing actions, such as groundwater monitoring and maintaining the site access controls and final cover, as part of ongoing site activities. Thus, they are discussed in Section 3.0 as potential remedial measures, and they are included in and evaluated as part of several remedial alternatives.

The Site 1 remedial action alternatives considered for detailed analysis, and for which a preliminary ARARs determination is presented in this appendix, are as follows:

- Alternative 1: No Further Action
- Alternative 2: Institutional Controls
- Alternative 3: Institutional Controls; and Landfill Cover Repair, Maintenance, and Drainage Improvements

E.3.2 IDENTIFYING AND EVALUATING FEDERAL ARARS

The Navy is responsible for identifying federal ARARs as the lead federal agency under CERCLA and the NCP. The final determination of federal ARARs will be made when the Navy issues the record of decision (ROD). The federal government implements a number of federal environmental statutes that are the source of potential federal ARARs, either in the form of the statutes or regulations promulgated there under. Examples include RCRA, the CWA, the Safe Drinking Water Act, the Toxic Substances Control Act, and their implementing regulations, to name a few. See NCP preamble at 55 Federal Register (Fed. Reg.) 8764–8765 (1990) for a more complete listing.

The remedial alternatives were reviewed against all potential federal ARARs, including but not limited to those set forth at 55 Fed. Reg. 8764–8765 (1990), to determine if they were applicable or relevant and appropriate using the CERCLA and NCP criteria and procedures for ARARs identification by lead federal agencies.

E.3.3 IDENTIFYING AND EVALUATING STATE ARARS

The process of identifying and evaluating potential state ARARs by the state and the Navy is described in this subsection.

E.3.3.1 Solicitation of State ARARs under NCP

EPA guidance (EPA 1988b) recommends that the lead federal agency consult with the state when identifying state ARARs for remedial actions. In essence, the CERCLA/NCP requirements at 40 CFR § 300.515 for remedial actions provide that the lead federal agency request that the state identify chemical- and location-specific state ARARs upon completion of site characterization. The requirements also provide that the lead federal agency request identification of all categories of state ARARs (chemical-, location-, and action-specific) upon completion of identification of remedial alternatives for detailed analysis. The state must respond within 30 days of receipt of the lead federal agency requests. The remainder of this subsection documents the Navy's efforts to date to identify and evaluate state ARARs. The Navy followed the procedures set forth in 40 CFR § 300.515 and Section 7.6 of the Federal Facility Agreement (FFA) for remedial actions in seeking state assistance in identifying state ARARs.

E.3.3.2 Chronology of Efforts to Identify State ARARs

The following chronology summarizes Navy efforts to obtain state assistance in identifying state ARARs for the response action at NBVC Point Mugu. Key correspondence between the Navy and the state agencies relating to this effort has been included in the Administrative Record for this FS.

January 2000. The Navy formally requested state chemical-, location-, and action-specific ARARs for Site 1 on January 18, 2000. The letter was sent to Mr. Manny Alonzo of DTSC and copied to Mr. Peter Raftery of the California Regional Water Quality Control Board (RWQCB). This letter also contained the Navy's preliminary list of potential ARARs and is enclosed as Attachment E-1. DTSC then forwarded the letter on February 7, 2000, to other agencies including the following:

- California Department of Fish and Game
- Ventura County Air Pollution Control District
- California Coastal Commission

- Ventura County Environmental Health
- City of Oxnard Fire Department
- County of Ventura Division of Occupational Safety and Health
- California Integrated Waste Management Board
- City of Oxnard
- California Environmental Protection Agency Office of Environmental Health Hazard Assessment
- City of Camarillo

This letter is enclosed as Attachment E-2. These agencies were asked to evaluate the Navy's request for potential ARARs.

February 2000. DTSC received responses from several agencies, including the following:

- California Integrated Waste Management Board (Mr. Scott Humpert, February 9, 2000)
- County of Ventura (Mr. Gregory Smith, February 15, 2000)
- Ventura County Air Pollution Control District (Mr. Keith Duval, March 14, 2000)
- California Environmental Protection Agency Office of Environmental Health Hazard Assessment (Mr. David Siegel, March 3, 2000)
- California Coastal Commission (Mr. Mark Delaplaine, February 7, 2000)
- City of Oxnard (Ms. Sally Coleman, February 24, 2000)

These responses are enclosed as Attachment E-3.

March 2000. DTSC collected these responses and on March 27, 2000 responded to the Navy's request for potential ARARs. DTSC's letter is enclosed as Attachment E-4. DTSC indicated that the Navy identified almost all, if not all potential ARARs. However, it was premature for DTSC to concur on the preliminary ARARs determinations without completion of an FS containing proposed remedial alternatives. In addition, not all agencies had commented by that time.

May 2002. The Navy completed the draft FS (Battelle 2000) that presented a refined list of preliminary ARARs determinations. Based on comments received on the ARARs solicitation letter, the draft FS, new characterization data for Site 1, and new conclusions about threats to human health and the environment at the site, the Navy decided to prepare a draft revised FS.

Before completing the draft revised FS, the Navy presented the new FS approach in a storyboard meeting on May 9, 2002, at DTSC offices. On May 31, 2002, the Navy submitted a letter to DTSC that summarized the May 9th meeting and presented another preliminary ARARs determination. This letter is enclosed as Attachment E-5. Since this letter was sent, the Navy further refined the ARARs and an initial determination is presented in this revised FS.

December 2002 and January 2003. The Navy solicited another round of potential ARARs from DTSC and other state and local agencies in December 2002. DTSC compiled all responses from pertinent state and local agencies in a January 21, 2003 letter to the Navy, which is enclosed as Attachment E-6. Additional potential ARARs were received by the Navy in a July 11, 2003 letter from IWMB and this is enclosed as Attachment E-7.

E.3.4 SPECIFIC ARARS EVALUATION

The following subsections evaluate in detail the proposed ARARs, which are compared in Table E.1. A complete evaluation of all potential ARARs was sent with an August 4, 2004, letter to DTSC. That letter will be included in the administrative record to support the remedy selection process.

E.3.4.1 Chemical-Specific ARARs

Chemical-specific ARARs are health- or risk-based numerical values or methodologies that, when applied to site-specific conditions, establish the acceptable amount or concentration of a chemical that may be found in, or discharged to, the ambient environment.

Federal Groundwater ARARs

One of the significant issues in identifying ARARs for groundwater under the Safe Drinking Water Act and RCRA is whether the groundwater at the site can be classified as a source of drinking water. EPA groundwater policy is set forth in the preamble to the NCP (55 Fed. Reg. 8666, 8752–8756 [1990]). This policy uses the groundwater classification system set forth in the draft EPA Guidelines for Groundwater Classification under the EPA Groundwater Protection Strategy (EPA 1986). Under this policy, groundwater is classified in one of three categories (Class I, II, or III), based on ecological importance, replaceability, and vulnerability considerations. Irreplaceable groundwater that is currently used by a substantial population or groundwater that supports a vital habitat is considered to be Class I. Class II consists of groundwater that is currently being used or that might be used as a source of drinking water in the future. Groundwater that cannot be used for drinking water because of insufficient quality (e.g., high salinity or widespread, naturally occurring contamination) or quantity is considered to be Class III. EPA guidelines define Class III groundwater as groundwater with total dissolved solids concentrations more than 10,000 milligrams per liter (mg/L) and a yield of less than 150 gallons per day (EPA 1986). Class III groundwater also can be classified based on economic or technological treatability tests as well as quality or quantity (both criteria are not needed, just one or the other). For aquifers with Class III characteristics, maximum contaminant levels are neither applicable nor relevant and appropriate and are not used to determine preliminary response action goals (EPA 1986; 55 Fed. Reg. 8666, 8750–8754 [1990]). The Navy has found that groundwater below Site 1 has a total dissolved solids concentration exceeding 10,000 mg/L. Therefore, cleanup standards promulgated under the Safe Water Drinking Act are not applicable or relevant and appropriate.

TABLE E-1. ARARs IRP SITE 1 NAVAL BASE VENTURA COUNTY

Location/Action	Requirement	Prerequisite	Citation	ARAR Determination A	ARAR Determination RA	Comments
Location-Specific						
California Coastal Act*						
Within coastal zone	Regulates activities associated with development to control direct significant impacts on coastal waters and to protect state and national interests in California coastal resources.	Activities affecting the coastal zone including lands there under and adjacent shoreland.	Public Resources Code Sections 30000 – 30900 and 14 CCR 13001-13666.4	Yes	No	IRP Site 1 is in a coastal area and therefore is subject to the California Coastal Act.
Coastal Zone Management Act*						
Within coastal zone	Conduct activities in a manner consistent with approved state management programs.	Activities affecting the coastal zone including lands thereunder and adjacent shoreland.	CZMA § 307(c)(1); also see 15 CFR § 930.36(b)	Yes	No	IRP Site 1 is in a coastal area and , therefore is subject to the CZMA.
California Endangered Species Act*						
Plant and animal habitat	Prohibits the taking of birds and mammals, including the taking by poison	Plants and animals present at Site 1	Fish and Game Code Section 2080	Yes	No	Endangered species exist at or near Site 1. No impacts are expected.
Endangered Species Act of 1973*						
Plant and animal habitat	Prohibits the taking of birds and mammals, including the taking by poison	Plants and animals present at Site 1	16 USC 1531-1543	Yes	No	Endangered species exist at or near Site 1. No impacts are expected.
Migratory Bird Treaty Act of 1972*						
Migratory bird area	Protects almost all species of native birds in the U.S. from unregulated “taking,” which can include poisoning at hazardous waste sites.	Presence of migratory birds.	16 USC § 703	Yes	No	Migratory birds are present at the site. No impacts from contaminants are expected.

TABLE E-1 (Continued). ARARs IRP SITE 1 NAVAL BASE VENTURA COUNTY

Location/Action	Requirement	Prerequisites	Citation	ARAR Determination		Comments
				A	RA	
Chemical-Specific						
State Water Resources Control Board and Regional Water Quality Control Board*						
N/A	Describes the water basins in Los Angeles region; establishes beneficial uses of ground and surface waters; establishes water quality objectives, including narrative and numerical standards; establishes implementation plans to meet water quality objectives and protect beneficial uses; and incorporates state-wide water quality control plans and policies.	Site 1 is within the Los Angeles Region. Site 1 is an industrial site and construction in an area of greater than 1 acre may occur.	Comprehensive Water Quality Control Plan for the Los Angeles Basin (Water Code 13240)	Yes	No	Substantive provisions regarding NPDES storm water discharges (40 CFR Part 122) are ARARs for industrial or construction sites greater than 1 acre.
Action-Specific						
Combined SWRCB/IWMB Regulations for Solid Waste*						
Precipitation and drainage controls	Units and their respective containment structures shall be designed and constructed to limit to the greatest extent possible, ponding, infiltration, inundation, erosion, slope failure, washout, and overtopping under the precipitation condition specified in Table 4.1.	Discharge of waste to land after 18 July 1997.	27 CCR 20365	No	Yes	Substantive requirements to control precipitation and drainage will be applicable for remedial alternatives that maintain or repair existing final cover.
Emergency Response	Potential emergency conditions that may exceed the design of the site and could endanger the public health or environment must be anticipated. Response procedures for these conditions must be addressed in the remedial design or remedial action plans.	Closure or postclosure maintenance standards for disposal sites and landfills of 27 CCR, Chapter 3, Subchapter 5, Article 2. Scope and applicability pursuant to 27 CCR 21100.	27 CCR 21130	No	Yes	Relevant and appropriate requirements for responding to emergency conditions for closed or closing sites. Detailed instruction to be included in new or amended postclosure documents.

TABLE E-1 (Continued). ARARs IRP SITE 1 NAVAL BASE VENTURA COUNTY

Location/Action	Requirement	Prerequisites	Citation	ARAR Determination		Comments
				A	RA	
Site Security	All points of access to the site must be restricted, except permitted entry points. All monitoring, control, and recovery systems shall be protected from unauthorized access.	Closure or postclosure maintenance standards for disposal sites and landfills of 27 CCR, Chapter 3, Subchapter 5, Article 2. Scope and applicability pursuant to 27 CCR 21100.	27 CCR 21135 (f) and (g)	No	Yes	Relevant and appropriate requirements for site security of closed or closing sites. Detailed instruction to be included in new or amended postclosure documents.
Structure Removal	Site structures and leachate and gas control systems not intended for reuse will be dismantled and removed at the time of closure to protect public health and safety.	Closure or postclosure maintenance standards for disposal sites and landfills of 27 CCR, Chapter 3, Subchapter 5, Article 2. Scope and applicability pursuant to 27 CCR 21100.	27 CCR 21137	No	Yes	Relevant and appropriate requirements for site security of closed or closing sites. Detailed instruction to be included in new or amended postclosure documents.
Landfill gas control	The operator shall ensure that landfill gases generated at a disposal site are controlled. Methane must not exceed 1.25 percent by volume in air within on-site structures, concentrations of methane gas migrating from the landfill must not exceed 5 percent by volume in air at the property boundary, and trace gases shall be controlled to prevent adverse acute and chronic exposure toxic and/or carcinogenic compounds.	All solid waste units with continued maintenance and monitoring.	27 CCR 20920(b)(2); 20921(a)(1), (2), and (3).	No	Yes	Relevant and appropriate because Site 1 is continuing to be maintained.
Closure and postclosure maintenance and future land use	The final cover shall function with minimum maintenance and provide waste containment to protect public health and safety by controlling at a minimum, vectors, fire, odor, litter, and landfill gas migration. The final cover shall also be compatible with postclosure land use.	Solid waste units experiencing ongoing maintenance and monitoring.	Pertinent sections of 27 CCR 21140 – 21190	No	Yes	Substantive requirements pertaining to criteria for closure and postclosure maintenance and future land use are relevant and appropriate for remedial alternatives that maintain or repair existing final cover and have institutional controls.

TABLE E-1 (Continued). ARARs IRP SITE 1 NAVAL BASE VENTURA COUNTY

Location/Action	Requirement	Prerequisites	Citation	ARAR Determination		Comments
				A	RA	
Ventura County Air Pollution Control District Rules						
Grading and earth-moving activities in placing final cover and consolidating wastes.	A person shall not discharge into the atmosphere from any single source of emission any air contaminants for a period aggregating more than 3 minutes in any 1 hour which are: 1. As dark or darker in shade as that designated as No. 1 on the Ringelmann Chart; or, 2. Of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke described in subsection A.1 of this rule.	Emission of air contaminants.	VCAPCD Rule 50	Yes	No	The Navy has concluded that this requirement is a potential ARAR for earth moving associated with maintaining the final cover.

Notes:

* Statutes, regulations, and their citations are provided as headings to identify general categories of ARARs for the convenience of the reader. Listing a statute or a regulation does not indicate that the Navy accepts the entire statute or regulation as an ARAR. Specific ARARs are addressed in the table below each general heading. Only substantive requirements of the specific citations are considered ARARs.

A	applicable	IWMB	California Integrated Waste Management Board
ARAR	applicable or relevant and appropriate requirement	NA	Not applicable
CAI	closed, abandoned, or inactive	NPDES	National Pollutant Discharge Elimination System
CCR	*California Code of Regulations*	RA	Relevant and appropriate
CFR	*Code of Federal Regulations*	SWRCB	California State Water Resources Control Board
CZMA	Coastal Zone Management Act	USC	*United States Code*
IRP	Installation Restoration Program	VCAPCP	Ventura County Air Pollution Control Program

State Groundwater ARARs

The Comprehensive Water Quality Control Plan for the Los Angeles Basin (Basin Plan), California Water Code § 13240, establishes beneficial uses of groundwater and surface water; identifies water quality objectives (WQO), including narrative and numerical standards; establishes implementation plans to meet WQOs and protect beneficial uses; and incorporates state-wide water quality control plans and policies. NBVC is located within the Los Angeles Basin; thus, the substantive portions of the Basin Plan are applicable requirements. State of California Water Resources Control Board (SWRCB) Resolutions 68-16, 88-63, 92-49 are incorporated in the Basin Plan by reference. The average level of TDS at NBVC Point Mugu in the semi-perched aquifer is greater than 13,500 mg/L. The Navy is actively seeking a change for the semi-perched aquifer to nonbeneficial use. The semiperched aquifer, although so designated, is not being used as a source of drinking water. The RWQCB is currently evaluating the Navy's request to remove the municipal and domestic supply designation from the semiperched aquifer at NAS Point Mugu.

E.3.4.2 Location-Specific ARARs

Location-specific ARARs are requirements that control the conduct of activities at the site, and are applicable or relevant and appropriate based on the characteristics of the site or its immediate environment.

Characteristics of the site relevant to an ARAR evaluation are: (1) it is within a coastal management zone and activities will be conducted on that site that will affect the coastal zone, (2) threatened or endangered species are present, and (3) migratory birds are present. Each characteristic and its ARARs are discussed in detail below.

Coastal Zone

The Coastal Zone Management Act (CZMA), § 307 (c)(1), 15 CFR § 930.30, states that any federal agency activity, whether it occurs inside or outside the coastal zone, that affect any land or water uses or natural resources of the coastal zone be conducted in a manner that is consistent with approved state coastal zone management programs. California's CZMA policies include limiting tidal water filling and maintaining marshes and mudflats to the fullest extent possible to conserve wildlife, abate pollution, and protect the beneficial uses. Because Site 1 is located along the coast, the CZMA is applicable. The remedial activities will be conducted in accordance with the substantive requirements of the CZMA.

The California Coastal Act of 1976 (California Public Resources Code [Cal. Pub. Res. Code] §§ 30000–30900 and Cal. Code Regs. Title 14, §§ 13001–13666.4) regulates activities associated with development to control direct significant impacts on coastal waters and to protect state and national interests in California coastal resources. The California Coastal Act policies constitute the standards used by the California Coastal Commission in its coastal development permit

decisions and for the review of local coastal programs. These policies contain the following substantive requirements:

- Protection and expansion of public access to the shoreline and recreation opportunities (Cal. Pub. Res. Code §§30210-30224)
- Protection, enhancement, and restoration of environmentally sensitive habitats including intertidal and nearshore waters, wetlands, bays and estuaries, riparian habitat, grasslands, streams, lakes, and habitat for rare or endangered plants or animals (Cal. Pub. Res. Code §§ 30230-30240
- Protection of productive agricultural lands, commercial fisheries, and archaeological resources (Cal. Pub. Res. Code §§ 30234, 30241-30244)
- Protection of the scenic beauty of coastal landscapes (Cal. Pub. Res. Code §§ 30251)
- Provisions for expansion, in an environmentally sound manner, of existing industrial ports and electricity generating power plants (Cal. Pub. Res. Code § 30264). This regulation is applicable because IRP Site 1 is within the coastal zone.

Biological Resources

The following list of plants and animals were determined to be present at Site 1. This information is condensed from a list of all species found at NBVC Point Mugu, shown in Table A.1 in Appendix A.

- Northern harrier (*Circus cyaneus*)
  CALIFORNIA SPECIES OF SPECIAL CONCERN – no ARAR
  FEDERAL MIGRATORY BIRD – ARAR
- Globose dune beetle (*Coelus globosus gravida*) – no ARAR
- Sandy beach tiger beetle (*Cicindela hirticollis gravida*) – no ARAR
- Saltmarsh skipper (*Panoquina errans*) – no ARAR
- Southwestern pond turtle (*Clemmys marmorata pallida*)
  CALIFORNIA SPECIES OF SPECIAL CONCERN – no ARAR
- American peregrine falcon (*Falco peregrinus anatum*)
  FEDERAL ENDANGERED – ARAR
  STATE ENDANGERED – ARAR
  FEDERAL MIGRATORY BIRD – ARAR
- Ferruginous hawk (*Buteo regalis*)
  FEDERAL MIGRATORY BIRD – ARAR
- Burrowing owl (*Athene cunicularia*)
  CALIFORNIA SPECIES OF SPECIAL CONCERN – no ARAR
  FEDERAL MIGRATORY BIRD – ARAR

- Loggerhead shrike (*Lanium ludovicianus*)
  CALIFORNIA SPECIES OF SPECIAL CONCERN – no ARAR
  FEDERAL MIGRATORY BIRD—ARAR

- Large-billed savannah sparrow (*Passerculus sandwichensis rostratus*)
  CALIFORNIA SPECIES OF SPECIAL CONCERN – no ARAR
  FEDERAL MIGRATORY BIRD – ARAR

- Tricolored blackbird (*Agelaius tricolor*)
  CALIFORNIA SPECIES OF SPECIAL CONCERN – no ARAR
  FEDERAL MIGRATORY BIRD – ARAR

- Deer mouse (*Peromyscus maniculatus*); omnivorous small mammal – no ARAR

- American kestrel (*Falco sparverius*); omnivorous bird
  FEDERAL MIGRATORY BIRD – ARAR

- Pickleweed (*Salicornia virginica/subterminale*)
  NON-RARE OR -ENDANGERED OR -THREATENED NATIVE CALIFORNIA SPECIES – no ARAR

- Dusky-footed woodrat (*Neotoma fuscipes*, no subspecies) – no ARAR

The California Endangered Species Act (California Fish and Game Code, § 2080), prohibits the import, export, possession, poisoning, or selling of any endangered or threatened species. The substantive provisions of § 2080 is applicable because threatened and endangered species have been observed at or near Site 1. The selected remedial alternative will prevent harm to threatened or endangered species including birds and mammals by containing contaminants.

The Endangered Species Act (ESA) of 1973 (16 USC §§ 1531-1543) provides a means for conserving various species of fish, wildlife, and plants that are threatened with extinction. The ESA defines an endangered species and provides for the designation of critical habitats. Federal agencies may not jeopardize the continued existence of any listed species or cause the destruction of adverse modification of critical habitat. Under Section 7(a) of the ESA, federal agencies must carry out conservation programs for listed species. The Endangered Species Committee may grant an exemption for agency action if reasonable mitigation and enhancement measures, such as propagation, transplantation, and habitat acquisition and improvement, are implemented. Consultation regulations at 50 CFR § 402 are administrative in nature and, therefore, are not ARARs. However, they may be TBCs to comply with the substantive provisions of the ESA. The Navy response action to be conducted on NBVC Point Mugu Site 1 will comply with this ARAR.

Migratory Birds

The Migratory Bird Treaty Act of 1972 (16 USC §§ 703-712) prohibits, at any time, using any means or manner, the pursuit, hunting, capturing, and killing or attempting to take, capture, or kill any migratory bird. This can include poisoning at waste sites. This act also prohibits the

possession, sale, export, and import of any migratory bird or any part of a migratory bird, as well as nests and eggs. A list of migratory birds for which this requirement applies is found at 50 CFR § 10.13. Because several species of migratory birds are present at Site 1, this regulation is applicable.

Floodplains Management

Review of Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) for the site revealed that there is no coverage or flood study. This is typical for military installations. However, NBVC contracted its own flood study (U.S. Army Corps of Engineers 1998). The study shows that Site 1 is not within the 100-year floodplain or floodway. Therefore, federal and state regulations pertaining to floodplains are not ARARs.

E.3.4.3 Action-Specific ARARs

Action-specific ARARs are technology- or activity-based requirements or limitations for remedial activities. These requirements are triggered by the particular remedial activities conducted at the site and suggest how a selected remedial alternative should be achieved. These action-specific requirements do not in themselves determine the remedial alternative; rather, they indicate how a selected alternative must be conducted.

Stormwater at Construction and Industrial Sites

The SWRCB and RWQCB Comprehensive Water Quality Plan for the Los Angeles Basin regulates storm water discharges. Actions carried out at Site 1 must meet the substantive provisions of the state-issued NPDES storm water permit for general industrial sites or construction sites 1 acre or greater through best management practices or existing permits held by the base.

Groundwater

During the RI phase of the IRP for Site 1, the Navy monitored ten wells in and around IRP Site 1. Sampling results from these wells do not indicate that IRP Site 1 is contributing any contaminants to ground or surface water. 27 CCR § 20080(g) and 20950 regulations (detection monitoring program) address detection of threats to water quality by a waste unit. However, these regulations are not ARARs because no threat to water quality from IRP Site 1 has been identified. There is no unacceptable risk to ecological receptors. Data collected from IRP Site 1 and the receiving water at IRP Site 11 confirm this. Furthermore, there is no risk to human health because there is no beneficial use as drinking water and therefore no pathway.

Remedial Alternatives

Site 1 was closed in accordance with regulations in place at the time operations ceased and is a closed site as defined in 27 CCR 20950(a)(1) and 21099(a). It is also a closed, abandoned, or inactive (CAI) unit which is defined as a waste management unit that was closed, abandoned, or inactive prior to November 27, 1984. Based on this classification and the range of alternatives identified in this FS, the following requirements under Title 27 of CCR § 20365, precipitation and drainage controls; and pertinent portions of §§ 21140–21190, closure and postclosure maintenance and future land use may be ARARs. The selected remedial alternatives involving erosion and drainage controls, cover maintenance, and land use restrictions can be designed to comply with the substantive portions of Title 27.

Remedial alternatives that involve construction actions, such as regrading and cover maintenance, may generate fugitive particulate air emissions. For that reason, Rule 221 promulgated by the Ventura County Air Pollution Control District is considered applicable. The remedial activities the Navy will conduct at Site 1 will comply with the substantive portions of Rule 221, which controls particulate emissions.

E.4 REFERENCES

Battelle. 2000. Draft Feasibility Study, Installation Restoration Program Site 1, Naval Air Station Point Mugu, California. September

Tetra Tech EM Inc. (Tetra Tech) 1998. Final Draft *Phase I Remedial Investigation, Technical Memorandum, Naval Air Weapons Station, Point Mugu, California*. Volumes 1-111. Prepared for Department of the Navy, Naval Facilities Engineering Command, Engineering Field Activity West, San Bruno, CA. June.

Tetra Tech. 1999. Draft *Remedial Investigation Groundwater Study, Naval Air Station, Point Mugu, California*. Volumes 1-111. Prepared for Department of the Navy, Southwest Division, Naval Facilities Engineering Command, San Diego, CA. August.

U.S. Army Corps of Engineers. 1998. *Floodplain Evaluation Report. Naval Air Weapons Station, Point Mugu, California*. August.

U.S. Environmental Protection Agency (EPA). 1986. *Guidelines for Ground-Water Classification under the EPA Ground-Water Protection Strategy, Final Draft.* WH-560G. Office of Ground-Water Protection. December.

EPA. 1988a. *Guidance for Conducting Remedial Investigations and Feasibility Studies Under the Comprehensive Environmental Response, Compensation, and Liability Act*. EPA/540/G-89/004. October.

EPA. 1988b. *CERCLA Compliance with Other Laws Manual, Draft Guidance*. EPA/540/G-89/006. Office of Solid Waste and Emergency Response, August.

EPA. 1991. *Conducting Remedial Investigations/Feasibility Studies for CERCLA Municipal Landfill Sites*. EPA/540/P-91/001. Office of Emergency and Remedial Response. February.

EPA. 1996. *Application of the CERCLA Municipal Landfill Presumptive Remedy to Military Landfills*. 9355.0-67FS. Office of Solid Waste and Emergency Response. December.

ATTACHMENT E-1

ARARS SOLICITATION LETTERS
NAVY TO AGENCIES (JANUARY 18, 2000)

BASE COPY

N63126.000660
NBVC PT. MUGU
SSIC No. 5090.3

DEPARTMENT OF THE NAVY
SOUTHWEST DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132-5190

5090
Ser 5DEN.GC/0156
January 18, 2000

Mr. Manny Alonzo
Project Manager
Department of Toxic Substances Control
5796 Corporate Avenue
Cypress, CA 90630

SUBJECT: IDENTIFICATION OF STATE "APPLICABLE" OR "RELEVANT AND APPROPRIATE" REQUIREMENTS (ARARS) FOR IR SITES 1, 2, 4, 6, 8, 9, AND 24 AT NAVAL AIR WEAPONS STATION, POINT MUGU, CALIFORNIA

Dear Mr. Alonzo:

Pursuant to previous discussions and to accomplish the goals of the Naval Air Weapons Station, Point Mugu, Installation Restoration (IR) program, we are hereby requesting that the Department of Toxic Substances Control (DTSC) identify potential State chemical-specific, action specific, and location specific ARARs for the cleanup of IR Sites 1, 2, 4, 6, 8, 9, and 24.

In addition, the Department of the Navy (DON) is requesting that the State of California identify any other criteria, advisories, guidance, and proposed standards that the State requests be considered (TBCs) for the above identified sites. Please coordinate responses from all California state agencies.

In order to assist DTSC in identifying ARARs, we are enclosing a listing of State and Federal ARARs. The first half of the listing is dedicated to all potential ARARs and the second half is Navy recommended ARARs.

Timely identification of potential State ARARs is required under Section 121(d)(2)(A) of CERCLA and under the National Contingency Plan (NCP), 40 CFR 300.400(g) and 300.515(d) & (h). Experience to date around the country has shown that a failure to identify ARARs with sufficient precision, early in the process, can cause severe disruptions in timely implementation of remedial action. To ensure timely and complete ARARs identification, please include the following information:

5090
Ser 5DEN.GC/0156
January 18, 2000

1. A specific citation to the statutory or regulatory provision(s) for the potential State ARAR and the date of enactment or promulgation.

2. A brief description of why the potential STATE ARAR is applicable or relevant and appropriate to the particular IR Site.

3. A description of how the potential State ARAR would apply to potential remedial action, including: specific numeric discharge, effluent, or emission limitations; hazardous substance/constituent action or cleanup levels; etc., if the State intends to take the position that the potential State ARAR includes such limitations, levels, etc.

4. If the State believes its proposed ARAR is more stringent than the corresponding Federal ARAR, please provide the rationale and technical justification for this position.

5. If the State determines that there is not enough information to fully respond to our request, please identify any additional information that would be required to support identification of State ARARs and their application.

Consistent with 40 CFR 300.515(h)(2), we are requesting that you send a response via first class mail addressed to me and postmarked within 60 calendar days of receipt of this request. If you have any technical questions concerning this request, please call me at (619) 532-4228. For any legal questions, please call Mr. Perry Sobel, Associate Counsel (Environmental) at (619) 532-2312.

Sincerely,

DONALD E. A. RINGEL, P.E.
Desert Environmental Team Leader

Enclosure: 1. ARARs listing

5090
Ser 5DEN.GC/0156
January 18, 2000

Copy to:
Mr. Peter Raftery (w/o enclosure)
Regional Water Quality Control Board
Los Angeles Region

Mr. Daniel Janke (w/o enclosure)
Battelle

ATTACHMENT E-2

ARARS SOLICITATION LETTERS
DTSC TO OTHER AGENCIES (FEBRUARY 7, 2000)

Department of Toxic Substances Control

Edwin F. Lowry, Director
5796 Corporate Avenue
Cypress, California 90630

Winston H. Hickox
Agency Secretary
California Environmental
Protection Agency

Gray Davis
Governor

DATE

FIELD(Mr) FIELD(First) FIELD(Last)
FIELD(Agency)
FIELD(Address)
FIELD(City), FIELD(State) FIELD(Zip code)

REQUEST FOR APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR IRP SITES 1, 2, 4, 6, 8, 9, AND 24 AT NAVAL AIR WEAPONS STATION POINT MUGU, CALIFORNIA

Dear FIELD(Mr) FIELD(Last):

The Department of Toxic Substances Control (DTSC) is overseeing site cleanup actions pursuant to California Health and Safety Code Section 6.8 at the Naval Air Weapons Station Point Mugu. Consequently, DTSC has the responsibility to contact state and local agencies and solicit these agencies' applicable or relevant and appropriate requirements (ARARs) for site cleanup activities at NAS Point Mugu. DTSC hereby requests that you identify all your Agency's ARARs (chemical, location and action specific) for the remedial actions at Sites 1, 2, 4, 6, 8, 9, and 24.

ARARs are those legally applicable or relevant and appropriate standards, requirements, criteria or limitations of environmental laws defined in the CERCLA, Section 121 (d) (2) and as further defined in the National Contingency Plan (NCP), 40 CFR, Section 300. More information on ARARs is available at the U.S. Environmental Protection Agency Web Site at http://www.epa.gov/oerrpage/superfund/contacts/sfhotlne/arar.pdf.

Pursuant to the NCP, the Navy is required to comply with all ARARs, i.e., laws and regulations promulgated by your agency which specifically address the hazardous substance, pollutant, contaminants, removal/remedial action, location or other circumstance found at these sites. Please include the specific appropriate citation(s) of the statute, regulation, code, or rule that you have identified as an ARAR.
The ARARs will be utilized in the evaluation and determination of best technologies to treat the contamination at the above sites. Enclosed for your reference are a summary, a map and a table containing a brief description of the sites, contaminants detected during previous investigations, and the remedial actions being considered by the Navy.

Printed on Recycled Paper

Your prompt identification of ARARs will ensure that the remedial actions are in compliance with California's laws and regulations. We appreciate your response to this request within 30 days of receipt of this letter. Please direct your response to Mr. Manny Alonzo at the above letterhead address.

If you have questions or would like to discuss this matter, please contact Mr. Manny Alonzo at (714) 484-5425.

Sincerely,

Milasol C. Gaslan, P.E., Unit Chief
Federal Facilities Unit "A"
Office of Military Facilities

Enclosures (3)

Mr	First	Last	Agency	Address	City	State	Zip code
Mr.	Richard	Baldwin	Ventura County Air Pollution Control District	702 County Square Drive	Ventura	California	93003
Ms.	Becky	Steckler	California Coastal Commission	45 Freemont Street, Suite 200	San Francisco	California	94150-2219
Mr.	Steven C.	Kephart	Ventura County Environmental Health	800 South Victoria Avenue	Ventura	California	93009-1730
Mr.	Steve	Elkinton	City of Oxnard Fire Department	251 South C Street	Oxnard	California	93030
Mr.	Dean	Fryer	Division of Occupational Safety and Health	1655 Mesa Verde Avenue, Room 150	Ventura	California	93003
California	Coastal	Commission	South Cental Coast Region	89 South California Street, Suite 200	Ventura	California	93001-2801
Ms.	Charlene	Herbst	California Integrated Waste Management Board	8800 Cal Center Drive	Sacramento	California	95826
Mr.	Scott	Flint	California Department of Fish and Game OSPR	P.O. Box 944209	Sacramento	California	94244-2090
Mr.	Gary	Gillig	City of Oxnard	300 West Third Street	Oxnard	California	93030
Mr.	Mark	Norris	City of Oxnard	6001 South Perkins Road	Oxnard	California	93033
Mr.	Allan	Hirsh	Office of Environmental Health Hazard Assessment	301 Capitol Mall, Room 205	Sacramento	California	95814
Mr.	Jerry	Bankston	City of Camarillo	601 Carmen Drive	Camarillo	California	93010

Summary

Naval Air Weapons Station Point Mugu

NAWS Point Mugu is located in Ventura County, California, about 50 miles northwest of Los Angeles. NAWS Point Mugu is bordered by Highway I on the north and east, the Pacific Ocean on the south and west, and Ventura County game reserve on the west and northwest.

NAWS Point Mugu comprises about 4,500 acres and contains 897 buildings, including 568 housing units. Many of the buildings were constructed on dredged material and other fill. The installation employs over 9,000 personnel, including 2,427 military personnel, 4,157 civilian personnel, and 2,500 contractors.

The Navy established temporary operations at Point Mugu in 1944. As part of the Bureau of Aeronautics, about 4,500 acres were set aside for the Navy. The Navy has conducted operations at Point Mugu since 1945. In 1946, the Naval Air Missile Test Center was commissioned, and in 1949, the U.S. Naval Air Station was commissioned. Funding for a permanent Navy site at Point Mugu was appropriated by the Congress in 1947. The Pacific Missile Test Range was established in 1957, which was renamed the Pacific Missile Test Center in the mid-1970s. In 1993, the names were revised again: the Pacific Missile Test Center became Naval Air Warfare Center Weapons Division (NAWCWPNS), and the U.S. Naval Air Station became Naval Air Weapons Station.

The environmental restoration at Point Mugu is part of the Installation Restoration Program (IRP). The Navy's IRP follows the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) and the Superfund Amendments and Reauthorization Act (SARA) of 1986. The Navy IRP's is a component of the Defense Environmental Restoration Program (DERP) which is codified in SARA 211. It is designed to identify, assess, and remediate contamination from Navy and Marine Corps past hazardous substances disposal activities.

The Navy IR program follows a process developed by the US Environmental Protection Agency (EPA) to identify, assess, and remediate contamination at hazardous wastes sites. This process is identified in the National Oil and Hazardous Substances Contingency Plan (NCP) and consists of three main activities:

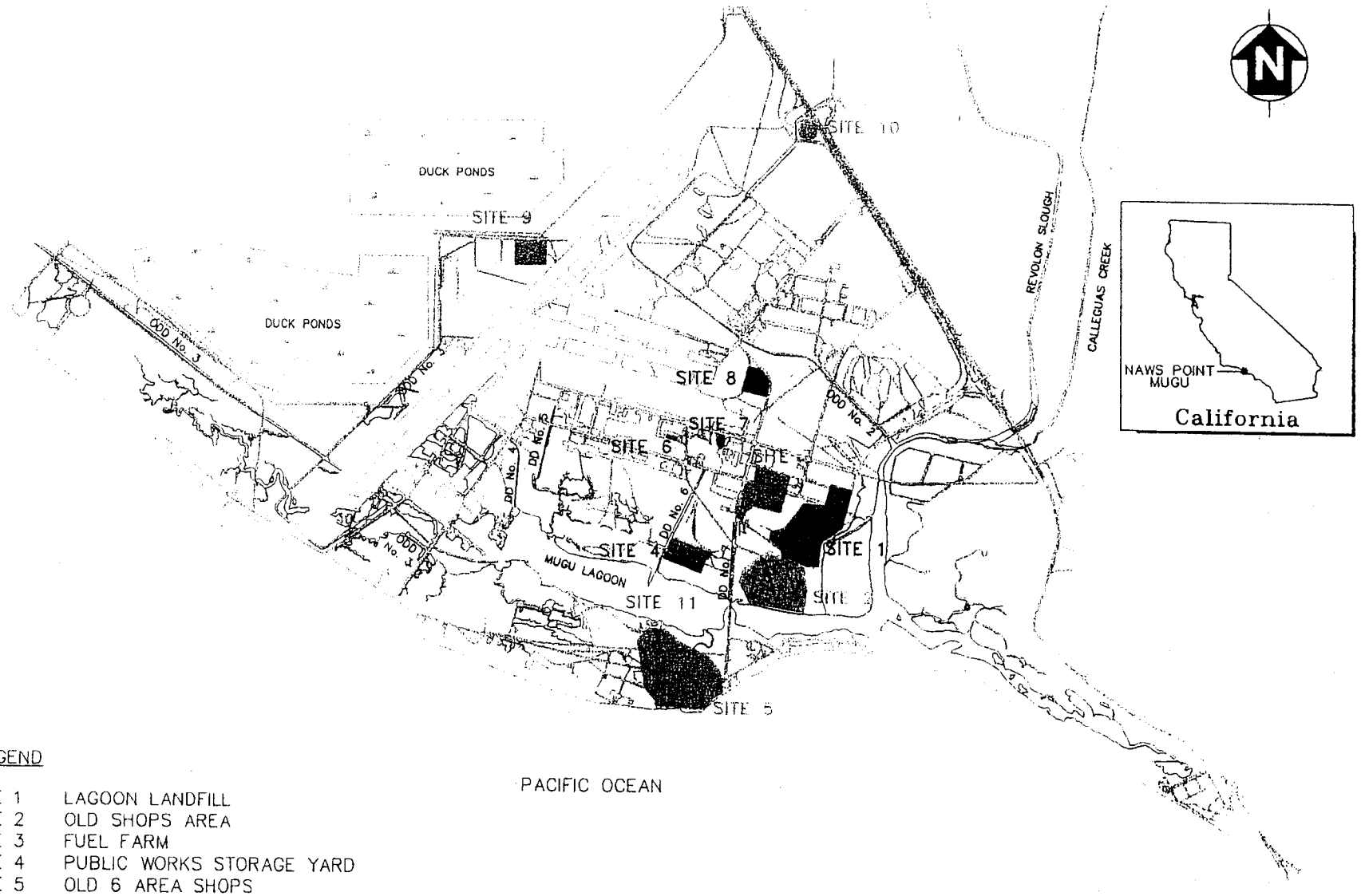
- Preliminary Assessment and Site Inspection,
- Remedial Investigation and Feasibility Study, and
- Remedial Design and Remedial Action.

Most of the sites identified in the IRP have gone through the Preliminary Assessment, Site Inspection, and Remedial Investigation. A Feasibility Study will be conducted to propose a remedy at each site.

NAWS Point Mugu Site Description

Site Name	Description	Contaminants detected	Potential Remedial Alternatives
IRP Site 1 - Lagoon Landfill	A Tidal saltwater marsh used for disposal of lowland filling, dredge materials, and solid waste landfilling and burning operations from 1952 to the mid 1970s	Semivolatile organic compounds, Polychlorinated Byphenyls	No Action, Excavation and disposal, Cap
IRP Site 2 - Old Shops Area	An active 30-acre area operated as a vehicle maintenance area, partially developed and partially covered with grass. Disposal on the surface of battery acid, solvents, thinners, paint wastes, pesticides rinsates, and waste oil occured from 1942 to 1980	Polychlorinated Byphenyls	No action, Excavation and disposal, Limit access
IRP Site 4 - Public Works Storage Yard	Site 4 was a 12-acre area located about 600 feet west of Laguna Road and 300 feet North of Mugu Lagoon. It was a storage yard for vehicles, and maintenance equipment. Removal of contaminated soils and restoration of the site as wetland and bird habitat occurred in 1997	Polynuclear Aromatic Hydrocarbons, Polychlorinated Byphenyls, pesticides and lead.	Limit access, No action, (Excavation and disposal was performed in 1997)
IRP Site 6 - Building 311 Yard	Small unpaved area (250 x 200 feet) immediately south of Building 311 and approximately 3000 feet north of Mugu Lagoon. It was used between 1965 and 1978 for disposal of plating wastes; paint strippers, sludge, and chips; thinners and solvents; sand, and glass beads from sandblasting operations.	Semivolatile organic compounds, volatile organic compounds	Groundwater Pump & Treat, Bioremediation of groundwater, Air sparging
IRP Site 8 - Runway Landfill	An approximately 4-acre grassy area located immediately west of Laguna Road, at the northeastern end of runway 9-27. It was used for trash burning and disposal of residential and shop wastes from the mid 1940s to 1952.	Semivolatile organic compounds, volatile organic compounds, pesticides, Polychlorinated Byphenyls	No action, limit access
IRP Site 9 - Main Base Fire Training Area	A 1.5 acre area containing an old 40-foot diameter, unlined fire burning pit located within 250 feet of the northwestern boundary of the base. The old fire pit was used from the late 1950s to 1984 for fire-fighting training exercises consisting of burning jet fuel and waste oil that were poured into the pit.	Pesticides, Polychlorinated Byphenyls, Dioxins and Furans	No action, limit access
IRP Site 24 - UST Sites 23 and 55	An area located in the industrial part of the base which consists of two former underground storage tank sites.	Chlorinated volatile organics	Groundwater Pump & Treat, Bioremediation of groundwater, Air sparging

BASESITE.DWG - 11/08/99 CHR 044-0273IRRID3



LEGEND

SITE 1	LAGOON LANDFILL
SITE 2	OLD SHOPS AREA
SITE 3	FUEL FARM
SITE 4	PUBLIC WORKS STORAGE YARD
SITE 5	OLD 6 AREA SHOPS
SITE 6	BUILDING 311 YARD
SITE 7	ELECTRIC SUBSTATION 680
SITE 8	RUNWAY LANDFILL
SITE 9	MAIN BASE FIRE TRAINING AREA
SITE 10	PCB CAPACITOR SPILL
SITE 11	MUGU LAGOON AND DRAINAGE DITCHES

1750' 0 1750' 3500'

SCALE: 1" = 3500'

NAWS POINT MUGU
CALIFORNIA

FIGURE 2-1

IR PROGRAM SITES

Department of Toxic Substances Control

Edwin F. Lowry, Director
5796 Corporate Avenue
Cypress, California 90630

Winston H. Hickox
Agency Secretary
California Environmental
Protection Agency

Gray Davis
Governor

February 7, 2000

FIELD(1)
FIELD(2)
FIELD(3)
FIELD(4)

REQUEST FOR APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR IRP SITES 1, 2, 4, 6, 8, 9, AND 24 AT NAVAL AIR WEAPONS STATION POINT MUGU, CALIFORNIA

The Department of Toxic Substances Control (DTSC) is overseeing site cleanup actions, pursuant to California Health and Safety Code Section 6.8 at Naval Air Weapons Station Point Mugu. Consequently, DTSC has the responsibility to contact state and local agencies and solicit these agencies' applicable or relevant and appropriate requirements (ARARs) for site cleanup activities at NAWS Point Mugu. DTSC has previously contacted you as a potential source of information on the potential presence of significant archeological or cultural resources regarding the Point Mugu area. Based on information provided by the Native American Heritage Commission, DTSC requests your input. DTSC hereby encourages you to identify any ARARs (chemical, location and action specific) for the remedial actions at Sites 1, 2, 4, 6, 8, 9, and 24.

ARARs are those legally applicable or relevant and appropriate standards, requirements, criteria or limitations of environmental laws defined in the CERCLA, Section 121 (d) (2) and as further defined in the National Contingency Plan (NCP), 40 CFR, Section 300. More information on ARARs is available at the U.S. Environmental Protection Agency Web Site at http://www.epa.gov/oerrpage/superfund/contacts/sfhotline/arar.pdf.

Pursuant to the NCP, the Navy is required to comply with all ARARs, i.e., laws and regulations promulgated by various agencies which specifically address the hazardous substance, pollutant, contaminants, removal/remedial action, location or other circumstance found at these sites. Please include the specific appropriate citation(s) of the statute, regulation, code, or rule that you have identified as an ARAR.
The ARARs will be utilized in the evaluation and determination of best technologies to treat the contamination at the above sites. Enclosed for your reference are a summary, a

map and a table containing a brief description of the sites, contaminants detected during previous investigations, and the remedial actions being considered by the Navy.

Your prompt identification of ARARs will ensure that the remedial actions are in compliance with California's laws and regulations. We appreciate your response to this request within 30 days of receipt of this letter. Please direct your response to Mr. Manny Alonzo at the above letterhead address.

We thank you in advance for your attention. If you have any questions, or would like to discuss this matter further, please contact Mr. Manny Alonzo at (714) 484-5425.

Sincerely,

Milasol C. Gaslan, P.E., Unit Chief
Federal Facilities Unit "A"
Office of Military Facilities

Enclosures (3)

Name	Street	City
Northern Chumash Council	P.O. Box 7164	Halcyon, California 93421
Ms. Peggy Odom	1339 24th Street	Oceano, California 93445
Mr. Gilbert M. Unzueta Jr.	9660 Sepulveda Blvd., Apt #11	North Hills, California 91343
Mr. John Ruiz	1826 Stanwood Drive	Santa Barbara, California 93103
Ms. Rosa Pace	P.O. Box 722	Solvang, California 93463
Ms. Mary E. Trejo	1500 13th Street	Los Osos, California 93402
Mr. John Sespe	P.O. Box 303	Pala Reservation, California 92059
Mr. Manuel Arrnenta	158 Kalawa Shuaq	Santa Ynez, California 93460
Ms. Ernestine DeSoto-McGovern	222 San Clements Street, #A	Ventura, California 93001
Ms. Beverly Salazar Folkes	1931 Shadybrook Drive	Thousand Oaks, California 91362
Ms. Melissa M. Para-Hernandez	119 N. Balsam Street	Oxnard, California 93030
Pilulaw Khus Zarate	2001 San Bernardo Creek Road	Morro Bay, California 93442
Mr. Steve Sun (Red Sun)	Star Route 1 Box 190A	Maricopa, California 93252
Redstar	2125 Channel Drive	Ventura, California 93001
Mr. Charles Cook	32835 Santiago Road	Acton, California 93510
Chief Joseph Ballesteros	Route 1, Box 91	Paso Robles, California 93446
Ms. Isabel Ayala	11108 Nardo Street	Saticoy, California 93004
Semu Huaute	P.O. Box 1836	Ojai, California 93024
Mr. Paul (Valenzuela) Varela	3290 Lang Ranch Parkway	Thousand Oaks, California 91362
Mr. Sal Perez	876 Olympia	Ventura, California 93004
Mr. Mark Steven Vigil	2700 Cinaga, Sp. #56	Oceano, California 93445
Candelaria American Indian Council	3203 E. Main Street	Ventura, California 93003
Mr. Richard Angulo	2841 Los Feliz Dr.	Thousand Oaks, California 91362
Ms. Jenny Mousseaux (Mclead)	P.O. Box 610546	San Jose, California 95161
Kl Nuah	P.O. Box 4033	Saticoy, California 93007
Ms. Julie Lynn Turnamait	365 N. Pole Avenue	Ojai, California 93023
Lei Lynn Odom	1339 24th Street	Oceano, California 93445
Mr. Patrick Tumamait	992 El Camino Corto	Ojai, California 93023
Mr. Dwayne Vigil	909 N. Walnut Drive	Santa Maria, California 93454

Name	Name2	Street	City
Owl Clan	Dr. Kote & Lin A-Lul'Koy Lotan	468 S. Evergreen Drive	Ventura, California 93003
Coastal Band of Chumash Indians	Mrs. Frances Franco	610 Del Monte Avenue	Santa Barbara, California 93101
Mr. Owl Clan	Qun-tan Shup	468 S. Evergreen Drive	Ventura, California 93003
Santa Ynez Band of Mission Indians	David Dominguez, Chairperson	P.O. Box 517	Santa Ynez, California 93460
San Fernando Mission Indians	Rudy Ortega	11640 Rincon Avenue	Sylmar, California 91342

ATTACHMENT E-3

ARARS SOLICITATION LETTERS
OTHER AGENCY RESPONSES (VARIOUS DATES)

California Integrated Waste Management Board

Dan Eaton, Chairman
8800 Cal Center Drive • Sacramento California 95826 • (916) 255-2200
www.ciwmb.ca.gov

Winston H. Hickox
Secretary for Environmental Protection

Gray Davis
Governor

February 9, 2000

Ms. Milasol C. Gaslan, P.E., Unit Chief
Federal Facilities Unit "A"
Office of Military Affairs
Department of Toxic Substances Control
5796 Corporate Avenue
Cypress, California 90630

Subject: Solicitation for Applicable or Relevant and Appropriate Requirements (ARARs) for IRP Sites 1, 2, 4, 6, 8, 9 and 24 at Naval Air Weapons Station Point Mugu, California

Dear Ms. Gaslan:

The Integrated Waste Management Board (IWMB) would like to thank-you for the opportunity to provide you with input for IWMB ARARs pertaining to landfill closure and postclosure maintenance activities. Based on the description of IRP sites 1, 2, 4, 6, 8, 9 and 24, landfill closure appears applicable only to sites 1 and 8. The California Integrated Waste Management Board ARARs are not applicable to sites 2, 4, 6, 9, and 24. Please find enclosed ARARs pertaining to landfill closure and postclosure maintenance and excavation and consolidation activities.

If you have any questions please contact me at (916) 255-3833.

Sincerely,

Scott S. Humpert

Scott S. Humpert, P.E.
Associate Waste Management Engineer
Permitting and Enforcement Division
California Integrated Waste Management Board

Enclosure:

S e ARARs for Solid Waste Disposa ite Excavation and Consolidation

Source	Standard, Requirement, Criterion, or Limitation	ARAR Status	Description	Comment	Associated Site
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20510(a) Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1, Sec. 20510(a), Disposal Site Operating Records	Applicable	Weight/Volume Records: the weight or volume of waste accepted must be determined to an accuracy of ±10%	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20510(b) Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1, Sec. 20510(b), Disposal Site Operating Records	Applicable	Excavation Records: records shall be maintained for excavations which may affect the safe and proper operation of the site or cause damage to adjoining properties.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20530 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1, Sec. 20530, Site Security	Applicable	Site Security: the site shall be designed to discourage unauthorized access by persons or vehicles by using a perimeter barrier or topographic constraints. Areas within the site where open storage or ponding of hazardous materials occurs shall be separately fenced.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20540 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1, Sec. 20540, Roads	Applicable	Roads: landfill roads must minimize dust and tracking of materials onto public roads. Such roads shall be kept in safe condition and maintained such that vehicle access and unloading can be conducted during inclement weather.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20630 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1, Sec. 20630, Confined Unloading	Applicable	Confined Unloading: unloading of solid wastes shall be confined to as small an area as possible without resulting in traffic, personnel or public safety hazards. Requires normal deposition of waste at toe of fill.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20640 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1, Sec. 20640, Spreading and Compacting	Applicable	Spreading and Compacting: Requires spreading and compacting of refuse in layers.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20650 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 4, Sec. 20650, Grading of Fill Surface	Applicable	Grading of Fill Surface: Covered surfaces of the disposal area shall be graded to promote run-off and prevent ponding, accounting for future settlement.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20660 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1, Sec. 20660, Stockpiling	Applicable	Stockpiling: Requires stockpiled cover material and unsuitable native materials to be placed so as not to cause problems or interference with site operations.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites

S .e ARARs for Solid Waste Disposa ,ite Excavation and Consolidation

Source	Standard, Requirement, Criterion, or Limitation	ARAR Status	Description	Comment	Associated Site
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20780(b) Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 4, Sec. 20780(b), Open Burning & Burning Wastes	Applicable	Burning Wastes: Burning wastes shall be extinguished.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20790 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1, Sec. 20790, Nuisance Control	Applicable	Leachate Control: The operator shall ensure that leachate is controlled to prevent contact with the public.	The state does not intend that subsurface leachate monitoring and collection systems need to be installed at existing sites unless there is evidence of leachate production and/or accumulation. Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20800 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 4, Sec. 20800, Dust Control	Applicable	Dust Control: The operator shall take adequate measures to minimize the creation of dust and prevent safety hazards due to obscured visibility.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20810 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 4, Sec. 20810, Dust Control	Applicable	Vector and Bird Control: The operator shall take adequate measures to control or prevent the propagation, harborage, or attraction of flies, rodents, or other vectors, and to minimize bird problems.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20820 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 4, Sec. 20820, Drainage and Erosion Control	Applicable	Drainage And Erosion Control: The drainage system shall be designed and maintained to: ensure integrity of roads, structures, and gas monitoring and control systems; prevent safety hazards; and prevent exposure of waste.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20830 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 4, Sec. 20830, Grading of Fill Surface	Applicable	Litter Control: Litter and loose materials shall be routinely collected and disposed of properly	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20919 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 6, Sec. 20919, Gas Control	Applicable	Gas Control: The operator shall cause the site to be monitored for the presence and movement of landfill gas and take any necessary action to control such gases in the event that the gas causes a hazard or nuisance.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 21600 Div. 2, Subdiv. 1, Ch. 4, Subch. 3, Art. 2, Sec. 21600, Report of Disposal Site Info	Relevant and Appropriate	Report of Disposal Site Information: The planning and procedural requirements necessary to ensure that solid waste is handled and disposed in manners that protect public health and safety and the environment must be conducted.	Applies to operating solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation sites

14 CCR - California Code of Regulations, Title 14 ARAR - applicable or relevant and appropriate requirement ROD - Record of Decision RD/RA - remedial design/remedial action

RESOURCE MANAGEMENT AGENCY

'ounty of ventura

Environmental Health Division
Donald W. Koepp
Director

February 15, 2000

Manny Alonzo
Department of Toxic Substances Control
5796 Corporate Avenue
Cypress, CA. 90630

NAVAL AIR WEAPONS STATION POINT MUGU
LOCAL AGENCY APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

The Ventura County Environmental Health Division has reviewed your February 3, 2000 correspondence and has the following comments regarding local applicable requirements:

: lett

The Ventura County Environmental Health Division will only require that the operations at the facility comply with all regulatory requirements for programs under the jurisdiction of the Ventura County Certified Unified Program Agency (CUPA) (hazardous wastes, on-site treatment of hazardous wastes, underground storage of hazardous materials, hazardous materials inventory, and Spill Prevention Control and Counter Measures).

The Ventura County CUPA has issued a Ventura County Hazardous Materials permit to this facility per the Ventura County Ordinance Code.

If you have any questions, please contact Gregory Smith at 805/654-2823 or Rick Bandelin at 805/654-3522.

Gregory R. Smith

GREGORY R. SMITH
SUPERVISING HAZARDOUS MATERIALS SPECIALIST
ENVIRONMENTAL HEALTH DIVISION

GS:pricep>hazmat\muguarar.doc

800 South Victoria Avenue, Ventura, CA 93009-1730 (805) 654-2813 FAX (805) 654-2480
Internet Web Site Address: www.ventura.org/env_hlth/env.htm

Ventura County Air Pollution Control District

669 County Square Drive
Ventura, California 93003

tel 805/645-1400
fax 805/645-1444

Richard H. Baldwin
Air Pollution Control Officer

March 14, 2000

Milasol C. Gaslan
Unit Chief
Office of Military Facilities
Department of Toxic substances Control
5796 Corporate Avenue
Cypress, CA 90630

RE: Applicable or Relevant and Appropriate Requirements -
Naval Air Weapons Station, Point Mugu

This is in response to your letter of February 3, 2000 to Mr. Richard H. Baldwin. I apologize for the lateness of this response. The Ventura County Air Pollution Control District is responsible for permitting and regulating those activities at the Naval Air Weapons Station, Point Mugu, which generate air emissions. In regards to the remediation activities proposed at NAWS, Point Mugu, detailed in your letter, the pumping and treating of groundwater that is contaminated with volatile organics may be subject to the Air Pollution Control District's permit requirements (APCD Rule 10 - see copy attached). If such activity is subject to the District's permit requirements, an Authority to Construct must be obtained prior to beginning construction of any regulated equipment and a Permit to Operate must be obtained prior to operation of the equipment. Questions regarding the District's permit requirements should be directed to Mr. Kerby Zozula, Supervisor of the District's Permit Section, at 805/645-1421.

Sincerely,

Keith Duval, Manager
Compliance and Employer Transportation Program Division

C: Kerby Zozula, APCD
Engineering Division

printed on recycled paper

Office of Environmental Health Hazard Assessment

Joan E. Denton, Ph.D., Director
Headquarters • 301 Capitol Mall, Rm. 205 • Sacramento, California 95814-4308
Oakland Office • Mailing Address: 1515 Clay Street, 16th Floor • Oakland, California 94612

Winston H. Hickox
Agency Secretary

Gray Davis
Governor

MEMORANDUM

TO: Milasol C. Gaslan, P.E., Unit Chief
Department of Toxic Substances Control
Federal Facilities Unit A
5796 Corporate Avenue
Cypress, California 90630

FROM: David M. Siegel, Ph.D., Chief
Hazardous Waste Toxicology Section

DATE: March 3, 2000

SUBJECT: SOLICITATION FOR APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS) FOR IRP SITES 1,2,4,6,8,9 AND 24 AT NAVAL AIR WEAPONS STATION POINT MUGU, CALIFORNIA

This memorandum is in response to a February 3, 2000 letter to Mr. Allan Hirsh of the Office of Environmental Health Hazard Assessment (OEHHA) requesting that OEHHA identify potential chemical, location, and action-specific ARARs for site cleanup activities at NAS Point Mugu. A site summary, contaminants detected during site investigations, and possible remedial actions were enclosed.

OEHHA has developed chemical-specific toxicity values in several programs that may be relevant to the cleanup of the Point Mugu site. The California Safe Drinking Water Act of 1996 (amended Health and Safety Code, Section 116365) requires OEHHA to adopt *Public Health Goals*, or estimates of contaminant levels in drinking water that would pose no significant health risk to individuals consuming water on a daily basis over a lifetime. PHGs adopted by OEHHA are for use by the California Department of Health Services in establishing primary drinking water standards (State Maximum Contaminant Levels, or MCLs). PHGs are described and values posted on the OEHHA website at www.oehha.ca.gov/water/phg/index.html.

In response to Senate Bill 1731 (Stats. 1992, Ch.1162), OEHHA has developed risk assessment guidelines for implementing the Air Toxics "Hot Spots" Information and Assessment Act of 1987. In conjunction with these guidelines, OEHHA has generated acute and chronic reference exposure levels, or *RELs*, that are used for assessing noncancer risks within the risk assessment process. An REL is defined as the concentration at or below which no adverse health

effects are anticipated in the human population. RELs are described and values posted on the OEHHA website at www.oehha.ca.gov/air/hot_spots/index.html.

Proposition 65, formally known as the Safe Drinking Water and Toxic Enforcement Act of 1986, is intended to protect California citizens and the State's drinking water sources from chemicals known to cause cancer or reproductive harm, and to warn the citizens about exposures to such chemicals. Warnings are not required and discharges into sources of drinking water are not prohibited if the business responsible for the exposure or discharge is able to demonstrate that the exposure or discharge poses "no significant risk" of cancer or no observable adverse effect on reproduction. Chemical-specific daily intake levels representing the "no significant risk" levels (NSRLs) and the reproductive "maximum allowable daily dose levels" (MADLs) are established by OEHHA in regulation to assist the regulated community in determining whether exposures or discharges for which they are responsible are exempt. NSRLs and MADLs are described and listed in Title 22 California Code of Regulations (CCR), Sections 12705 and 12805, respectively, and are posted on the OEHHA website at www.oehha.ca.gov/prop65/pdf/tb0194r2.pdf. CCR Section 12711 describes alternative levels of exposure that may meet the requirements of a NSRL.

The Cal/EPA Risk Assessment Coordination Work Group has compiled a list of cancer potency factors developed or approved by OEHHA, the Department of Pesticide Regulation, and the Department of Toxic Substances Control. These cancer potency factors have been used as a basis for regulatory actions and are used in a variety of risk assessment scenarios (e.g., CERCLA/RCRA programs). The cancer potency factors are included in the Toxicity Criteria Database and posted on the OEHHA website at http://www.oehha.ca.gov/risk/chemicalDB/index.asp.

If you have any questions about this matter, please call me at (916) 324-2829.

cc: Allan Hirsh, Deputy Director, External and Legislative Affairs
Colleen Heck, Chief Council OEHHA

STATE OF CALIFORNIA – THE RESOURCES AGENCY

GRAY DAVIS, *Governor*

CALIFORNIA COASTAL COMMISSION
45 FREMONT STREET, SUITE 2000
SAN FRANCISCO, CA 94105-2219
AND TDD (415) 904-5200

February 7, 2000

Manny Alonzo
Edwon F. Lowry, Directgor
Department of Toxic Substances Control
5796 Corporate Ave.
Cypress, CA 90630

Attn: Manny Alonzo

Re: ARARs, Naval Air Weapons Station, Point Mugu

Dear Mr. Alonzo:

This is in response to your letter of February 3, 2000, in which you request ARARs applicable to remediation efforts at Sites 1,2,4,6,8,9 and 24 at the Naval Air Weapons Station (NAWS) in Point Mugu. To clarify applicable Coastal Commission authority, please note the provisions of Section 307 of the federal Coastal Zone Management Act (CZMA) (16 U.S.C. Section 1456, with implementing regulations at 15 CFR Part 930). The CZMA requires that activities on federal land, such as Navy cleanup operations at NAWS, that have the potential to affect the coastal zone may trigger the need for a consistency or negative determination, depending on the potential impact of any particular cleanup activity. We do not have specific (i.e., chemical, location and action specific) requirements; rather our requirements are more general in nature, both procedurally and substantively. Procedurally, we ask that you coordinate the cleanup activities with us to determine whether a consistency or negative determination is needed. Substantively, any requirements that cleanup projects would need to be consistent with are those found in Chapter 3 of the Coastal Act (see attachment for most likely applicable policies).

Please note that if a consistency determination needs to be submitted for this activity, it should include a finding as to whether the project is consistent to the maximum extent practicable with the California Coastal Management Program and the necessary information to support that conclusion, including an analysis of the project's consistency with Chapter 3 of the Coastal Act. (See CFR Section 930.39 for a full listing of the information required for a complete consistency determination.) If you have any questions about the need for or preparation of a consistency or negative determination, please contact James Raives, federal consistency coordinator for the Commission staff, at (415) 904-5289.

Sincerely,

MARK DELAPLAINE
Federal Consistency Supervisor

CC: Ventura Area Office
Jim Danza, U.S. Navy
James Raives

City of
Oxnard

February 24, 2000

CERTIFIED MAIL
Z 381 516 260

Mr. Manny Alonzo
DEPARTMENT OF TOXIC SUBSTANCES CONTROL
5796 Corporate Avenue
Cypress, CA 90630

Subject: Applicable or Relevant and Appropriate Requirements for Naval Air Weapons Station, Point Mugu

Dear Mr. Alonzo:

In response to the February 3, 2000 letter from Ms. Milasol Gaslan requesting ARAR's for the aforementioned site, I am forwarding a copy of the City of Oxnard Wastewater Ordinance 2494 governing discharge into the Municipal Wastewater Collection System which includes local wastewater limitations. In addition, enclosed is a copy of the City of Oxnard Wastewater Ordinance 2450 related to storm water quality management.

I hope this information is helpful to you. Please call me at (805) 271-2220 if you have any questions or if you require additional information.

Sincerely,

Sally Coleman
Technical Services Manager

SC:js
wp/a:letters/arars-naws

Enclosures

Wastewater Division
6001 S. Perkins Road • Oxnard, CA 93033 • (805) 488-3517 • Fax (805) 488-2036

ATTACHMENT E-4

ARARS SOLICITATION LETTERS
DTSC TO NAVY (MARCH 27, 2000)

BASE COPY

Department of Toxic Substances Control

Edwin F. Lowry, Director
5796 Corporate Avenue
Cypress, California 90630

N63126.000663
NBVC PT. MUGU
SSIC No. 5090.3

Winston H. Hickox
Agency Secretary
California Environmental
Protection Agency

Gray Davis
Governor

March 27, 2000

Mr. Donald E. Ringel
Desert Environmental Team Leader
Southwest Division Naval Facilities
Engineering Command (Code 5DEN)
1220 Pacific Avenue,
San Diego, California 92132-5190

IDENTIFICATION OF STATE APPLICABLE AND RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS) FOR SITES 1, 2, 4, 6, 8, 9, AND 24 AT NAVAL AIR WEAPONS STATION POINT MUGU

Dear Mr. Ringel:

The Department of Toxic Substances Control (DTSC) received your letter on the above subject on January 20, 2000. DTSC subsequently sent letters to state and local agencies requesting their input. DTSC also sent letters to individuals and organizations previously identified as potential sources of information on the potential presence of significant archeological or cultural resources regarding the Point Mugu Area. Samples of the letters and the addresses are enclosed. Also, enclosed are copies of the responses from some of the parties who responded in writing. It is now the responsibility of the Department of the Navy to follow up with the agencies that have not responded whether they have ARARs for the proposed project at these sites.

To assist other agencies in their preliminary identification of ARARs, DTSC prepared a table of potential remedial alternatives based on a conversation with Mr. Steve Granade. Although we felt that there is not enough information to respond to your request in the fashion described in your letter, we felt that requesting the input of other agencies was warranted at this time in order to promote early identification. We consider the ARARs identified at this point to be very preliminary. The information you requested in the bullets 1 to 4 of your letter would have been possible to provide if more information was available on screening of potential remedial alternatives for each site.

From our preliminary review of the tables enclosed with your letter, we believe that you have identified almost all the potential ARARs. However, we do not necessarily agree with all the Navy's ARARs determination and comments. Further, without a screening of potential remedial alternatives under consideration by the DoN, it is premature to evaluate the applicability or relevance and appropriateness of the requirements listed

on those tables in the ARAR determination and comments columns. Those lists of ARARs need to be reevaluated in the context of the Feasibility Study (FS) for those sites. We look forward to discussing the ARARs when the FS is submitted for review and comment.

Although DTSC may coordinate responses from state and local agencies, it is DoN's responsibility as the lead project proponent to discuss its determination of applicability or relevance and appropriateness, stringentcy, rational, and intent of the requirements with other agencies. DTSC will be responsible for ARARs that it has been designated to administer.

If you have any questions, please contact me at (714) 484-5425.

Sincerely,

Manuel J. Alonzo

Manny Alonzo
Project Manager
Federal Facilities Unit A
Office of Military Facilities

Enclosures

cc: Mr. Peter Raftery (w/o enclosures)
Regional Water Quality Control Board
Region 4
320 West 4th Street, Suite 200
Los Angeles, California 90013

Mr. Steve Granade (w/o enclosures)
Naval Air Weapons Station Point Mugu
521 9th Street
Point Mugu, California 93042-5001

Mr. Scott Flint (w/o enclosures)
California Dept. of Fish and Game
1700 K Street, Suite 250
Sacramento, CA 95814

ATTACHMENT E-5

ARARS DETERMINATION LETTER
NAVY TO DTSC (MAY 31, 2002)

DEPARTMENT OF THE NAVY
SOUTHWEST DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132-5190

5090
Ser 5DEN.MG/2070
May 31, 2002

Mr. Quang Than
California Environmental Protection Agency
Department of Toxic Substances Control
5796 Corporate Avenue
Cypress, California 90630-4732

Dear Mr. Than:

Subject: REGULATORY REVIEW OF NBVC POINT MUGU INSTALLATION RESTORATION PROGRAM (IRP) SITE 1 LANDFILL REVISED FEASIBILITY STUDY

This letter is a follow-up to the meeting held at your offices on May 9, 2002 regarding the Naval Base Ventura County (NBVC) Point Mugu IRP Site 1 landfill revised feasibility study (FS). A final discussion of these issues with the agencies is requested and a date will be proposed by the Navy. Discussed below are specific solid waste landfill requirements that are proposed applicable or relevant and appropriate requirements (ARAR) for Site 1. Attachment A contains a review of the regulatory aspects of the revised FS approach that was presented in a slide show at the meeting of May 9.

The Navy will submit a revised FS that will evaluate appropriate remedial alternatives for Site 1. The Navy has found that Site 1 ceased operation as a landfill and was closed in 1975. Based on the Navy's research, Title 23 of the California Code of Regulations (CCR), Section 2535 was adopted in 1972 and addresses completion of disposal operations. Site 1 was closed in a manner that met those closure requirements. Under that set of requirements, the Navy has continuous responsibility to assure protection from gases and leachate, and protection of usable surface water and groundwater and their quality; specific cover requirements, however, are absent.

This finding is also consistent with the draft closed, inactive, and abandoned (CIA) sites guidance being developed by California Integrated Waste Management Board (IWMB), which is based on the lead enforcement agency (LEA) advisory dated June 10, 1993 (rescinded January 15, 2002). The original advisory and the draft guidance specifically address appropriate actions for sites that were never closed under Title 14, Article 7.8, Disposal Site Standards Closure and Post closure (Sections 17760 through 17796). The LEA advisory stated that for sites that last received waste prior to 1976, no set requirements existed at the state level, although there may have been local closure requirements. There are no local closure requirements imposed by the County of Ventura. However, the Regional Water Quality Control Board can enforce appropriate portions of the 1984 Title 14, Chapter 15 (Section 20950(a)) regulations if the site poses a threat to water quality. No threat to water quality from Site 1 has been identified. Data collected from Site 1 and the receiving water at Site 11 confirm this.

The ARARs for Site 1 are listed below by regulatory category.

Federal Location-Specific

Executive Order 1198, Protection of Floodplains

Coastal Zone Management Act, Section 307

Migratory Bird Treaty of 1972, 16 USC Section 703 5090

State Water Resources Control Board and Regional Water Quality Control Board, Comprehensive Water Quality Plan for the Los Angeles Basin

State Location-Specific

Fish and Game Code, Fish and Game Code Section 2080

California Coastal Act of 1976, Public Resources Code Sections 30000 – 30900

State Action-Specific

Pertinent sections of Title 27, CCR relating to groundwater monitoring, cover maintenance, and requirements for CIA sites.

Ventura County Pollution Control District Rule 403

If you have any questions or comments, please call me at (619) 532-3178.

Sincerely,

MICHAEL J. GONZALES
Remedial Project Manager, SWDIV
By direction of the Commander

Enclosure : 1. A. REVIEW OF HISTORICAL SOLID WASTE REGULATIONS.

Copy to:
Steve Granade, NBVC
Kathryn Norris, Tetra Tech
Tom Keeney, NBVC
John Christopher, Ph.D., DTSC
Marie McCrink, DTSC
Patty Velez, DF&G
Diane Noda, USFWS
Peter Raftery, LA RWQCB

Copy to:

Steve Granade 1 copy
Naval Base Ventura County, Point Mugu
Environmental Division Code 833210E
Trailer 10073
Corner of 12th & Laguna Rd.
Point Mugu, CA 93042-5001

Tom Keeney 1 copy
Naval Base Ventura County, Point Mugu
Environmental Division Code 833210E
Trailer 10073
Corner of 12th & Laguna Rd.
Point Mugu, CA 93042-5001

John Christopher, Ph.D. 1 copy
Department of Toxics Substances Control
301 Capital Mall 3rd Floor
Sacramento, CA 95812-0806

Manny Alonzo 1 copy
Department of Toxic Substances Control
5796 Corporate Ave.
Cypress, CA 90630

Marie McCrink 1 copy
Department of Toxic Substances Control
8880 California Center Drive
Sacramento, CA 95826

Patty Velez 1 copy
California Department of Fish & Game
Marine region
20 Lower Ragsdale Rd., Suite 100
Monterey, CA 93940

Diane Noda 2 copies
Field Supervisor
U.S. Fish & Wildlife Service
2493 Portola Road Suite B
Ventura, CA 93033

Peter Raftery 1 copy
Regional Water Quality Control Board Region 4
320 West 4th Street
Suite 200
Los Angeles, CA 90013

ATTACHMENT A

REVIEW OF HISTORICAL SOLID WASTE REGULATIONS

HISTORICAL SOLID WASTE REGULATIONS

Federal Solid Waste Laws and Regulations

The first federal law relating to solid waste was the Solid Waste Disposal Act of 1965. The Resource Conservation and Recovery Act (RCRA), which concerned hazardous waste, was passed in 1976 as a series of amendments to the Solid Waste Disposal Act. The Hazardous and Solid Waste Amendments (HSWA) of 1984 significantly expanded the scope of RCRA by adding new corrective action requirements, land disposal restrictions, and technical requirements.

The first federal hazardous waste regulations adopted pursuant to RCRA became effective in 1980. Federal solid waste management requirements found in Title 40 of the Code of Federal Regulations (40 CFR), Part 258, became effective in October of 1993.

State of California Solid Waste Laws and Regulations

In California, several agencies have historically had overlapping authority for landfills. These agencies were the Integrated Waste Management Board (IWMB) and its predecessors, the State Water Resources Control Board (SWRCB) and regional boards, and for hazardous waste, the Department of Toxic Substances Control (DTSC). The focus in this discussion is on IWMB and SWRCB authority over solid waste landfills. Hazardous waste regulations are not included.

California Integrated Waste Management Board

The California State Legislature passed the Nejedly-Z'berg-Dills Solid Waste Management and Resource Recovery Act in 1972, which created the State Solid Waste Management Board, later named the California Waste Management Board. The statute gave the board broad authority to develop standards for solid waste handling, disposal, and reclamation. The board developed minimum standards in 1975 for solid waste handling and disposal, but was not given enforcement authority until the Z'berg-Kapiloff Solid Waste Control Act of 1976 was passed. That Act mandated the designation of enforcement agencies within each county to enforce solid waste regulations under the supervision of the board.

The Integrated Waste Management Act of 1989 created and gave authority to the IWMB, which replaced the California Waste Management Board. The Solid Waste Disposal Regulatory Reform Act of 1993 required the IWMB (and the SWRCB described below) to adopt a consolidated set of solid waste disposal regulations. These regulations were adopted in 1997 and appear in Title 27 of the California Code of Regulations (CCR). These are the current state regulations governing landfill solid waste operations.

State Water Resources Control Board

The Dickey Water Pollution Act of 1949 created the State Water Pollution Control Board and the SWRCB. The act also established the regional water pollution control boards. In 1967, the two agencies were incorporated into one SWRCB, along with nine Regional Water Quality Control Boards (RWQCB).

The key piece of legislation relating to water quality in California is the Porter-Cologne Water Quality Control Act of 1969.

Key State Regulations Pertaining to Solid Waste Landfill Closure

Pre-1975

The SWRCB adopted the first set of regulations in 1972 concerning waste disposal sites. Subchapter 15 of 23 CCR, Section 2535, Completion of Disposal Operations, contained the following requirements for closure of disposal sites:

Prior to cessation of disposal operations at a waste disposal site, the operator shall submit a technical report to the appropriate regional board describing the methods and controls to be used to assure protection of the quality of surface and groundwaters of the area during final operations and with any proposed subsequent use of the land. . . .

The methods used to close a site and assure continuous protection of the quality of surface and groundwater shall comply with waste discharge requirements established by the regional board.

The owner of the waste disposal site shall have a continuing responsibility to assure protection of usable waters from the waste discharger, and from gases and leachate that are caused by infiltration of precipitation or drainage waters into the waste disposal areas or by infiltration of water applied to the waste disposal areas during subsequent use of the property for other purposes.

1975 - 1979

The California Waste Management Board adopted regulations in 1975 containing disposal site standards. These were found in Chapter 3, Article 7 of California Code of Regulations (CCR) Title 14, Sections 17601-17774. Section 17601, titled "Applicability of Standards," pertaining specifically to the Article 7 Disposal Site Standards, provides as follows:

These standards shall be in force for disposal sites . . . receiving Group 2 wastes (wastes which contain chemically or biologically decomposable material, but which do not include toxic substances nor those capable of significantly impairing the quality of usable waters) which are in operation on or after July 1, 1976 or prior to that date if provided in the county solid waste management plan develop and approved pursuant to Section 66780 of the Government Code.

As the section indicates, the regulations applied to sites operating after July of 1976. Furthermore, as previously noted, the IWMB was not given enforcement authority until 1976. These regulations included closure requirements for the final site face, final cover, leachate control, grading of fill surfaces, and site maintenance.

1980 - 1984

Subchapter 15 of CCR Title 23 was amended in 1980 and again in 1984. In the 1980 amendments, Sections 2553, 2553.1, and 2553.2 concerned disposal operations. Section 2553(a) required an operator to submit a site closure and maintenance report if required to do so by the RWQCB.

The 1984 amendments contained landfill closure requirements at CCR Title 23 Section 2581, consisting of cover requirements, grading requirements, and long-term maintenance requirements. Section 2580 simply required that waste management units be closed in accordance with an approved closure and post closure maintenance plan.

1985 - Present

The current set of regulations in Title 27 of the CCR went into effect in 1997, and were intended as a consolidation of the IWMB's Title 14 regulations and the SWRCB's Title 23 regulations. The IWMB portion of the regulations define a closed site as "a disposal site that has ceased accepting waste and was closed in accordance with applicable statutes, regulations, and local ordinances in effect at the time" (27 CCR 20164). The SWRCB components of the regulations contain requirements for closed, abandoned, and inactive (CAI) units: "waste management units that were closed, abandoned, or inactive prior to November 27, 1984" (27 CCR 20164). Title 27 of the CCR, Section 20950(a)(1) states that no cover modification is required for units closed in accordance with an approved closure plan prior to November 27, 1984, if the unit poses no threat to public health and safety or the environment, or is not a significant nuisance, unless monitoring data indicate impairment of groundwater beneficial uses.

ATTACHMENT E-6

ARARS DETERMINATION LETTER
DTSC TO NAVY (JANUARY 21, 2003)

Department of Toxic Substances Control

Edwin F. Lowry, Director
5796 Corporate Avenue
Cypress, California 90630

Winston H. Hickox
Agency Secretary
California Environmental
Protection Agency

Gray Davis
Governor

January 21, 2003

Michael Gonzales
Remedial Project Manager, Code 5DEN.MG
Naval Facilities Engineering Command
Southwest Division
1220 Pacific Highway
San Diego, California 92132-5190

APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS) FOR REMEDIATION OF SOIL AND GROUNDWATER ASSOCIATED WITH INSTALLATION RESTORATION PROGRAM SITE 1 – NAVAL BASE VENTURA COUNTY POINT MUGU

Dear Mr. Gonzales:

This letter transmits the potential State ARARs the Navy requested. These ARARs are to be considered in the preparation of the Revised Feasibility Study (FS) for the subject site. The Enclosures present the ARARs in the following manner:

- Enclosure 1: Los Angeles Regional Water Quality Control Board
- Enclosure 2: California Department of Fish and Game
- Enclosure 3: California Coastal Commission
- Enclosure 4: Ventura County Air Pollution Control District
- Enclosure 5: California Integrated Waste Management Board
- Enclosure 6: Department of Toxic Substances Control

The ARAR analysis is an iterative process. As the remedial alternatives are more fully developed in the FS, certain ARARs may no longer apply or additional ARARs may become apparent.

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our Web-site at www.dtsc.ca.gov.

Printed on Recycled Paper

If you have any questions regarding this matter, please contact me at (714) 484-5352.

Sincerely,

Quang Than
Remedial Project Manager
Office of Military Facilities
Southern California Branch

Enclosures

cc: Steve Granade
Environmental Division, Code N45V
Naval Base Ventura County
311 Main Road, Suite 1
Point Mugu, California 93042-5001

Peter Raftery, C.HG.
California Regional Water Quality Control Board
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, California 90013

Patty Velez
Scientific Branch–Resource Assessment
Office of Spill Prevention and Response
California Department of Fish and Game
20 Lower Ragsdale, Suite 100
Monterey, California 93940

Mark Delaplaine
Office of Federal Consistency
California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, California 94105-2219

cc: Kerby Zozula
Engineering Division
Ventura County Air Pollution Control District
669 County Square Drive
Ventura, California 93003

Scott Humpert, P.E.
Permitting and Enforcement Division
California Integrated Waste Management Board
1001 I Street
Sacramento, California 95812-4025

Emad Yemut, P.E.
Federal Facilities Unit A
Office of Military Facilities
Department of Toxic Substances Control
Cypress Office

ENCLOSURE 1

California Regional Water Quality Control Board

Los Angeles Region

Winston H. Hickox
Secretary for Environmental Protection

Over 50 Years Serving Coastal Los Angeles and Ventura Counties
Recipient of the 2001 *Environmental Leadership Award* from Keep California Beautiful

Gray Davis
Governor

320 W. 4th Street, Suite 200, Los Angeles, California 90013
Phone (213) 576-6600 FAX (213) 576-6640
Internet Address: http://www.swrcb.ca.gov/rwqcb4

December 16, 2002

Mr. Quang Than
California Environmental Protection Agency
Department of Toxic Substances Control
Office of Military Facilities
5796 Corporate Avenue
Cypress, CA 90630

ARARS FOR INVESTIGATION RESTORATION SITE 1 - NAVAL BASE VENTURA COUNTY, POINT MUGU, CALIFORNIA (SLIC NO. 282, PCA NO. 16632)

Dear Mr. Than:

Los Angeles Regional Water Quality Control Board (Regional Board) staff are responding to your request for Applicable or Relevant and Appropriate Requirements (ARARs) for the Lagoon Landfill (Site 1). Please see the attached memorandum from our legal council.

If you have any questions regarding this information, please contact me at (213) 576-6796.

Sincerely,

Peter Raftery

Peter J. Raftery, C Hg
Associate Engineering Geologist
Site Cleanup Unit I

cc: Michael Gonzales, Department of Navy, Southwest Division w/ attachment

attachment: Memo from Michael Lauffer, SWRCB

S:\SLIC\PJR\PMUGU\mugu plating waste pits IR site 5\site 1 arars cover letter dec02.doc

******The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption******
******For a list of simple ways to reduce demand and cut your energy costs, see the tips at: http://www.swrcb.ca.gov/news/echallenge.html******

Recycled Paper

Our mission is to preserve and enhance the quality of California's water resources for the benefit of present and future generations.

State Water Resources Control Board

Winston H. Hickox
Secretary for Environmental Protection

Office of Chief Counsel
1001 I Street, 22nd Floor, Sacramento, California 95814
P.O. Box 100, Sacramento, California 95812-0100
(916) 341-5161 ♦ FAX (916) 341-5199 ♦ www.swrcb.ca.gov

Gray Davis
Governor

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website at www.swrcb.ca.gov.

TO: Peter Raftery
California Regional Water Quality Control Board,
Los Angeles Region

FROM: Michael A.M. Lauffer
Staff Counsel
OFFICE OF CHIEF COUNSEL

DATE: December 16, 2002

SUBJECT: Applicable or Relevant and Appropriate Requirements (ARARs) for Point Mugu Navy Base Lagoon Landfill (IR Site 1)

Introduction

You have requested a list of potential Regional Board ARARs to be considered as remedial activities are contemplated for the Point Mugu Navy Base Lagoon Landfill (IR Site 1, hereinafter Facility). Pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. § 9601 *et seq.*, hereinafter CERCLA), remedial actions at sites subject to CERCLA must attain ARARs. ARARs include state requirements governing water quality, including both surface and ground waters.

The following list identifies water quality-related ARARs over which the California Regional Water Quality Control Board, Los Angeles Region (Regional Board) has jurisdiction. In other words, it addresses only those ARARs to be proposed by the Regional Board. Other state agencies may have other state requirements that should be incorporated as ARARs. Further, this list of water quality-related ARARs is intended to provide a comprehensive review of potential ARARs, but as investigations continue it may be possible to remove or to add ARARs based on a subsequent determination of applicability.

Finally, the accompanying list is intended to identify the sources of ARARs that the U.S. Navy will need to consult as it develops investigation, feasibility, and remedial documents for the Facility. Some of the ARARs will require careful consideration of identified constituents of concerns with reference to tables referenced in the ARARs. For example, Basin Plan at page 3-18 requires that groundwater designated for domestic or municipal supply shall not contain concentrations of chemical constituents and radionuclides in excess of the limits specified in

cited provisions of Title 22 of the California Code of Regulations. The numeric ARAR can only be determined by reference to the Title 22 regulations which are not reproduced here.

List of ARARs

- **Porter-Cologne Water Quality Control Act (California Water Code, Division 7 [commencing with section 13000, hereinafter Porter-Cologne Act])**
  The Water Code authorizes the State Water Resources Control Board and the Regional Board to establish in Water Quality Control Plans beneficial uses and numerical and narrative standards to protect both surface and ground water quality. The Porter-Cologne Act authorizes the Regional Board to issue permits for discharges to land or surface or ground water that could affect water quality, including NPDES permits, and to take enforcement action to protect water quality. Implemented through regulations (Title 23, Divisions 3 and 4, California Code of Regulations), plans, policies and guidelines.

  Besides enabling other more specific ARARs, the Porter-Cologne Act establishes applicable and enforceable requirements. Among potential ARARs are: California Water Code sections 13000, 13050, 13142.5, 13170.2, 13172, 13173, 13173.2, 13176, 13240, 13241, 13242, 13243, 13260, 13263, 13263.2, 13263.2, 13267, 13271, 13272, 13273, 13273.1, 13273.2, 13273.3, 13304, 13304.1, 13374, 13375, 13376, 13377, 13381, 13382, and 13383.

- **Regional Water Quality Control Plan, Los Angeles Region: Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties (Basin Plan)**
  The Basin Plan contains beneficial uses and water quality objectives for the protection of those uses for waters of the state, including ground and surface waters, in the Los Angeles region. Beneficial uses for ground and surface waters in the vicinity of Point Magu are identified in Chapter 2 of the Basin Plan.

  Objectives to protect those uses are specified in Chapter 3 of the Basin Plan. To the extent surface waters are impacted by discharges from the Facility, surface water objectives contained at pages 3-3 through 3-17 of the Basin Plan are ARARs. Similarly, to the extent wetlands may be impacted by discharges from the Facility, wetland objectives specified at page 3-17 of the Basin Plan are ARARs. Groundwater objectives are identified at pages 3-17 through 3-19 of the Basin Plan and constitute ARARs for the facility.

  Programs for implementing remedial activities are specified in Chapter 4 of Basin Plan at pages 4-57 through 4-63. These program elements are ARARs for the facility.

- **State Water Resources Control Board (State Board) Resolution No. 92-49**
  Resolution No. 92-49 specifies the state's requirements for investigation and cleanup and abatement of discharges or threatened discharges. It is legally enforceable and of general

applicability. It applies to all discharges of waste to waters of the state or discharges that threaten waters of the state.

- **State Board Resolution No. 68-16**
  Resolution No. 68-16 specifies as a regulatory requirement the state's policy of maintaining the high quality of waters. It applies to the discharge of treated ground water as well as in situ cleanup levels for impacted ground water.

- **State Board Resolution No. 88-63**
  Resolution No. 88-63 ("Sources of Drinking Water Policy") as contained in the Basin Plan specifies that, with certain exceptions, all ground and surface waters have the beneficial use of municipal or domestic water supply. This policy was properly promulgated and is of general applicability.

- **Title 23 California Code of Regulations, Division 3, Chapter 15 (Discharges of waste to land, commencing with section 2510)**
  Chapter 15 regulates the siting, design, construction, operation, closure, and monitoring (including corrective action) of waste discharges to land for treatment, storage, or disposal, including landfills, surface impoundments, waste piles, and land treatment facilities. Wastes regulated include "hazardous waste," "designated waste," "nonhazardous solid waste", and "inert waste".

- **Title 27 California Code of Regulations, Division 2, (Solid waste, commencing with section 20005)**
  Division 2 is a companion to Chapter 15 discussed above and contains further requirements for siting, design, construction, operation, closure, and monitoring (including corrective action) of waste discharges to land for treatment, storage, or disposal, including landfills, surface impoundments, waste piles, and land treatment facilities

- **Toxic Pits Cleanup Act (TPCA) (California Health and Safety Code § 25208, *et seq.*)**
  TPCA authorizes the Regional Water Boards to regulate surface impoundments containing hazardous waste as defined in Title 22, California Code of Regulations, prohibits discharges to such surface impoundments unless they meet specified siting and design requirements. It further requires compliance with specific investigation, remediation, and reporting requirements.

- **Safe Drinking and Toxic Enforcement Act of 1986 (Proposition. 65) (California Health and Safety Code, Division 20, Chapter 6.6 [commencing with section 25249.5])**
  Proposition 65 prohibits the discharge of known human carcinogens or reproductive toxins to sources of drinking water or on land where and. it could pass into a source of drinking water. Chemicals and applicable regulatory levels are listed at Title 22, California Code of Regulations section 12000, et seq.

ENCLOSURE 2

State of California

Memorandum

To: Mr. Quang Than
Project Manager
California Environmental Protection Agency
Department of Toxic Substances Control
Office of Military Facilities
5796 Corporate Avenue
Cypress, California 90630-4732

Date: November 25, 2002

From: Patty Velez
California Department of Fish and Game
Office of Spill Prevention and Response
Scientific Branch – Resource Assessment
20 Lower Ragsdale, Suite 100
Monterey, CA 93940

Subject: **Applicable or Relevant and Appropriate Requirements (ARARs) for NBVC Point Mugu Installation Restoration Program (IRP) Site 1, Mugu Lagoon Landfill, Revised Feasibility Study**

Introduction

The Department of Fish and Game – Office of Spill Prevention and Response (DFG-OSPR) received your October 17, 2002, request for our Applicable or Relevant and Appropriate Requirements (ARARs) for NAS Point Mugu Installation Restoration Program (IRP) Site 1, Lagoon Landfill. These ARARs will be incorporated in the Navy's pending revised Feasibility Study (FS) that will evaluate appropriate remedial alternatives.

Background

IRP Site 1, the lagoon landfill, is located at NAS Point Mugu, in Ventura County, about 50 miles northwest of Los Angeles. The eastern part of the IRP Site 1 is adjacent to Mugu Lagoon, near the mouth of the Calleguas Creek. The landfill is no longer in use and is currently unoccupied except for storage boxes and other equipment located on a paved area within the landfill boundary. From 1952 until the mid-1970's, the landfill was used for lowland filling, dredge materials storage, and solid waste landfilling and burning operations. Annual solid waste volumes burned or buried at the site are estimated at 10,000 tons. Most of the site is relatively flat. Parts of the surface of the site are mounded because of the presence of piles of soil and metal debris.

An initial assessment of IRP Site 1, conducted in 1985, determined the types of waste disposed at the site. A 1991 site inspection of IRP Site 1 determined the presence of hazardous materials. Soil borings and well monitoring were used to determine the types and extent of contamination. IRP Site 1 was recommended for further action to be addressed in the pending FS. The objective of this FS is to develop appropriate alternatives to address soil, surface water, and groundwater contamination at the site and to evaluate closure activities for the landfill.

Comments

A list of ARARs for IRP Site 1 prepared by DFG-OSPR staff and reviewed by legal counsel is enclosed. A detailed current biological characterization of IRP Site 1 should be conducted to identify habitats at the site and the biological resources such as special-status species that may be present. If such a biological characterization/survey has already been conducted DFG-OSPR assumes these survey results will be incorporated in the pending FS.

As the trustee for California's fish and wildlife resources, DFG-OSPR requests that these ARARs be included in the Revised Feasibility Study. It is important to fully document the biological resources occurring at IRP Site 1 so that consistency with DFG-OSPR's ARARs can be assessed. If sensitive habitats and/or special-status species will be affected by remedial activities, potential mitigation measures should be discussed with the appropriate natural trustee agencies. Please do not hesitate to contact me if you have any additional questions or would like to further discuss this matter. I may be reached at telephone number (831) 649-2876 or via e-mail: pvelez@ospr.dfg.ca.gov.

Enclosure

Reviewed by: Wendy Johnson
DFG-OSPR Legal Counsel

cc: Julie Yamamoto, Ph. D.
Department of Fish and Game
Office of Spill Prevention and Response
Sacramento, CA

Regina Donohoe, Ph. D.
Department of Fish and Game
Office of Spill Prevention and Response
Monterey, CA

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs FOR POINT MUGU, IRP SITE 1

LOCATION	STANDARD	SPECIFIC CITATION	ARAR/TBC EXPLANATION
California fish and wildlife resources	The Department of Fish and Game holds natural resources in public trust for the State of California	Fish and Game Code section 711.7	This Code section designates the Department of Fish and Game as the trustee agency over California's fish and wildlife resources. It also concerns the payment of state filing and permit fees by person engaging in projects or activities under federal licenses, contract or permit. *California Public Resources Code section 10005 and section 21089.* This section expresses administrative policy and does not necessarily impose a substantive requirement in this situation. This section should be considered to the extent that DFG is the trustee agency over California's fish and wildlife resources.

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs FOR POINT MUGU, IRP SITE 1

LOCATION	STANDARD	SPECIFIC CITATION	ARAR/TBC EXPLANATION
Aquatic habitat/species	Action must be taken if toxic materials are placed where they can enter waters of the State. There can be no release that would have a deleterious effect on species or habitat.	Fish and Game Code section 5650 (a), (b) & (f)	These code sections prohibit the deposition into state waters of, *inter alia*, petroleum products (Section 5650(a)), factory refuse (section 5650(b)), and any substance deleterious to fish, plants or birds (section 5650(f)). These are substantive, promulgated environmental protection requirements. These requirements impose strict criminal liability on violators. (*People v. Chevron Chemical Company (1983) 143 Cal. App. 3d 50).* This imposition of strict criminal liability imposes a standard that is more stringent than federal law. The extent to which each subdivision of section 5650 is relevant and appropriate depends on the site characterization. Section 5650 makes it unlawful "to deposit in, permit to pass into, or place where it can pass into the waters of this state" the enumerated substances.
Wildlife Species	Action must be taken to prohibit the taking of birds and mammals, including the taking by poison	Fish and Game Code section 3005	This code section prohibits the taking of birds and mammals, including taking by poison. "Take" is defined by Fish and Game Code section 86 to include killing. "Poison" is not defined in the code. Although there is no state authority on this point, federal law recognizes that poison, such as Strychnine, may effect incidental taking. (*Defenders of Wildlife v. Administrator, Environmental Protection Agency (1989) 882. F. 2d. 1295).* This code section imposes a substantive, promulgated environmental protection requirement.
Aquatic and wildlife species/habitat	Action may be taken to collect damages for the taking of birds, mammals, fish, reptiles or amphibians	Fish and Game Code section 2014	This section declares that it is the policy of the state to conserve its natural resources. It allows the state to recover damages in a civil action against any person or local agency which unlawfully or negligently takes or destroys any bird, mammal, fish, reptile or amphibian protected by the laws of the state.

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs FOR POINT MUGU, IRP SITE 1

LOCATION	STANDARD	SPECIFIC CITATION	ARAR/TBC EXPLANATION
Rare native plants	Action must be taken to conserve native plants, there can be no releases and/or actions that would have a deleterious effect on species or habitat.	Fish and Game Code section 1900 *et seq.*	These code sections make provisions concerning native plants protection, including: criteria for determining endangered plant species; designation of endangered plants by the Fish and Game Commission; research by the Department; takings by the Department for scientific or propagation purposes; other prohibitions on takings; exercise of enforcement authority; arrests and confiscation; carrying out of plant conservation programs by other state departments and agencies; and unauthorized public agency regulations pertaining to agriculture. Sections 1900, 1901, 1904, 1905, 1906, 1907, 1909, 1910, 1911, 1912, and 1913 are procedural or administrative in nature and do not impose any substantive requirements. Section 1908 imposes a substantive requirement by forbidding any "person" to take rare or endangered native plants. Fish and Game Code section 67 provides the definition of "person" as any natural person or any partnership, corporation, limited liability company, trust, or other type of association. Whether the federal government or contractors acting on behalf of the federal government would fall within that definition is a potential issue. To the extent that there are rare or endangered plants on Point Mugu, IRP - Site 1, section 1908 would be an ARAR.

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs FOR POINT MUGU, IRP SITE 1

LOCATION	STANDARD	SPECIFIC CITATION	ARAR/TBC EXPLANATION
Endangered Species/habitat	Criteria to be considered in Standard for Fish and Game Code section 2080	Fish and Game Code section 2050-2068; 2070-2079	These code sections comprise Article 1 and Article 2 of chapter 1.5 of California Endangered Species Act. These sections make declarations of policy and provide definitions, and do not impose any substantive requirements. We ask that these sections be considered to the extent that Fish and Game Code section 2080 is an ARAR (as noted below).
Endangered Species	Action must be taken to conserve endangered species, there can be no releases and/or actions that would have a deleterious effect on species or habitat.	Fish and Game Code section 2080	This section prohibits the take, possession, purchase or sell within the state, any species (including rare native plant species), or any product thereof, that the commission determines to be an endangered or threatened species, or the attempt of any of these acts. This section is applicable and relevant to the extent that there are endangered or threatened species in the area which have the potential of being affected if actions are not taken to conserve the species. This section prohibits releases and/or actions that would have a deleterious effect on species or their habitat. This section and applicable Title 14 regulations should be considered as ARARs. *California Code of Regulations Title 14 sections 670.2* provides a listing the plants of California declared to be Endangered, Threatened or Rare. *California Code of Regulations Title 14 section 670.5* provides a listing of Animals of California declared to be endangered or threatened. *California Code of Regulations Title 14 section 783 et. seq.*, provides the implementation regulations for the California Endangered Species Act.

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs FOR POINT MUGU, IRP SITE 1

LOCATION	STANDARD	SPECIFIC CITATION	ARAR/TBC EXPLANATION
Fully protected bird species/habitat	Action must be taken to prevent the taking of fully protected birds	Fish and Game Code section 3511	This section provides that it is unlawful to take or possess any of the following fully protected birds: (a). American peregrine falcon (b). Brown Pelican (c). California black rail (d). California Clapper rail (e). California Condor (f). California least tern (g). Golden eagle (h). Greater sandhill crane (i). Light footed clapper rail (j). Southern bald eagle (k). Trumpeter swan (l). White-tailed kite (m). Yuma clapper rail This statute should be considered applicable and relevant to the extent that any of the above mentioned fully protected birds or their habitat are detected on or near Point Mugu, IRP - Site 1.

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs FOR POINT MUGU, IRP SITE 1

LOCATION	STANDARD	SPECIFIC CITATION	ARAR/TBC EXPLANATION
Migratory Non-game Birds	Actions must be taken to prevent the take or possession of any migratory nongame birds	Fish and Game Code section 3513	This section prohibits the take or possession of any migratory nongame bird as designated in the Migratory Bird Treaty Act, *16 U.S.C. sections 3371-3378; 50 C.F.R. section 10.13*, or any part of such migratory nongame bird, except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the Migratory Treaty Act. This section is Applicable and Relevant, unless one of the rules and regulations adopted by the Secretary of the Interior exempt the activity and to the extent that this code section is more stringent than the Migratory Bird Act found at *16 U.S.C. section 3371.*
Wetlands	Actions must be taken to assure that there is "no net loss" of wetlands acreage or habitat value. Action must be taken to preserve, protect, restore and enhance California's wetland acreage and habitat values.	Fish and Game Commission Wetlands Policy (adopted 1987) included in Fish and Game Code Addenda	This policy seeks to provide for the protection, preservation, restoration, enhancement and expansion of wetland habitat in California. Further, it opposes any development or conversion of wetland that would result in a reduction of wetland acreage or habitat value. It adopts the USFWS definition of a wetland which utilizes hydric soils, saturation or inundation, and vegetable criteria, and requires the presence of at least one of these criteria (rather than all three) in order to classify an area as a wetland. This policy is not a regulatory program and should be included as a TBC.

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs FOR POINT MUGU, IRP SITE 1

LOCATION	STANDARD	SPECIFIC CITATION	ARAR/TBC EXPLANATION
Fully Protected Mammals	Actions must be taken to assure that no fully protected mammals are taken or possessed at any time.	Fish and Game Code section 4700	This section prohibits the take or possession of any of the fully protected mammals or their parts. The following are fully protected mammals: (a) Morro Bay kangaroo rat (b) Bighorn sheep except Nelson bighorn sheep (c) Northern elephant seal (d) Guadalupe fur seal (e) Ring-tailed cat (f) Pacific right whale (g) Salt-marsh harvest mouse (h) Southern sea otter (i) Wolverine This section is applicable, relevant, and appropriate to the extent that any of these mammals and/or their habitat are located on or near Point Mugu, IRP - Site 1.
Fully Protected Reptiles and Amphibians	Actions must be taken to prevent the take or possession of any fully protected reptile or amphibian.	Fish and Game Code section 5050	This section prohibits the take or possession of fully protected reptiles and amphibians or parts thereof. The following are fully protected reptiles and amphibians: (a) Blunt-nosed leopard lizard (b) San Francisco garter snake (c) Santa Cruz long-toed salamander (e) Black toad This section should be considered to the extent that such amphibians or reptiles and/or their habitat are located on or near Point Mugu, IRP - Site 1.

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs FOR POINT MUGU, IRP SITE 1

LOCATION	STANDARD	SPECIFIC CITATION	ARAR/TBC EXPLANATION
Birds of Prey	Action must be taken to prevent the take, possession, or destruction of any birds-of prey or their eggs	Fish and Game Code section 3503.5	This section prohibits the take, possession, or destruction of any birds in the orders of Falconiformes or Strigiformes (birds-of-prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto. This section will be applicable and relevant to the extent that such species or their eggs are located on or near Point Mugu, IRP - Site 1.
Nongame birds	Actions must be taken to prevent the take of nongame birds.	Fish and Game Code section 3800	This section prohibits the take of nongame birds, except in accordance with regulations of the commission, or when related to mining operations with a mitigation plan approved by the department. This section further provides requirements concerning mitigation plans related to mining. This section is applicable and relevant to the extent that nongame birds or their eggs are located on or near the site and such species have not been included in the fish and wildlife conservation plan filed pursuant to the Federal Fish and Wildlife Conservation Act. Species included in the plan will be protected at the federal standard making this section an ARAR to the extent that it is more stringent than the federal standard of protection.
Fur-bearing mammals	Provides manners under which fur-bearing mammals may be taken	Fish and Game Code section 4000, et. Seq.	This section provides that a fur-bearing mammal may be taken only with a trap, a firearm, bow and arrow, poison under a proper permit, or with the use of dogs.
Nongame mammals	Action must be taken to avoid the take or possession of nongame mammals	Fish and Game Code section 4150	Nongame mammals are those occurring naturally in California which are not game mammals, fully protected mammals, or fur-bearing mammals. These mammals, or their parts, may not be taken or possessed except as provided in this code or in accordance with regulations adopted by the commission.

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs FOR POINT MUGU, IRP SITE 1

LOCATION	STANDARD	SPECIFIC CITATION	ARAR/TBC EXPLANATION
Nongame Animals	Action must be taken to avoid the take of nongame mammals except as provided in applicable regulations	Title 14 California Code of Regulations (hereinafter referred as C.C.R.) section 472	This Regulation provides that nongame birds and mammals may not be taken. a). The following nongame birds and mammals may be taken except as provided in Chapter 6: English Sparrow, starling, coyote, weasels, skunks, opossum, moles and rodents (excludes tree and flying squirrels, and those listed as furbearers, endangered or threatened species); b). Fallow, sambar, sika, and axis deer may be taken concurrently with the general deer season. c). Aoudad, mouflon, tahr, and feral goats may be taken all year. d). American crows may be taken only under provisions of section 485 and by landowners or tenants, or person authorized by landowners or tenants, when American crows are committing or about to commit depredations upon ornamental shade trees, agricultural crops, livestock, or wildlife, or when concentrated in such numbers and manner as to constitute a health hazard or other nuisance. If required by Federal regulations, landowners or tenants shall obtain a Federal migratory bird depredation permit before taking any American crows or authorizing any other person to take them. Nongame birds and mammals including some of the species listed in subsections may be found at Point Mugu. Therefore this section is an ARAR to the extent that nongame birds and mammals are present at Point Mugu, IRP - Site 1.

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs FOR POINT MUGU, IRP SITE 1

LOCATION	STANDARD	SPECIFIC CITATION	ARAR/TBC EXPLANATION
Nongame Birds and NonGame Mammals	Methods of Take	Title 14 C.C.R. section 475	This regulation provides that birds and nongame mammals may be taken in any manner except as follows: a). Poison may not be used, b). Recorded or electrically amplified bird or mammal calls or sounds or recorded or electrically amplified imitations of bird or mammal calls or sounds may not be used to take any nongame bird or nongame mammal except coyotes, bobcats, American crows and starlings. The regulation further specifies when take with equipment and ammunition, traps, feed, bait and/or other material capable of attracting nongame mammals may occur. To the extent that any of the listed species occur on Point Mugu, IRP - Site 1, Title 14 C.C.R. section 475 is an ARAR.
Specially Protected Mountain Lion	Action must be taken to avoid injuring, taking, possessing or transporting any mountain lion.	Fish and Game Code sections 4800 et. seq.	Mountain lions are specially protected mammals in California. It is unlawful to take, injure, possess, transport, or sell any mountain lion or any part or product thereof. Violation of this section is a misdemeanor. Although mountain lions are not now present on Point Mugu, to the extent that one might be found in or near IRP – Site 1 at some future date, this section is an ARAR.
Conservation and Management of Marine Living Resources	Action must be taken for the protection and management of marine living resources	Fish and Game Code sections 7050 et. seq.	These sections provide that it is the policy of the state to ensure the conservation, sustainable use, and where feasible, restoration of California's marine living resources.
Tidal Invertebrates	Action must be taken to avoid the take or possession of mollusks, crustaceans, or other invertebrates	Fish and Game Code section 8500	It is unlawful to possess or take, unless otherwise expressly permitted in this chapter, mollusks, crustaceans, or other invertebrates, unless a valid tidal invertebrate permit has been issued. The taking, possessing, or landing of such invertebrates pursuant to this section shall be subject to regulations adopted by the commission.

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs FOR POINT MUGU, IRP SITE 1

LOCATION	STANDARD	SPECIFIC CITATION	ARAR/TBC EXPLANATION
Protected Amphibians	Action must be taken to avoid the take or possession of protected amphibians.	Title 14 C.C.R. sections 40 & 41	This regulation makes it unlawful to take, possess, purchase, propagate, sell, transport, import, or export any native reptile or amphibian, or parts thereof unless under special permit from the department issued pursuant to Title 14 C.C.R. sections 650 and 670.7 of these regulations, or section 2081 of the Fish and Game Code for those species in the regulations which are also state listed species. The following amphibians are protected amphibians: a. Santa Cruz long-toed salamander b. Siskiyou mountain salamander c. Desert slender salamander d. Kern Canyon slender salamander e. Tehachapi slender salamander f. Limestone salamander g. Shasta salamander h. Black toad i. Red Legged Frog j. Southwestern toad k. Mt. Lyell salamander l. Inyo Mountains salamander m. California tiger salamander n. Olympic salamander o. Del Norte salamander p. Colorado River toad q. Yosemite toad r. Foothill yellow-legged frog s. Mountain yellow-legged frog t. Cascade frog u. Spotted frog v. Lowland leopard frog w. Tailed frog x. Western spadefoot To the extent that any of these amphibians are found in or near Point Mugu, IRP - Site 1 this section is an ARAR.

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs FOR POINT MUGU, IRP SITE 1

LOCATION	STANDARD	SPECIFIC CITATION	ARAR/TBC EXPLANATION
Protected Reptiles	Action must be taken to avoid the take or possession of protected reptiles	14 C.C.R. sections 40 and 42	This regulation makes it unlawful to take, possess, purchase, propagate, sell, transport, import, or export any native reptile or amphibian, or parts thereof unless under special permit from the department issued pursuant to Title 14 C.C.R. sections 650 and 670.7 of these regulations, or section 2081 of the Fish and Game Code for those species in the regulations which are also state listed species. The following reptiles are protected: a. Blunt-nosed leopard lizard b. Banded Gila monster c. Southern rubber boa d. Alameda whipsnake e. San Francisco garter snake f. Giant garter snake g. Desert tortoise h. Panamint alligator lizard i. Sonora mud turtle j. Island night lizard k. Flat-tailed horned lizard l. San Diego mountain kingsnake m. Coachella Valley fringe-toed lizard n. Switak's barefoot gecko o. Lead-toed gecko p. Granite night lizard q. Orange throated whiptail r. Black legless lizard s. Coast horned lizard t. Western pond turtle u. San Joaquin coachwhip v. Two striped garter snake To the extent that any of these species is found in or near Point Mugu, IRP - Site 1 this section is an ARAR.
Furbearing Mammals	Action must be taken to avoid take	Title 14 C.C.R. section 460	Regulation makes it unlawful to take Fisher, marten, river otter, desert kit fox, and red fox. To the extent that any of these species are found in or near Point Mugu, IRP - Site 1 this section is an ARAR.

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs FOR POINT MUGU, IRP SITE 1

LOCATION	STANDARD	SPECIFIC CITATION	ARAR/TBC EXPLANATION
Furbearing Mammals	Provides methods of take for other furbearing mammals not listed in Title 14 C.C.R. section 460	Title 14 C.C.R. section 465	Furbearing mammals not listed specifically in Title 14 C.C.R. section 460 and listed in 14 C.C.R. section 461, 462, 463, and section 464 may be taken only with a firearm, bow and arrow, or with the use of dogs, or traps in accordance with the provisions of Section 465.5 of Title 14 and section 3003.1 of the Fish and Game Code. To the extent that any of these species are found in or near Point Mugu, IRP - Site 1 this section is an ARAR.
Fully Protected Fish	Actions must be taken to prevent the take or possession of any fully protected fish species.	Fish and Game Code section 5515	This section prohibits the take or possession of fully protected fish or parts thereof. The following are fully protected fish: (a) Colorado River squawfish (b) Thicktail chub (c) Mohave chub (d) Lost River sucker (e) Modoc sucker (f) Shortnose sucker (g) Humpback sucker (h) Owens River pupfish (i) Unarmored threespine stickleback (j) Rough sculpin This section is applicable, relevant and appropriate to the extent that such fish species or their habitat are located on or near Point Mugu, IRP - Site 1.

ENCLOSURE 3

STATE OF CALIFORNIA – THE RESOURCES AGENCY GRAY DAVIS, GOVERNOR

CALIFORNIA COASTAL COMMISSION
45 FREMONT STREET, SUITE 2000
SAN FRANCISCO, CA 94105-2219
VOICE AND TDD (415) 904-5200

February 7, 2000

Manny Alonzo
Edwon F. Lowry, Director
Department of Toxic Substances Control
5796 Corporate Ave.
Cypress, CA 90630

Attn: Manny Alonzo

Re: ARARs, Naval Air Weapons Station, Point Mugu

Dear Mr. Alonzo:

This is in response to your letter of February 3, 2000, in which you request ARARs applicable to remediation efforts at Sites 1,2,4,6,8,9 and 24 at the Naval Air Weapons Station (NAWS) in Point Mugu. To clarify applicable Coastal Commission authority, please note the provisions of Section 307 of the federal Coastal Zone Management Act (CZMA) (16 U.S.C. Section 1456, with implementing regulations at 15 CFR Part 930). The CZMA requires that activities on federal land, such as Navy cleanup operations at NAWS, that have the potential to affect the coastal zone may trigger the need for a consistency or negative determination, depending on the potential impact of any particular cleanup activity. We do not have specific (i.e., chemical, location and action specific) requirements; rather our requirements are more general in nature, both procedurally and substantively. Procedurally, we ask that you coordinate the cleanup activities with us to determine whether a consistency or negative determination is needed. Substantively, any requirements that cleanup projects would need to be consistent with are those found in Chapter 3 of the Coastal Act (see attachment for most likely applicable policies).

Please note that if a consistency determination needs to be submitted for this activity, it should include a finding as to whether the project is consistent to the maximum extent practicable with the California Coastal Management Program and the necessary information to support that conclusion, including an analysis of the project's consistency with Chapter 3 of the Coastal Act. (See CFR Section 930.39 for a full listing of the information required for a complete consistency determination.) If you have any questions about the need for or preparation of a consistency or negative determination, please contact James Raives, federal consistency coordinator for the Commission staff, at (415) 904-5289.

Sincerely,

Mark Delaplaine

MARK DELAPLAINE
Federal Consistency Supervisor

CC: Ventura Area Office
Jim Danza, U.S. Navy
James Raives

Attachment

Applicable Chapter 3 Policies
California Coastal Act

PUBLIC ACCESS

Section 30210.

In carrying out the requirement of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.

MARINE ENVIRONMENT

Section 30230.

Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.

Section 30231.

The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

Section 30232.

Protection against the spillage of crude oil, gas, petroleum products, or hazardous substances shall be provided in relation to any development or transportation of such materials. Effective containment and cleanup facilities and procedures shall be provided for accidental spills that do occur.

Section 30233.

(a) The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:

(l) New or expanded port, energy, and coastal-dependent industrial facilities, including commercial fishing facilities.

(2) Maintaining existing, or restoring previously dredged, depths in existing navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps.

(3) In wetland areas only, entrance channels for new or expanded boating facilities; and in a degraded wetland, identified by the Department of Fish and Game pursuant to subdivision (b) of Section 30411, for boating facilities if, in conjunction with such boating facilities, a substantial portion of the degraded wetland is restored and maintained as a biologically productive wetland. The size of the wetland area used for boating facilities, including berthing space, turning basins, necessary navigation channels, and any necessary support service facilities, shall not exceed 25 percent of the degraded wetland.

(4) In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities and the placement of structural pilings for public recreational piers that provide public access and recreational opportunities.

(5) Incidental public service purposes, including but not limited to, burying cables and pipes or inspection of piers and maintenance of existing intake and outfall lines.

(6) Mineral extraction, including sand for restoring beaches, except in environmentally sensitive areas.

(7) Restoration purposes.

(8) Nature study, aquaculture, or similar resource dependent activities.

(b) Dredging and spoils disposal shall be planned and carried out to avoid significant disruption to marine and wildlife habitats and water circulation. Dredge spoils suitable for beach replenishment should be transported for such purposes to appropriate beaches or into suitable long shore current systems.

(c) In addition to the other provisions of this section, diking, filling, or dredging in existing estuaries and wetlands shall maintain or enhance the functional capacity of the wetland or estuary. Any alteration of coastal wetlands identified by the Department of Fish and Game, including, but not limited to, the l9 coastal wetlands identified in its report entitled, "Acquisition Priorities for the Coastal Wetlands of California", shall be limited to very minor incidental public facilities, restorative measures, nature study, commercial fishing facilities in Bodega Bay, and development in already developed parts of south San Diego Bay, if otherwise in accordance with this division.

For the purposes of this section, "commercial fishing facilities in Bodega Bay" means that not less than 80 percent of all boating facilities proposed to be developed or improved, where such improvement would create additional berths in Bodega Bay, shall be designed and used for commercial fishing activities.

(d) Erosion control and flood control facilities constructed on water courses can impede the movement of sediment and nutrients which would otherwise be carried by storm runoff into coastal waters. To facilitate the continued delivery of these sediments to the littoral zone, whenever feasible, the material removed from these facilities may be placed at appropriate points on the shoreline in accordance with other applicable provisions of this division, where feasible mitigation measures have been provided to minimize adverse environmental effects. Aspects that shall be considered before issuing a coastal development permit for such purposes are the method of placement, time of year of placement, and sensitivity of the placement area.

LAND RESOURCES

Section 30240.

(a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas.

(b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.

Section 30251.

The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas. New development in highly scenic areas such as those designated in the California Coastline Preservation and Recreation Plan prepared by the Department of Parks and Recreation and by local government shall be subordinate to the character of its setting.

James Danza
Environmental Planner
Public Works Planning Branch
Naval Construction Battalion Center
Public Works Dept., Code PW320
1000 23rd Ave.
Port Hueneme, CA 93043-4301

ENCLOSURE 4

From: "Kerby Zozula" <kerby@vcapcd.org>
To: "Quang Than" <QThan@dtsc.ca.gov>
Date: 11/22/02 9:14AM
Subject: RE: ARARS

This isn't a whole lot of information to go by, so here is a very general answer.

In all cases, they must comply with Rule 50, "Opacity", for dust and Rule 51, "Nuisance", for odors. They must also review Rule 74.17 and Rule 74.17.1 to see if the landfill needs to have an emission capture and control system (for landfill gas emissions). If a capture and control system is required, they will need to get an Authority to Construct and Permit to Operate .(Rule 10) prior to installation and operation.

Kerby E. Zozula
VCAPCD
805/645-1421

-----Original Message-----
From: Quang Than [mailto:QThan@dtsc.ca.gov]
Sent: Friday, November 22, 2002 8:48 AM
To: kerby@vcapcd.org
Subject: Re: ARARS

Hi Kerby,

I need to gather the ARARs from all the agencies and sent to the Navy asap. I have just left a message on your voice mail. This is about the landfill at the lagoon at Point Mugu Naval Base. They are probably going to cover any exposed wastes, fill in the slow spot and grade the site to improve drainage. Please get back with me asap. Thank you, Kerby.

Quang Than
Hazardous Substances Engineer
California EPA/Department of Toxic Substances Control
Site Mitigation Branch/Office of Military Facilities
5796 Corporate Avenue, Cypress, CA 90630
714 484 5352 714 484 5437 (fax)

"The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our Web-site at www.dtsc.ca.gov."

>>> "Kerby Zozula" <kerby@vcapcd.org> 10/17/02 03:33PM >>>
Hello,

I have very serious problems with the Navy ARAR letter:

The APCD was not even on the CC: list and I know nothing about this project. I have not been contacted by the Navy and I am our "official" ARARS contact.

There is no such rule as Ventura County APCD Rule 403.

The project description is very poor. In general we may have permit requirements and we may have emission control requirements. This is especially true if we are talking about any sort of emissions to the air from the exposure of waste or fugitive or vent gasses.

Kerby E. Zozula
Supervisor, Engineering Division
Ventura County APCD
669 County Square Drive
Ventura, CA 93003
(805)645-1421
kerby@vcapcd.org

ENCLOSURE 5

From: "Humpert, Scott" <shumpert@CIWMB.ca.gov>
To: 'Quang Than' <QThan@dtsc.ca.gov>
Date: 10/24/02 9:52AM
Subject: RE: Your ARARs

Quang,

Attached is the set of ARAR's appropriate to the Point Mugu Site. The first set of attached ARARS is for Closure and Postclosure Maintenance. The second set is for Excavation and Consolidation. Closure and Postclosure Maintenance is appropriate. Excavation and Consolidation may occur and therefore be appropriate. Please let me know if you need this formalized in a letter.

Scott

-----Original Message-----
From: Quang Than [mailto:QThan@dtsc.ca.gov]
Sent: Wednesday, October 23, 2002 5:47 PM
To: Humpert, Scott; pvelez@ospr.dfg.ca.gov; praftery@rb4.swrcb.ca.gov; kerby@vcapcd.org
Subject: RE: Your ARARs

Is it possible for you to write me a letter identifying the ARARs from your shop? That would be much appreciated.

>>> "Humpert, Scott" <shumpert@CIWMB.ca.gov> 10/23/02 03:50PM >>>
Hi Quang,

My feeling is that the site has enough pockets of exposed waste to warrant grading and cover, gas, groundwater and leachate monitoring. Mike Gonzales proposed a chip-seal cover after grading and compacting. I would prefer the chip-seal closure, allowing a open storage facility as a postclosure landuse. Do you need a copy of the Waste Board's ARARs?

Scott
(916) 341-6359

-----Original Message-----
From: Quang Than [mailto:QThan@dtsc.ca.gov]
Sent: Thursday, October 17, 2002 2:56 PM
To: Humpert, Scott; pvelez@ospr.dfg.ca.gov; praftery@rb4.swrcb.ca.gov; kerby@vcapcd.org
Subject: Your ARARs

Hi everybody,

Attached is a letter from the Navy discussing their identification of the Applicable or Relevant and Appropriate Requirements (ARARs) associated with Installation Program Site 1, a.k.a. Lagoon Landfill. The Navy is preparing

a revised Feasibility Study (FS) to propose and evaluate remedial alternatives and would like to receive input from state agencies about the ARARs. It appears at this time that the favored alternative consists of covering exposed waste, grading to prevent ponding, and gas and leachate monitoring.

Please review the letter and provide me with your comments by October 31. Thank you very much.

Quang Than
Hazardous Substances Engineer
California EPA/Department of Toxic Substances Control
Site Mitigation Branch/Office of Military Facilities
5796 Corporate Avenue, Cypress, CA 90630
714 484 5352 714 484 5437 (fax)

"The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our Web-site at www.dtsc.ca.gov."

State ARARs for Solid Waste Disposal Site Closure and Postclosure Maintenance

Source	Standard, Requirement, Criterion, or Limitation	ARAR Status	Description	Comment	Associated Site
California Integrated Waste Management Act of 1989 PRC 40502 & 43020	27 CCR 21130 Ch. 3, Subch. 5, Art. 2, Closure & Postclosure Maint. Standards for Disposal Sites and Landfills	Applicable or Relevant and Appropriate	Emergency Response: potential emergency conditions that may exceed the design of the site and could endanger the public health or environment must be anticipated. Response procedures for these conditions must be addressed in the RD/RA plans.	Closure or Postclosure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2. Scope & Applicability pursuant 27 CCR 21100.	For closing sites
California Integrated Waste Management Act of 1989 PRC 40502 & 43020	27 CCR 21135 Ch. 3, Subch. 5, Art. 2, Closure & Postclosure Maint. Standards for Disposal Sites and Landfills	Applicable or Relevant and Appropriate	Site Security: all points of access to the site must be restricted, except permitted entry points. All monitoring, control, and recovery systems shall be protected from unauthorized access.	Closure or Postclosure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2. Scope & Applicability pursuant 27 CCR 21100	For closing sites
California Integrated Waste Management Act of 1989 PRC 40502 & 43020	27 CCR 21137 Ch. 3, Subch. 5, Art. 2, Closure & Postclosure Maint. Standards for Disposal Sites and Landfills	Applicable or Relevant and Appropriate	Structure Removal: site structures and leachate and gas control systems not intended for reuse will be dismantled and removed at the time of closure to protect public health and safety.	Closure or Postclosure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2. Scope & Applicability pursuant 27 CCR 21100	For closing sites
California Integrated Waste Management Act of 1989 PRC 40502 & 43020	27 CCR 21140 Ch. 3, Subch. 5, Art. 2, Closure & Postclosure Maint. Standards for Disposal Sites and Landfills	Applicable or Relevant and Appropriate	Final Cover: the final cover shall function with minimum maintenance and provide waste containment to protect public health and safety by controlling at a minimum, vectors, fire, odor, litter and landfill gas migration. The final cover shall also be compatible with postclosure land use.	Closure or Postclosure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2. Scope & Applicability pursuant 27 CCR 21100	For closing sites
California Integrated Waste Management Act of 1989 PRC 40502 & 43020	27 CCR 21142 Ch. 3, Sub. 5, Article 2, Closure & Postclosure Maint. Standards for Disposal Sites and Landfills	Applicable or Relevant and Appropriate	Final Grading: final grades must be designed and maintained to reduce impacts to health and safety and take into consideration any postclosure land use.	Closure or Postclosure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2. Scope & Applicability pursuant 27 CCR 21100	For closing sites
California Integrated Waste Management Act of 1989 PRC 40502 & 43020	27 CCR 21145 Ch. 3, Subch. 5, Art. 2, Closure & Postclosure Maint. Standards for Disposal Sites and Landfills	Applicable or Relevant and Appropriate	Slope Stability: the operator shall ensure the integrity of final slopes under both static and dynamic conditions to protect public health & safety and prevent damage to postclosure land uses, roads, structures, utilities, gas monitoring and control systems, leachate collection and control systems to prevent public contact with leachate, and prevent exposure of waste.	Closure or Postclosure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2. Scope & Applicability pursuant 27 CCR 21100.	For closing sites
California Integrated Waste Management Act of 1989 PRC 40502 & 43020	27 CCR 21150 Ch. 3, Subch. 5, Art. 2, Closure & Postclosure Maint. Standards for Disposal Sites and Landfills	Applicable or Relevant and Appropriate	Drainage and Erosion Control: the drainage and erosion control system shall be designed and maintained to ensure integrity of postclosure land uses, roads, and structures; to prevent public contact with waste and leachate; to ensure integrity of gas monitoring and control systems; to prevent safety hazards; and to prevent exposure of waste.	Closure or Postclosure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Sub. 5, Art. 2. Scope & Applicability pursuant to 27 CCR 21100	For closing sites
California Integrated Waste Management Act of 1989 PRC 40502 & 43020	27 CCR 21160 Ch. 3, Sub. 5, Article 2, Closure & Postclosure Maint. Standards for Disposal Sites and Landfills	Applicable or Relevant and Appropriate	Landfill Gas Control and Leachate Contact: landfill gas control shall be implemented and maintained; leachate must be collected and controlled in a manner which prevents public contact and controls vectors, nuisance and odor.	Closure or Postclosure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2, Scope & Applicability pursuant 27 CCR 21100. The state does not intend that subsurface leachate monitoring and collecting systems need to be added to existing landfills unless leachate production and/or accumulation is evident.	For closing sites

State ARARs for Solid Waste Disposal Site Closure and Postclosure Maintenance

Source	Standard, Requirement, Criterion, or Limitation	ARAR Status	Description	Comment	Associated Site
California Integrated Waste Management Act of 1989 PRC 40502 & 43020	27 CCR 20921-20937 Ch. 3, Sub. 4, Article 6, Closure & Postclosure Maint. Standards for Disposal Sites and Landfills	Applicable or Relevant and Appropriate	Gas Monitoring and Control During Closure and Postclosure: to protect public health and safety and the environment, landfill gases generated at a disposal site will be controlled to ensure that: 1) concentrations of methane gas do not exceed 1.25% by volume in air within on-site structures, 2) concentrations of methane do not exceed 5% by volume in air at the property or designated landfill boundary and 3) trace gases do not pose an acute or chronic exposure to toxic or carcinogenic compounds	Closure or Postclosure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subh. 5, Art. 2, Scope & Applicability pursuant 27 CCR 21100	For closing sites
California Integrated Waste Management Act of 1989 PRC 40502 & 43020	27 CCR 21180 Ch. 3, Sub. 5, Article 2, Closure & Postclosure Maint. Standards for Disposal Sites and Landfills	Applicable or Relevant and Appropriate	Postclosure Maintenance: the landfill must be maintained and monitored for no less than 30 years following closure.	Closure or Postclosure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2, Scope & Applicability pursuant 27 CCR 21100.	For closing sites
California Integrated Waste Management Act of 1989 PRC 40502 & 43020	27 CCR 21190 Ch. 3, Sub. 5, Article 2, Closure & Postclosure Maint. Standards for Disposal Sites and Landfills	Applicable or Relevant and Appropriate	Postclosure Land Use: Site Closure Design shall show one or more proposed uses of the closed site or show development that is compatible with open space. Changes in postclosure land use must be approved by the appropriate State agency prior to implementation.	Closure or Postclosure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2, Scope & Applicability pursuant 27 CCR 21100	For closing sites
California Integrated Waste Management Act of 1989 PRC 40502 & 43509	27 CCR 21800 Ch. 4, Subch. 4, Final Closure Plan Contents	Relevant and Appropriate	Provides the content requirements for closure plans for solid waste disposal sites.	Applies to solid waste disposal sites that received waste after November 1990. Relevant and appropriate for closing sites that did not receive waste after November 1990	For closing sites
California Integrated Waste Management Act of 1989 PRC 40502 & 43509	27 CCR 21830 Ch. 4, Subch. 4, Final Closure Plan Contents	Relevant and Appropriate	Provides the content requirements for postclosure maintenance plans for solid waste disposal sites.	Applies to solid waste disposal sites that received waste after November 1990. Relevant and appropriate for closing sites that did not receive waste after November 1990.	For closing sites
California Integrated Waste Management Act of 1989 PRC 40502 & 43509	27 CCR 21880 Ch. 4, Subch. 4, Final Closure Plan Contents	Relevant and Appropriate	Provides the content requirements to obtain certification that the solid waste disposal sites has closed pursuant to state standards.	Applies to solid waste disposal sites that received waste after November 1990. Relevant and appropriate for closing sites that did not receive waste after November 1990	For closing sites

27 CCR - California Code of Regulations, Title 27 ARAR - applicable or relevant and appropriate requirement ROD - Record of Decision RD/RA - remedial design/remedial action

State ARARs for Solid Waste Disposal Site Excavation and Consolidation

Source	Standard, Requirement, Criterion, or Limitation	ARAR Status	Description	Comment	Associated Site
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20510(a) Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1, Sec. 20510(a), Disposal Site Operating Records	Applicable	Weight/Volume Records: the weight or volume of waste accepted must be determined to an accuracy of ±10%	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20510(b) Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1, Sec. 20510(b), Disposal Site Operating Records	Applicable	Excavation Records: records shall be maintained for excavations which may affect the safe and proper operation of the site or cause damage to adjoining properties.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20530 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1, Sec. 20530, Site Security	Applicable	Site Security: the site shall be designed to discourage unauthorized access by persons or vehicles by using a perimeter barrier or topographic constraints. Areas within the site where open storage or ponding of hazardous materials occurs shall be separately fenced.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20540 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1, Sec. 20540, Roads	Applicable	Roads: landfill roads must minimize dust and tracking of materials onto public roads. Such roads shall be kept in safe condition and maintained such that vehicle access and unloading can be conducted during inclement weather.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites.
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20630 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1, Sec. 20630, Confined Unloading	Applicable	Confined Unloading: unloading of solid wastes shall be confined to as small an area as possible without resulting in traffic, personnel or public safety hazards. Requires normal deposition of waste at toe of fill.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20640 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1, Sec. 20640, Spreading and Compacting	Applicable	Spreading and Compacting: Requires spreading and compacting of refuse in layers.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20650 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 4, Sec. 20650, Grading of Fill Surface	Applicable	Grading of Fill Surface: Covered surfaces of the disposal area shall be graded to promote run-off and prevent ponding, accounting for future settlement.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20660 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1, Sec. 20660, Stockpiling	Applicable	Stockpiling: Requires stockpiled cover material and unsuitable native materials to be placed so as not to cause problems or interference with site operations.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated	27 CCR 20700	Applicable	Intermediate Cover: Requires compacted earthen material of at least	Applies to solid waste disposal sites as	For consolidation and

State ARARs for Solid Waste Disposal Site Excavation and Consolidation

Source	Standard, Requirement, Criterion, or Limitation	ARAR Status	Description	Comment	Associated Site
Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1, Sec. 20700, Intermediate Cover		12 inches on all surfaces of the fill where no additional solid waste will be deposited within 180 days.	defined by Public Resources Code Section 40122.	excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20710(a) Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1, Sec. 20710(a), Scavenging, Salvaging and Storage	Applicable	Scavenging: Scavenging is prohibited.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20710(b) Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1, Sec. 20710(b), Scavenging, Salvaging and Storage	Applicable	Salvaging Permitted: Salvaging is permitted in a planned and controlled manner.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20710(c) Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1, Sec. 20710(c), Scavenging, Salvaging and Storage	Applicable	Storage of Salvage: Salvage material must be safely isolated for storage.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20710(c) Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1, Sec. 20710(c), Scavenging, Salvaging and Storage	Applicable	Removal: Storage time for salvage materials shall be limited to a duration specified by the enforcement agency.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20720 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1, Sec. 20720, Non-Salvageable Items	Applicable	Non-Salvageable Items: Items capable of impairing public health shall not be salvaged without approval by the agencies.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20730 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1, Sec. 20730, Volume Reduction & Energy Recovery	Applicable	Volume Reduction and Energy Recovery: Volume reduction and energy recovery are permitted in planned and controlled manners. Processing area shall be confined to specified, clearly identifiable areas of the site.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20760 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1, Sec. 20710(c), Nuisance Control	Applicable	Nuisance Control: Each site shall be operated and maintained so as not to create a public nuisance.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989	27 CCR 20780(b) Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 4, Sec.	Applicable	Burning Wastes: Burning wastes shall be extinguished.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites

State ARARs for Solid Waste Disposal Site Excavation and Consolidation

Source	Standard, Requirement, Criterion, or Limitation	ARAR Status	Description	Comment	Associated Site
PRC 40502, 43020, 43021 and 43030	20780(b), Open Burning & Burning Wastes				
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20790 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 1, Sec. 20790, Nuisance Control	Applicable	Leachate Control: The operator shall ensure that leachate is controlled to prevent contact with the public.	The state does not intend that subsurface leachate monitoring and collection systems need to be installed at existing sites unless there is evidence of leachate production and/or accumulation. Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20800 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 4, Sec. 20800, Dust Control	Applicable	Dust Control: The operator shall take adequate measures to minimize the creation of dust and prevent safety hazards due to obscured visibility.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20810 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 4, Sec. 20810, Dust Control	Applicable	Vector and Bird Control: The operator shall take adequate measures to control or prevent the propagation, harborage, or attraction of flies, rodents, or other vectors, and to minimize bird problems.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20820 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 4, Sec. 20820, Drainage and Erosion Control	Applicable	Drainage And Erosion Control: The drainage system shall be designed and maintained to: ensure integrity of roads, structures, and gas monitoring and control systems; prevent safety hazards; and prevent exposure of waste.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20830 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 4, Sec. 20830, Grading of Fill Surface	Applicable	Litter Control: Litter and loose materials shall be routinely collected and disposed of properly.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 20919 Div. 2, Subdiv. 1, Ch. 3, Subch. 4, Art. 6, Sec. 20919, Gas Control	Applicable	Gas Control: The operator shall cause the site to be monitored for the presence and movement of landfill gas and take any necessary action to control such gases in the event that the gas causes a hazard or nuisance.	Applies to solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation and excavation sites
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	27 CCR 21600 Div. 2, Subdiv. 1, Ch. 4, Subch. 3, Art. 2, Sec. 21600, Report of Disposal Site Info	Relevant and Appropriate	Report of Disposal Site Information: The planning and procedural requirements necessary to ensure that solid waste is handled and disposed in manners that protect public health and safety and the environment must be conducted.	Applies to operating solid waste disposal sites as defined by Public Resources Code Section 40122.	For consolidation sites

14 CCR - California Code of Regulations, Title 14 ARAR - applicable or relevant and appropriate requirement ROD - Record of Decision RD/RA - remedial design/remedial action

ENCLOSURE 6

Department of Toxic Substances Control
Applicable or Relevant and Appropriate Requirements (ARARs)

ISSUE/ACTION	REQUIREMENT	CITATION	COMMENTS
Determination if a waste is hazardous	Waste containing contaminants exceeding regulatory level be considered hazardous	22 CCR 66261.24	Criteria for identifying a waste as hazardous. Applicable if waste suspected of being hazardous is generated as a result of this remedial action
Storage of hazardous waste on-site	Limit accumulation time to 90 days unless exempted	22 CCR 66262.34	Applicable if hazardous waste is generated as a result of this remedial action
Off-site disposal of hazardous waste	Applicability, manifest, pre-transport requirements, recordkeeping and reporting, and export of hazardous waste	Title 22, Chapter 12, Articles 1-5, Sections 66262.10-66262.57	Applicable if hazardous waste generated as a result of this remedial action is disposed off-site
Off-site transportation of hazardous waste	General requirements, compliance with manifest systems and recordkeeping, discharges and exemption	Title 22, Chapter 13, Articles 1-4, Sections 66263.10-66263.46	Standards applicable to transporters of hazardous waste
Landfill residual repositories	Applicability, design and operating requirements, monitoring and inspection, surveying and recordkeeping, closure and post-closure, special requirements	Title 22, Division 4.5, Chapter 14, Articles 14 & 14.5, Sections 66264.300-66264.321	Applicable to disposal of hazardous waste

Department of Toxic Substances Control
Applicable or Relevant and Appropriate Requirements (ARARs)

ISSUE/ACTION	REQUIREMENT	CITATION	COMMENTS
Land disposal restrictions, RCRA wastes	General applicability, dilution prohibition, waste analysis and recordkeeping	Title 22, Division 4.5, Chapter 18, Article 1	Defines hazardous wastes that are restricted from land disposal and prohibited waste that may be land disposed
Land disposal prohibitions, non-RCRA waste	Waste specific prohibitions	Title 22, Division 4.5 Chapter 18, Section 66268.100	Identifies non-RCRA wastes that are subject to land disposal prohibitions
Water quality monitoring and response	Applicability, groundwater protection standard, point and period of compliance, general, detection and compliance groundwater monitoring programs, corrective action program	Title 22, Division 4.5, Chapter 14, Article 6, Section 66264.90-100	Groundwater monitoring and response
Occupational Health and Safety Act	Specific requirements that employers must meet to ensure the safety of their employees	California Health and Safety Code (HSC), Division 5, Section 6300 et seq.	To Be Considered (TBC) to assures safe and healthy working conditions
California Health and Safety Code	Restrictions of present and future land uses	HSC 25202.5	Allows DTSC to enter an agreement with the owner of a hazardous facility to restrict land uses
California Civil Code	Restrictions of land use on successive land owners	Civil Code Section 1471	Provide conditions under which land-use restrictions will apply to successive owners of land

ATTACHMENT E-7

ARARS DETERMINATION LETTER
IWMB TO NAVY (JULY 11, 2003)

California Integrated Waste Management Board

Linda Moulton-Patterson, Chair
1001 I Street ● Sacramento, California 95814 ● (916) 341-6000
Mailing Address: P. O. Box 4025, Sacramento, CA 95812-4025
www.ciwmb.ca.gov

Gray Davis
Governor

Winston H. Hickox
Secretary for Environmental Protection

July 11, 2003

Mr. Michael J. Gonzales
Remedial Project Manager
Department of the Navy
Southwest Division
Naval Facilities Engineering Command
1220 Pacific Highway
San Diego, CA 92132-5190

REVISED FEASIBILITY STUDY, IRP SITE 1 (RUNWAY LANDFILL/POINT MUGU), FACILITY NO. 56-CR-0050

Dear Mr. Gonzales:

The California Integrated Waste Management Board (Board) staff has reviewed the Revised Feasibility Study (RFS), IRP Site 1 (Runway Landfill/Point Mugu), Facility No. 56-CR-0050, and has the following comments.

During a site visit last year exposed waste, irregular or a lack of grading, and poor drainage leading to what seemed as erosion of older cover material were observed over a significant portion of the landfill. While discussing this issue with you, you mentioned the possibility of extending an existing chip seal surface to include these deficient areas. At this time, would an extension of the chip seal surface be considered as a possible alternative? Please discuss

If an extension of the chip seal surface is not an alternative, the chosen alternative should at a minimum provide adequate cover, grading, drainage, and erosion protection for all waste disposal areas.

It appears part of the Board's Applicable or Relevant and Appropriate Requirements (ARARs) were inadvertently omitted from the RFS. Please include the attached additional ARARs in the RFS. The ARARs currently presented in the RFS address requirements for the excavation and consolidation of a landfill. The additional ARARs address requirements for the closure and postclosure maintenance of a landfill.

If you have any questions concerning this letter please contact me at (916) 341-6359, or email at shumpert@ciwmb.ca.gov.

Sincerely,

Scott Humpert, P.E.
Waste Management Engineer
Permitting and Enforcement Division

Attachment:

cc: Mr. Peter Chen, Department of Toxic Substances Control, 5796 Corporate Avenue, Cypress, California 90630
Ms. Marie McCrink, Department of Toxic Substances Control, 19151 Croyden Way, Suite 3, Sacramento, California 95827-2106
Mr. John Christopher, Department of Toxic Substances Control, 8810 Cal Center Drive, 2nd Floor, Sacramento, California 95812-0806
Mr. Peter Raftery, Los Angeles Regional Water Quality Control Board
Ms. Patty Velez, Department of Fish & Game, 20 Lower Ragsdale Road, Suite 100, Monterey, California 93940

State ARARs for Solid Waste Disposal Site Closure and Postclosure Maintenance

Source	Standard, Requirement, Criterion, or Limitation	ARAR Status	Description	Comment	Associated Site
California Integrated Waste Management Act of 1989 PRC 40502 & 43020	27 CCR 21130 Ch. 3, Subch. 5, Art. 2, Closure & Postclosure Maint. Standards for Disposal Sites and Landfills	Applicable or Relevant and Appropriate	Emergency Response: potential emergency conditions that may exceed the design of the site and could endanger the public health or environment must be anticipated. Response procedures for these conditions must be addressed in the RD/RA plans.	Closure or Postclosure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2. Scope & Applicability pursuant 27 CCR 21100.	For closing sites
California Integrated Waste Management Act of 1989 PRC 40502 & 43020	27 CCR 21135 Ch. 3, Subch. 5, Art. 2, Closure & Postclosure Maint. Standards for Disposal Sites and Landfills	Applicable or Relevant and Appropriate	Site Security: all points of access to the site must be restricted, except permitted entry points. All monitoring, control, and recovery systems shall be protected from unauthorized access.	Closure or Postclosure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2. Scope & Applicability pursuant 27 CCR 21100	For closing sites
California Integrated Waste Management Act of 1989 PRC 40502 & 43020	27 CCR 21137 Ch. 3, Subch. 5, Art. 2, Closure & Postclosure Maint. Standards for Disposal Sites and Landfills	Applicable or Relevant and Appropriate	Structure Removal: site structures and leachate and gas control systems not intended for reuse will be dismantled and removed at the time of closure to protect public health and safety.	Closure or Postclosure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2. Scope & Applicability pursuant 27 CCR 21100	For closing sites
California Integrated Waste Management Act of 1989 PRC 40502 & 43020	27 CCR 21140 Ch. 3, Subch. 5, Art. 2, Closure & Postclosure Maint. Standards for Disposal Sites and Landfills	Applicable or Relevant and Appropriate	Final Cover: the final cover shall function with minimum maintenance and provide waste containment to protect public health and safety by controlling at a minimum, vectors, fire, odor, litter and landfill gas migration. The final cover shall also be compatible with postclosure land use.	Closure or Postclosure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2. Scope & Applicability pursuant 27 CCR 21100	For closing sites
California Integrated Waste Management Act of 1989 PRC 40502 & 43020	27 CCR 21142 Ch. 3, Sub. 5, Article 2, Closure & Postclosure Maint. Standards for Disposal Sites and Landfills	Applicable or Relevant and Appropriate	Final Grading: final grades must be designed and maintained to reduce impacts to health and safety and take into consideration any postclosure land use.	Closure or Postclosure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2. Scope & Applicability pursuant 27 CCR 21100	For closing sites
California Integrated Waste Management Act of 1989 PRC 40502 & 43020	27 CCR 21145 Ch. 3, Subch. 5, Art. 2, Closure & Postclosure Maint. Standards for Disposal Sites and Landfills	Applicable or Relevant and Appropriate	Slope Stability: the operator shall ensure the integrity of final slopes under both static and dynamic conditions to protect public health & safety and prevent damage to postclosure land uses, roads, structures, utilities, gas monitoring and control systems, leachate collection and control systems to prevent public contact with leachate, and prevent exposure of waste.	Closure or Postclosure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2. Scope & Applicability pursuant 27 CCR 21100.	For closing sites
California Integrated Waste Management Act of 1989 PRC 40502 & 43020	27 CCR 21150 Ch. 3, Subch. 5, Art. 2, Closure & Postclosure Maint. Standards for Disposal Sites and Landfills	Applicable or Relevant and Appropriate	Drainage and Erosion Control: the drainage and erosion control system shall be designed and maintained to ensure integrity of postclosure land uses, roads, and structures; to prevent public contact with waste and leachate; to ensure integrity of gas monitoring and control systems; to prevent safety hazards; and to prevent exposure of waste.	Closure or Postclosure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Sub. 5, Art. 2. Scope & Applicability pursuant to 27 CCR 21100	For closing sites
California Integrated Waste Management Act of 1989 PRC 40502 & 43020	27 CCR 21160 Ch. 3, Sub. 5, Article 2, Closure & Postclosure Maint. Standards for Disposal Sites and Landfills	Applicable or Relevant and Appropriate	Landfill Gas Control and Leachate Contact: landfill gas control shall be implemented and maintained; leachate must be collected and controlled in a manner which prevents public contact and controls vectors, nuisance and odor.	Closure or Postclosure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2, Scope & Applicability pursuant 27 CCR 21100. The state does not intend that subsurface leachate monitoring and collecting systems need to be added to existing landfills unless leachate production and/or accumulation is evident.	For closing sites

State ARARs for Solid Waste Disposal Site Closure and Postclosure Maintenance

Source	Standard, Requirement, Criterion, or Limitation	ARAR Status	Description	Comment	Associated Site
California Integrated Waste Management Act of 1989 PRC 40502 & 43020	27 CCR 20921-20937 Ch. 3, Sub. 4, Article 6, Closure & Postclosure Maint. Standards for Disposal Sites and Landfills	Applicable or Relevant and Appropriate	Gas Monitoring and Control During Closure and Postclosure: to protect public health and safety and the environment, landfill gases generated at a disposal site will be controlled to ensure that: 1) concentrations of methane gas do not exceed 1.25% by volume in air within on-site structures, 2) concentrations of methane do not exceed 5% by volume in air at the property or designated landfill boundary and 3) trace gases do not pose an acute or chronic exposure to toxic or carcinogenic compounds	Closure or Postclosure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subh. 5, Art. 2, Scope & Applicability pursuant 27 CCR 21100	For closing sites
California Integrated Waste Management Act of 1989 PRC 40502 & 43020	27 CCR 21180 Ch. 3, Sub. 5, Article 2, Closure & Postclosure Maint. Standards for Disposal Sites and Landfills	Applicable or Relevant and Appropriate	Postclosure Maintenance: the landfill must be maintained and monitored for no less than 30 years following closure.	Closure or Postclosure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2, Scope & Applicability pursuant 27 CCR 21100.	For closing sites
California Integrated Waste Management Act of 1989 PRC 40502 & 43020	27 CCR 21190 Ch. 3, Sub. 5, Article 2, Closure & Postclosure Maint. Standards for Disposal Sites and Landfills	Applicable or Relevant and Appropriate	Postclosure Land Use: Site Closure Design shall show one or more proposed uses of the closed site or show development that is compatible with open space. Changes in postclosure land use must be approved by the appropriate State agency prior to implementation.	Closure or Postclosure Maintenance Standards for Disposal Sites and Landfills of 27 CCR, Ch. 3, Subch. 5, Art. 2, Scope & Applicability pursuant 27 CCR 21100	For closing sites
California Integrated Waste Management Act of 1989 PRC 40502 & 43509	27 CCR 21800 Ch. 4, Subch. 4, Final Closure Plan Contents	Relevant and Appropriate	Provides the content requirements for closure plans for solid waste disposal sites.	Applies to solid waste disposal sites that received waste after November 1990. Relevant and appropriate for closing sites that did not receive waste after November 1990	For closing sites
California Integrated Waste Management Act of 1989 PRC 40502 & 43509	27 CCR 21830 Ch. 4, Subch. 4, Final Closure Plan Contents	Relevant and Appropriate	Provides the content requirements for postclosure maintenance plans for solid waste disposal sites.	Applies to solid waste disposal sites that received waste after November 1990. Relevant and appropriate for closing sites that did not receive waste after November 1990.	For closing sites
California Integrated Waste Management Act of 1989 PRC 40502 & 43509	27 CCR 21880 Ch. 4, Subch. 4, Final Closure Plan Contents	Relevant and Appropriate	Provides the content requirements to obtain certification that the solid waste disposal sites has closed pursuant to state standards.	Applies to solid waste disposal sites that received waste after November 1990. Relevant and appropriate for closing sites that did not receive waste after November 1990	For closing sites

27 CCR - California Code of Regulations, Title 27 ARAR - applicable or relevant and appropriate requirement ROD - Record of Decision RD/RA - remedial design/remedial action

APPENDIX F
ALTERNATIVE COST COMPONENTS

APPENDIX F
ALTERNATIVE COST COMPONENTS

Alternative 1 – No Further Action.

Alternative 2 – Institutional Controls

Institutional Controls Include:
- Regional Shore Infrastructure Plan
- Memorandum of Agreement (including negotiations with the state)

5-Year Review Includes:
- Site inspection and interview
- Report preparation

Alternative 3 – Institutional Controls; and Landfill Cover Repair, Maintenance, and Drainage Improvements

Institutional Controls Includes:
- See above

Landfill Cover Repair Includes:
- Excavation of borrow fill
- Delivery of borrow fill
- Rough grading of dumped borrow fill

Landfill Maintenance Includes:
- Semiannual, quarterly, and monthly inspections and miscellaneous maintenance

Landfill Drainage Improvements Includes:
- Assume improvements occur during rough grading of dumped borrow fill

5-Year Review Includes:
- See above

Present Value Analysis – Actual costs include a 20 percent contingency factor and are rounded to the nearest $1,000.

Capital Costs (Year 0)
- Institutional Controls ($47,000) and Landfill Cover Repair and Drainage Improvements ($403,000)

Annual O&M Costs
- Landfill Maintenance ($10,000 [beginning in year 1])

Periodic Costs ($50,000 [Year 5])

- 5-Year Review

Total Actual Cost

- Sum of the total cost per year

Present Value Cost (Assuming a 1.9 percent discount factor and 0 percent inflation factor)

- Present value of the total cost per year

Note: Remedial alternatives described in Chapter 3 do not contain the CERCLA 5-year Review as an option because it offers no comparative value; the 5-year review will occur in all cases. Costs for the 5-year review are included in this appendix for planning purposes.

Alternative Number 1				
Year	Capital Costs ($)	Annual O&M Costs ($)	Periodic Costs ($)	Total Cost ($)
0	$0.00	$0.00	$0.00	$0.00
1	$0.00	$0.00	$0.00	$0.00
2	$0.00	$0.00	$0.00	$0.00
3	$0.00	$0.00	$0.00	$0.00
4	$0.00	$0.00	$0.00	$0.00
5	$0.00	$0.00	$0.00	$0.00
Total	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Alternative Number 2				
Year	Capital Costs ($)	Annual O&M Costs ($)	Periodic Costs ($)	Total Cost ($)
0	$46,500.00	$0.00	$0.00	$46,500.00
1	$0.00	$0.00	$0.00	$0.00
2	$0.00	$0.00	$0.00	$0.00
3	$0.00	$0.00	$0.00	$0.00
4	$0.00	$0.00	$0.00	$0.00
5	$0.00	$0.00	$49,108.92	$49,108.92
Total	**$46,500.00**	**$0.00**	**$49,108.92**	**$95,608.92**

Alternative Number 3				
Year	Capital Costs ($)	Annual O&M Costs ($)	Periodic Costs ($)	Total Cost ($)
0	$448,811.57	$0.00	$0.00	$448,811.57
1	$0.00	$9,615.47	$0.00	$9,615.47
2	$0.00	$9,615.47	$0.00	$9,615.47
3	$0.00	$9,615.47	$0.00	$9,615.47
4	$0.00	$9,615.47	$0.00	$9,615.47
5	$0.00	$9,615.47	$49,108.92	$58,724.39
Total	**$448,811.57**	**$48,077.33**	**$49,108.92**	**$545,997.82**

Present Value Analysis

Actual costs presented below include a 20% contingency factor and are rounded to the nearest $1,000.

Alternative Number 1 - No Further Action (Present Value at 1.9% = $0)

Alternative Number 2 - Institutional Controls and 5-Year Review

Alternative Number 2					
Year	**Capital Costs ($)**	**Annual O&M Costs ($)**	**Periodic Costs ($)**	**Total Annual Cost ($)**	**Present Value at 1.9% ($)**
0	$47,000	$0	$0	$47,000	$47,000
1	$0	$0	$0	$0	$0
2	$0	$0	$0	$0	$0
3	$0	$0	$0	$0	$0
4	$0	$0	$0	$0	$0
5	$0	$0	$50,000	$50,000	$46,000
Total	**$47,000**	**$0**	**$50,000**	**$97,000**	**$93,000**

Alternative Number 3 - Institutional Controls; Landfill Cover Repair, Maintenance, and Drainage Improvements; and 5-Year Review

Alternative Number 3					
Year	**Capital Costs ($)**	**Annual O&M Costs ($)**	**Periodic Costs ($)**	**Total Annual Cost ($)**	**Present Value at 1.9% ($)**
0	$449,000	$0	$0	$449,000	$449,000
1	$0	$10,000	$0	$10,000	$10,000
2	$0	$10,000	$0	$10,000	$10,000
3	$0	$10,000	$0	$10,000	$10,000
4	$0	$10,000	$0	$10,000	$10,000
5	$0	$10,000	$50,000	$60,000	$55,000
Total	**$449,000**	**$50,000**	**$50,000**	**$549,000**	**$544,000**

Tetra Tech EM Inc.

Calculation Worksheet for Cost Opinions

J/N: **Sheet:** 1 **of** 1

Project
Point Mugu Feasibility Study

Prepared by:	Date:	Checked by:	Date:
ATH	10-09-02	JTH	12-09-02

Description: Institutional Controls	Qty	Unit	Unit Cost	Labor	Equipment	Material
Location Factors (RS Means)						
Material: 105.2%						
Equipment: 112.4%						
Land Use Restrictions						
1 Regional Shore Infrastructure Plan	1	lump sum	$10,000.00	$10,000.00		
1 Memorandum of Agreement (includes negotiations with the state)	1	lump sum	$15,000.00	$15,000.00		
Loaded Costs						
Professional Labor Multiplier: 2.8						
Contractor Overhead and Profit, Fixed Overhead, and Insurance: 55%						
Taxes on Equipment and Materials, Ventura County: 8.250%						

Davis-Bacon and P-Level Summary

Category	Code	Hours	Direct	Fringe

	Labor	Equipment	Material
Total A Unloaded Costs	$25,000.00	$0.00	$0.00
Total B Unloaded Design Costs	$0.00		
Total C Loaded Costs	$38,750.00	$0.00	$0.00
Total w/20% Contingency	**$46,500.00**	**$0.00**	**$0.00**

TOTAL ROUNDED COST **$47,000**

Tetra Tech EM Inc.

Calculation Worksheet for Cost Opinions

J/N: **Sheet:** 1 **of** 1

Project
Point Mugu Feasibility Study

Prepared by:	Date:	Checked by:	Date:
ATH	10-09-02	JTH	12-09-02

Description: Five Year Review	Qty	Unit	Unit Cost	Labor	Equipment	Material
Location Factors (RS Means)						
Material: 105.2%						
Equipment: 112.4%						
Site Inspection and Interviews						
1 Project Manager (P-4)	40	hour	$42.00	$1,680.00		
1 Field Technician (P-2)	40	hour	$22.00	$880.00		
Tavel to the site (2 people)	2	each	$500.00			$1,000.00
Lodging and Per Diem						
Lodging: $118.00						
Per Diem: $38.00						
Total Number of Personnel: 2	10	day	$156.00			$1,560.00
Tax is not applicable to lodging and per diem.						
Preparation of Report						
Duration: 120 hours						
1 Project Manager (P-4) 25%	30	hour	$42.00	$1,260.00		
1 Project Engineer (P-4) 15%	18	hour	$42.00	$756.00		
1 Project Geologist (P-4) 15%	18	hour	$42.00	$756.00		
1 Project Scientist (P-4) 15%	18	hour	$42.00	$756.00		
1 Staff Engineer (P-2) 100%	120	hour	$22.00	$2,640.00		
1 Staff Scientist (P-2) 100%	120	hour	$22.00	$2,640.00		
1 GIS Specialist (P-3) 50%	60	hour	$28.00	$1,680.00		
1 Word Processing/Clerical 15%	18	hour	$16.00	$288.00		
1 Draftsman/CADD 20%	24	hour	$14.00	$336.00		
Loaded Costs						
Professional Labor Multiplier: 2.8						
Contractor Overhead and Profit, Fixed Overhead, and Insurance: 55%						
Taxes on Equipment and Materials, Ventura County: 8.250%						

Davis-Bacon and P-Level Summary

Category	Code	Hours	Direct	Fringe

	Labor	Equipment	Material
Total A Unloaded Costs	$13,672.00	$0.00	$2,560.00
Total B Unloaded Design Costs	$0.00		
Total C Loaded Costs	$38,281.60	$0.00	$2,642.50
Total w/20% Contingency	**$45,937.92**	**$0.00**	**$3,171.00**

TOTAL ROUNDED COST **$50,000**

Tetra Tech EM Inc.

Calculation Worksheet for Cost Opinions

J/N: **Sheet:** 1 **of** 2

Project
Point Mugu Feasibility Study

Prepared by:	Date:	Checked by:	Date:
ATH	10-09-02	JTH	12-09-02

Description: Landfill Cover Repair and Drainage Improvements	Qty	Unit	Unit Cost	Labor	Equipment	Material
Location Factors (RS Means)						
Material: 105.2%						
Equipment: 112.4%						
Landfill Area: 18.0 acres						
Landfill Area Covered with Chip Seal: 7 acres						
Landfill Area to be Graded: 11.0 acres						
Assume:						
Landfill Area without Chip Seal: 479,160 feet squared						
1/3 of the Landfill Requiring Fill and Grading: 159,720 feet squared						
1 foot of cover						
Soil Volume Required for Grading: 5,916 CY						
Borrow Area						
Common Earth, Shovel, 3 CY Bucket (Means 02315 200 4070)						
Crew: B-10T						
Hourly Output: 50 CY (~25% of cited output)						
Common Earth	5,916	CY	$7.21			$42,628.68
1 Medium Equipment Operator	118	hour	$31.20	$3,691.31		
0.5 Laborer	59	hour	$23.45	$1,387.20		
1 Front End Loader, W.M., 3 CY	15	day	$416.33		$6,244.94	
Delivery						
Hauling borrow fill, 20 C.Y. dump trailer (Means 02320 200 1150)						
Crew: B-34D						
Hourly Output: 20 CY (~40% of cited output)						
2 Truck Tractor, 40 Ton	19	day	$431.17		$8,192.16	
2 Heavy Truck Driver	148	hour	$25.00	$3,697.22		
2 Dump Trailer, 20 C.Y.	19	day	$145.00	$2,754.92		
Landfill Area						
Spread from pile to rough finish grade, F.E. loader, 1.5 C.Y. (Means 02310 460 0400)						
Crew: B-10S						
Hourly Output: 50 CY (~25% of cited output)						
2 Medium Equipment Operator (additional operator for Dozer/Scraper)	237	hour	$31.20	$7,382.61		
0.5 Laborer	59	hour	$23.45	$1,387.20		
1 F.E. Loader, W.M., 1.5 C.Y.	15	day	$310.67		$4,660.10	
1 Dozer, 410 H.P. (added to original crew)	15	day	$1,544.38		$23,165.64	
1 Scraper, Towed, 7 C.Y. (added to original crew)	15	day	$138.65		$2,079.68	
Drainage Improvements						
Assume all divets and potholes will be addressed during rough grading.						
Equipment Mobilization/Demobilization						
1 Front End Loader, W.M., 3 CY	2	each	$100.00		$200.00	
2 Truck Tractor, 40 Ton	2	each	$100.00		$200.00	
1 Grader, Motor, 14-G, Articulated	2	each	$100.00		$200.00	
1 Dozer, 410 H.P. (added to original crew)	2	each	$100.00		$200.00	
1 Scraper, Towed, 7 C.Y. (added to original crew)	2	each	$100.00		$200.00	
2 Dump Trailer, 20 C.Y.	2	each	$100.00		$200.00	

Davis-Bacon and P-Level Summary

Category	Code	Hours	Direct	Fringe

Total A Unloaded Costs		See Next Page	
Total B Unloaded Design Costs		See Next Page	
Total C Loaded Costs		See Next Page	

Tetra Tech EM Inc.

Calculation Worksheet for Cost Opinions

J/N: **Sheet:** 2 **of** 2

Project
Point Mugu Feasibility Study

Prepared by:	Date:	Checked by:	Date:
ATH	10-09-02	JTH	12-09-02

Description: Landfill Cover Repair and Drainage Improvements	Qty	Unit	Unit Cost	Labor	Equipment	Material
Personnel Mobilization/Demobilization						
Total Hours per Staff: 16 hour						
1 Project Manager (P-4)	16	hour	$42.00	$672.00		
1 Superintendent (P-4)	16	hour	$42.00	$672.00		
1 Enginner (P-3)	16	hour	$28.00	$448.00		
1 Health & Safety Officer (P-2)	16	hour	$22.00	$352.00		
1 Quality Control Officer (P-2)	16	hour	$22.00	$352.00		
Distributive Costs						
1 Project Manager (P-4) 100% time	160	hour	$42.00	$6,720.00		
1 Superintendent (P-4) 100% time	160	hour	$42.00	$6,720.00		
1 Enginner (P-3) 100% time	160	hour	$28.00	$4,480.00		
1 Health & Safety Officer (P-2) 100% time	160	hour	$22.00	$3,520.00		
1 Quality Control Officer (P-2) 100% time	160	hour	$22.00	$3,520.00		
Lodging and Per Diem						
Lodging: $118.00						
Per Diem: $38.00						
Total Number of Personnel: 5	100	day	$156.00			$15,600.00
Tax is not applicable to lodging and per diem.						
Design Costs						
12% of total unloaded costs $19,040.12						
Construction Oversight						
1 Oversight Personnel (P-2)	160	hour	$22.00	$3,520.00		
Lodging and Per Diem	20	day	$156.00			$3,120.00
Tax is not applicable to lodging and per diem.						
Travel to the Site	1	lump sum	$500.00			$500.00
Loaded Costs						
Professional Labor Multiplier: 2.8						
Contractor Overhead and Profit, Fixed Overhead, and Insurance: 55%						
Taxes on Equipment and Materials, Ventura County: 8.250%						

Davis-Bacon and P-Level Summary

Category	Code	Hours	Direct	Fringe

	Labor	Equipment	Material
Total A Unloaded Costs	$51,276.46	$45,542.53	$61,848.68
Total B Unloaded Design Costs	$19,040.12		
Total C Loaded Costs	$220,553.06	$49,299.79	$65,406.79
Total w/20% Contingency	**$264,663.67**	**$59,159.75**	**$78,488.15**

TOTAL ROUNDED COST **$403,000**

Tetra Tech EM Inc.

Calculation Worksheet for Cost Opinions

J/N: **Sheet:** 1 **of** 1

Project
Point Mugu Feasibility Study

Prepared by:	Date:	Checked by:	Date:
ATH	10-09-02	JTH	12-09-02

Description: Landfill Maintenance	Qty	Unit	Unit Cost	Labor	Equipment	Material
Location Factors (RS Means)						
Material: 105.2%						
Equipment: 112.4%						
Semiannual Inspections:						
Two Semiannual Inspections per Year (quantity represents total per year)						
All costs are based on a general laborer unless otherwise noted.						
Inspect signs and gates	2	hour	$23.45	$46.90		
Visual cover walk	2	hour	$23.45	$46.90		
Final grading walk	2	hour	$23.45	$46.90		
Wildlife search (P-3)	2	hour	$28.00	$56.00		
Drainage erosion check	2	hour	$23.45	$46.90		
Gas vents inspection	2	hour	$23.45	$46.90		
Quarterly Inspections:						
Four Quarterly Inspections per Year (quantity represents total per year)						
Quarterly inspections are conducted concurrent with semi-annual inspections.						
All costs are based on a general laborer unless otherwise noted.						
Inspect signs and gates	2	hour	$23.45	$46.90		
Visual cover walk	2	hour	$23.45	$46.90		
Final grading walk	2	hour	$23.45	$46.90		
Wildlife search (P-3)	2	hour	$28.00	$56.00		
Gas vents inspection	2	hour	$23.45	$46.90		
Monthly Inspections:						
Twelve Monthly Inspections per Year (quantity represents total per year)						
Monthly inspections are conducted concurrent with semi-annual and quarterly inspections.						
Cost is based on a general laborer.						
Inspect signs and gates	8	hour	$23.45	$187.60		
Miscellaneous Site Maintenance:						
Ambient Air Sampling						
Seven samples per year						
Field Sampler (P-2)	7	hour	$22.00	$154.00		
Photoionization Detector	7	day	$134.88		$944.16	
Micellaneous Maintenance Materials	1	lump sum				$2,000.00
Reporting						
Engineer (P-3)	40	hour	$28.00	$1,120.00		
Design Costs						
12% of total unloaded costs $592.78						
Loaded Costs						
Professional Labor Multiplier: 2.8						
Contractor Overhead and Profit, Fixed Overhead, and Insurance: 55%						
Taxes on Equipment and Materials, Ventura County: 8.250%						
Total A Unloaded Costs				$1,995.70	$944.16	$2,000.00
Total B Unloaded Design Costs				$592.78		
Total C Loaded Costs				$4,825.84	$1,022.05	$2,165.00
Total w/20% Contingency				**$5,791.00**	**$1,226.46**	**$2,598.00**

Davis-Bacon and P-Level Summary

Category	Code	Hours	Direct	Fringe

TOTAL ROUNDED COST **$10,000**