Final

Site Inspection Report for the Mare Island Elementary School

Former Mare Island Naval Shipyard Vallejo, California

June 26, 2006

Prepared for:
Base Realignment and Closure
Program Management Office West
San Diego, California

Prepared by:
Sullivan Consulting Group and Tetra Tech EM Inc.
San Diego, California

Prepared under:
Naval Facilities Engineering Command
Contract Number N68711-03-C-5004
Contract Line Item Number 0001

DT 110-01.29

Final

Site Inspection Report for the Mare Island Elementary School
Former Mare Island Naval Shipyard
Vallejo, California

Contract Line Item Number 001
DT 110-01.29

Prepared for:

DEPARTMENT OF THE NAVY

REVIEW AND APPROVAL

Project Manager: Michael Foster, Ph.D., P.G.
Sullivan Consulting Group
Date: 6/26/06

Project Manager: Allison Mensinger
Tetra Tech EM Inc.
Date: 6/26/06

TABLE OF CONTENTS

REVIEW AND APPROVAL i

ACRONYMS AND ABBREVIATIONS vi

EXECUTIVE SUMMARY ES-1

1.0 INTRODUCTION 1

1.1 BACKGROUND 1

1.2 PURPOSE AND OBJECTIVES 2

1.3 RECENT SAMPLING EVENTS 2

1.3.1 Scope of Work for the November 2002 Sampling 2

1.3.2 Scope of Work for the August 2003 Sampling 2

1.4 REPORT ORGANIZATION 3

2.0 REGULATORY FRAMEWORK 4

2.1 REGULATORY PROCESS AND PLANNING 4

2.2 COMPARISON CRITERIA FOR SAMPLE RESULTS 4

2.3 WORK PLANS FOR SITE INSPECTION SAMPLING EVENTS 5

2.3.1 Notification of November 2002 Sampling 5

2.3.2 Sampling and Analysis Plan for August 2003 Sampling 6

3.0 SITE CONDITIONS 6

3.1 SITE LOCATION 6

3.2 SITE BACKGROUND 6

3.2.1 Geology 6

3.2.2 Hydrogeology 7

3.2.3 Climate 7

3.2.4 Topography 8

3.2.5 Surface Water 8

3.3 SITE HISTORY 8

3.4 POTENTIAL EXPOSURE PATHWAYS 9

3.4.1 Soil 9

3.4.2 Groundwater 9

3.4.3 Air 10

3.4.4 Surface Water 10

3.5 SUMMARY OF PREVIOUS INVESTIGATIONS 10

3.5.1 Phase I: Mare Island Elementary School and WAVES Barracks Toxic Soil Testing and Analysis Report (Chlordane) 10

3.5.2 Mare Island Naval Shipyard: Buildings 735 and 765 Preliminary Endangerment Assessment 11

3.5.3 Focused Human Health Risk Assessment for Buildings 735 and 765.....11
3.5.4 Preliminary Assessment/Site Inspection Final Summary Report for Nonradiological Sites.....11
3.5.5 Draft Final Remedial Investigation Report, Operable Unit 2.....12
3.5.6 Interim Facilitywide Groundwater Monitoring Program Quarterly Report13
3.5.7 Basewide Polychlorinated Biphenyl Confirmation Sampling Summary Report.....13
3.5.8 Vallejo Unified School District Report on Limited Soil and Water Sampling at the Mare Island Elementary School.....13
3.5.9 Final Closure Report, Underground Fuel Oil Piping and TPH-Contaminated Soil Removal.....14
3.5.10 Human Health Risk Assessment on Greensand at Mare Island Elementary School, Addendum to the Final Technical Memorandum.....14
3.5.11 Preliminary Endangerment Assessment, Existing Mare Island Elementary School, 400 9th Street.....15
3.5.12 CH2M HILL Confirmation Sampling.....16
3.5.13 Summary of Regulatory and Restoration Advisory Board Meetings.....16
4.0 NOVEMBER 2002 SAMPLING EVENT.....17
4.1 NOVEMBER 2002 SAMPLING METHODS.....17
4.1.1 Investigation Approach.....17
4.1.2 Rationale for Selecting Analytical Parameters.....18
4.1.3 Sampling Methods and Equipment Used.....18
4.1.4 Field Variances to the Sampling and Analysis Plan.....20
4.1.5 Site Restoration.....20
4.2 RESULTS FROM THE NOVEMBER 2002 SAMPLING EVENT.....20
4.2.1 Soil Sampling Results.....20
4.2.2 Groundwater Sampling Results.....22
4.2.3 Investigation-Derived Waste.....23
5.0 AUGUST 2003 SAMPLING EVENT AND THE 9TH STREET AND TISDALE AVENUE REMOVAL ACTION.....23
5.1 AUGUST 2003 SAMPLING METHODS.....23
5.1.1 Investigation Approach.....24
5.1.2 Rationale for Selecting Analytical Parameters.....24
5.1.3 Sampling Methods and Equipment Used.....24
5.1.4 Field Variances to the Sampling and Analysis Plan Addendum.....25
5.1.5 Site Restoration.....25

TABLE OF CONTENTS (CONTINUED)

5.2 RESULTS FROM THE AUGUST 2003 SAMPLING EVENT 25
5.2.1 Soil Sampling Results 26
5.2.2 Groundwater Sampling Results 26
5.2.3 Investigation-Derived Waste 27
5.3 REMEDIAL ACTION AT THE 9TH STREET AND TISDALE AVENUE SITE 27
5.3.1 Remedial Action Summary 27
5.3.2 Conceptual Site Model 29
5.3.3 Site Closure 30
6.0 CONCLUSIONS AND RECOMMENDATIONS 30
6.1 SOIL 30
6.1.1 Inorganic Chemicals in Soil 31
6.1.2 Organic Chemicals in Soil 31
6.2 GROUNDWATER 33
6.2.1 Inorganic Chemicals in Groundwater 33
6.2.2 Organic Chemicals in Groundwater 33
6.3 AIR 34
6.4 SURFACE WATER 34
6.5 RECOMMENDATIONS FOR THE MARE ISLAND ELEMENTARY SCHOOL 34
7.0 REFERENCES 35

Appendix

A Analytical Results from Previous Investigations

B Analytical Results from Recent Sampling Events

C Waste Documentation

D Photographs

E Boring Logs

F Responses to Regulatory Agency Comments on the Draft Site Inspection Report

FIGURES

1 Regional Vicinity Map

2 Sampling and Visual Inspection Locations for November 2002

3 Locations with Chemical Concentrations Exceeding Comparison Criteria for Nov. 2002

4 Sampling Locations for August 2003 Prior to Remediation

5 TPH in Soil Prior to Remediation

6 TPH in Groundwater Post-Remediation

7 TPH in Soil Post-Remediation

8 Geologic Cross Section and Conceptual Site Model

TABLES

1 Selection of Comparison Criteria

2 Comparison Criteria for Soil and Groundwater

3 Sampling Locations, Analyses, and Rationale for the November 2002 Sampling Event

4 Statistical Summary of the November 2002 Soil Sample Results

5 Statistical Summary of the November 2002 Groundwater Sample Results

6 Sampling Locations, Analyses, and Rationale for the August 2003 Sampling Event

7 Statistical Summary of the August 2003 Soil Sample Results

8 Statistical Summary of the August 2003 Groundwater Sample Results

ACRONYMS AND ABBREVIATIONS

µg/L	Microgram per liter
AST	Aboveground storage tank
bgs	Below ground surface
BHC	Benzene hexachloride
BTEX	Benzene, toluene, ethylbenzene, and xylene
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DDE	Dichlorodiphenyldichloroethene
DDT	Dichlorodiphenyltrichloroethane
DTSC	Department of Toxic Substances Control
EPA	U.S. Environmental Protection Agency
ESL	Environmental screening level
Foster Wheeler	Foster Wheeler Environmental Corporation
HHRA	Human health risk assessment
IDW	Investigation-derived waste
IR	Installation Restoration
LMI	Lennar Mare Island, LLC
mg/kg	Milligram per kilogram
mg/L	Milligram per liter
MTBE	Methyl tertiary butyl ether
Navy	U.S. Department of the Navy
PAH	Polynuclear aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PEA	Preliminary endangerment assessment
PID	Photoionization detector
PRC	PRC Environmental Management, Inc.
PRG	Preliminary remediation goal
RAB	Restoration Advisory Board
RI	Remedial investigation
SAP	Sampling and analysis plan
SI	Site inspection

ACRONYMS AND ABBREVIATIONS (Continued)

SOP	Standard operating procedure
SVOC	Semivolatile organic compound
Tetra Tech	Tetra Tech EM Inc.
TPH	Total petroleum hydrocarbons
TPH-dr	Total petroleum hydrocarbons as diesel range
TPH-mr	Total petroleum hydrocarbons as motor oil range
TTLC	Total threshold limit concentration
UST	Underground storage tank
VUSD	Vallejo Unified School District
VOC	Volatile organic compound
Water Board	Regional Water Quality Control Board
WAVES	Women Accepted for Volunteer Emergency Service

EXECUTIVE SUMMARY

This document presents the results of a site inspection at the Mare Island Elementary School site at Mare Island, in Vallejo, California. The site inspection summarizes (1) all previous investigations at the Mare Island Elementary School and (2) results of sampling activities conducted at the site in November 2002 and August 2003. The site inspection presents conclusions regarding whether contaminants from the Mare Island Elementary School site are being released to the environment. Recommendations presented in the document are based on all of the data and investigations completed to date at the site.

The school site is located in the central portion of the former Mare Island Naval Shipyard. The U.S. Department of the Navy (Navy) historically used a portion of the site for fuel storage. Built in 1932, aboveground storage tank (AST) 636 and the associated underground fuel transfer system were located within the school site. AST 636 was rebuilt as a transducer test facility in 1964 and used only to store water until it was deconstructed around 1978. Underground storage tank (UST) 772, which was built in 1942, was located on the property adjacent to the school to the north and was deconstructed in 1997. UST 772 and the underground fuel transfer system associated with AST 636 were removed as part of the Navy's environmental restoration program. Since 1952, a public elementary school has occupied most of the school site. The Navy currently owns the school property and is planning to transfer the property to the Department of Education for subsequent transfer to the Vallejo Unified School District under a Public Benefit Conveyance.

PREVIOUS INVESTIGATIONS

The following previous soil and groundwater investigations were conducted at the school site.

- **Phase I: Mare Island Elementary School and Women Accepted for Volunteer Emergency Service (WAVES) Barracks Toxic Soil Testing and Analysis Report (Chlordane).** The report concluded that chlordane contamination had not measurably migrated laterally or vertically from the areas where termiticide was applied.

- **Mare Island Naval Shipyard: Buildings 735 and 765 Preliminary Endangerment Assessment.** The preliminary assessment report further recommended that a human health risk assessment (HHRA) be conducted to evaluate if current conditions at the former building sites posed an actual threat to human health.

- **Focused Human Health Risk Assessment for Buildings 735 and 765.** The focused HHRA concluded that chlordane concentrations detected at Buildings 735 and 765 were on the low range of residual concentrations presented in other chlordane studies and that risks estimated at the site were likely to be similar to risks associated with residual chlordane concentrations in other areas where chlordane was applied using similar application procedures during the same time period.

- **Preliminary Assessment/Site Inspection Final Summary Report for Nonradiological Sites**. Based on the preliminary assessment/site inspection, the report concluded that no further investigation or action was warranted for the school site.

- **Draft Final Remedial Investigation Report, Operable Unit 2.** Analytical results indicated that petroleum hydrocarbons were present in soils at the area near former AST 636. Based on the fate and transport evaluation for Installation Restoration Site 23, it was concluded that total petroleum hydrocarbon (TPH) constituents detected at the site would likely be affected by dispersion and degradation and were expected to attenuate naturally over time.

- **Interim Facilitywide Groundwater Monitoring Program Quarterly Report**. Results of the quarterly groundwater sampling indicated that TPH contamination associated with tank releases was not present at concentrations exceeding groundwater screening criteria.

- **Basewide Polychlorinated Biphenyl Confirmation Sampling Summary Report.** The summary report concluded that polychlorinated biphenyls (PCB) posed no unacceptable risk to human health or the environment and no further action was recommended.

- **Vallejo Unified School District Report on Limited Soil and Water Sampling at the Mare Island Elementary School.** The report indicated detectable levels of low-level gross alpha and gross beta radioactivity in soil and tap water samples; therefore, no further investigation was recommended at the school site.

- **Final Closure Report, Underground Fuel Oil Piping and TPH-Contaminated Soil Removal.** The Department of Toxic Substances Control concurred with the conclusions of the final summary report on November 14, 2002, agreeing that the removal action had met the intended objectives.

- **Human Health Risk Assessment on Greensand at Mare Island Elementary School, Addendum to the Final Technical Memorandum**. Results of the HHRA did not identify an unacceptable risk to children or adults. Because this HHRA focused on the removed soil and greensand and not the soils present at the school site, the regulatory agencies requested additional samples be collected at the school site to evaluate the risk to human health from the remaining soil.

- **Preliminary Endangerment Assessment, Existing Mare Island Elementary School, 400 9th Street**. Results of the sampling indicated that the sum of the cancer risks estimated for soil ingestion, dermal contact, and inhalation exceeded the target cancer risk level and that elevated concentrations of TPH were from residual contamination following prior remediation activities.

- **CH2M HILL Confirmation Sampling**. Results indicated that TPH concentrations exceeded comparison criteria within the school property line but outside of the playground fence. As a result, contaminated soil was removed, confirmation samples were collected, and the area was filled.

- **Summary of Regulatory and Restoration Advisory Board Meetings.** Meetings between the Navy and the regulatory agencies were held for the purposes of coordinating efforts and soliciting comments on the school site.

NOVEMBER 2002 SAMPLING EVENT

The purpose of the November 2002 sampling event was to determine if additional investigation was necessary at the school site or if the site was ready for property transfer. The specific objectives of the November 2002 sampling event were to (1) delineate the extent of greensand beneath the grassy playground area and (2) confirm that chemicals are not present at unacceptable concentrations in soil or groundwater. To achieve these objectives, 90 soil borings from the grassy playground area were visually screened for the presence of greensand. Fifty-four soil samples were collected from exposed areas of the site, including the grassy playground and landscaped areas. Some of the soil sampling locations were chosen near the drip line of the school buildings to address potential lead-based paint concerns identified by the regulatory agencies. In addition, one groundwater sample was collected from each of the two existing groundwater monitoring wells at the site. All soil and groundwater samples were analyzed by an off-site laboratory for the full suite of potential contaminants under the Comprehensive Environmental Response, Compensation, and Liability Act, including metals, hexavalent chromium, volatile organic compounds (VOC), semivolatile organic compounds (SVOC), pesticides, PCBs, and fuels (TPH).

Results of the November 2002 sampling event did not identify greensand in any of the soil borings from the grid locations in the grassy playground area or from the soil samples collected for chemical analyses. Analytical results for metals in soil samples were evaluated using comparison criteria, which consisted of the higher of the residential preliminary remediation goal (PRG) or Mare Island ambient soil concentration. Except for TPH, all other analytical results for soil samples were compared to residential PRGs; alternative criteria were used for TPH because no PRG or ambient concentrations exist. Results of the evaluation of soil samples identified two locations with metals concentrations exceeding comparison criteria and two locations with TPH concentrations exceeding comparison criteria. Concentrations of hexavalent chromium, VOCs, SVOCs, pesticides, and PCBs were not detected in any soil samples above comparison criteria. The following table summarizes the results of the locations and chemicals that were detected in soil samples at concentrations above comparison criteria.

Compound	Location	Sample Depth (feet bgs)	Concentration (mg/kg)	Comparison Criteria (mg/kg)
Inorganic Compounds				
Iron	ELEMGB015	1.5	45,800	44,000[a]
Lead	ELEMGB003	1.5	620	210[b]
Vanadium	ELEMGB015	1.5	141	130[a]
Petroleum Indicators				
TPH-dr	ELEMGB007	0	470	400[c]
	ELEMGB009	0	960	400[c]
TPH-mr	ELEMGB009	0	810	400[c]

Notes:

a The comparison criteria for iron and vanadium is the Mare Island ambient native soil concentration (Tetra Tech EM Inc. 2002b).

b The comparison criteria for lead is the Mare Island site-specific lead PRG calculated using the "LeadSpread Risk Assessment Spreadsheet, Version 7 for estimating blood-lead concentrations" (Tetra Tech EM Inc. 2001; Department of Toxic Substances Control 1999).

c Source: PRC Environmental Management, Inc. 1997b. "Draft Final Group II and III Accelerated Study Field Sampling and Analysis Plan, Mare Island, Vallejo, California." August 5.

bgs Below ground surface
mg/kg Milligram per kilogram
TPH-dr Total petroleum hydrocarbons as diesel range
TPH-mr Total petroleum hydrocarbons as motor oil range

The maximum concentration of iron exceeded the Mare Island ambient concentration for native soils, but the concentration is below the Mare Island ambient fill concentration of 62,000 milligrams per kilogram (mg/kg). The maximum concentration of vanadium exceeded the Mare Island ambient concentration for native soils, but the concentration is below the Mare Island ambient fill concentration of 190 mg/kg. The school site is within the original boundary of Mare Island; therefore, ambient native soil concentrations initially were expected to be the most appropriate criteria to use for comparison. However, results of previous investigations and site observations indicated that the surface materials at the site were more characteristic of construction fill material than native soils. The sample with elevated iron and vanadium concentrations was collected directly adjacent to Building 2001; therefore, more appropriate comparison criteria for iron and vanadium would likely be concentrations that are between the concentrations that represent native soil and ambient fill. Because concentrations of iron or vanadium in the other 53 samples were less than comparison criteria, and the average iron and vanadium concentrations for the site (22,700 mg/kg and 46.5 mg/kg, respectively) were below PRGs, iron and vanadium are not likely to pose unacceptable risks to human health.

The maximum concentration for lead exceeded the Mare Island site-specific residential PRG for lead (Tetra Tech EM Inc. 2001). The sample with the elevated lead concentration was collected from the grassy playground area at 1.5 feet bgs. Because lead concentrations in the other 53 samples were less than the comparison criterion, and the average concentration for the site (31.1 mg/kg) was below the PRG, lead is not likely to pose unacceptable risks to human health.

TPH as diesel range (TPH-dr) concentrations exceeded the comparison criterion in two surface soil samples from locations ELEMGB007 (collected from the grassy playground area) and

ELEMGB009 (collected from the bare ground around the swing set). In addition, TPH as motor oil range (TPH-mr) also was detected above the comparison criterion at ELEMGB009.

If a person were to be exposed to TPH concentrations at the school site, a reasonable exposure would likely be the average concentrations at the site. The environmental screening level (ESL) developed by the Regional Water Quality Control Board (Water Board) for residential areas where groundwater is not a drinking water source is 100 mg/kg for TPH as gasoline range and 500 mg/kg for other TPH fractions (Water Board 2005). The ESL for noncarcinogens such as TPH represents a human health hazard quotient of 0.2 (adjusted down from 1.0) to allow for cumulative effects for up to five chemicals contributing to the hazard index. If the ESLs were adjusted to correspond with a hazard quotient of 1.0, the corresponding ESLs would be five times greater. These adjusted ESLs would be appropriate comparison criteria for the school site because this site was analyzed for the full suite of potential contaminants that could be contributing to any risk and average concentrations were below ambient or risk-based comparison criteria. The maximum and average TPH concentrations at the school site are significantly less than the adjusted ESLs; therefore, TPH concentrations at the site are not likely to pose unacceptable risk to human health.

Analytical results for the two groundwater samples were evaluated using comparison criteria that consisted of the higher of the ambient water quality criteria or the Mare Island ambient groundwater concentration. Results of the analytical data for groundwater samples identified one location where heptachlor epoxide was detected at a concentration of 0.04 micrograms per liter (µg/L), which is above the comparison criterion of 0.0036 µg/L. Concentrations of metals, hexavalent chromium, VOCs, SVOCs, pesticides, PCBs, and TPH were not detected in any groundwater samples at concentrations above comparison criteria. Although heptachlor epoxide exceeded the comparison criteria in one well, concentrations in the other nearby monitoring well were not detected during the November 2002 sampling event. In addition, heptachlor epoxide concentrations from previous rounds of groundwater sampling only intermittently detected heptachlor epoxide above the comparison criterion. The exposure pathway for human ingestion of groundwater is not complete; therefore, concentrations of heptachlor epoxide do not pose an unacceptable risk to human health.

AUGUST 2003 SAMPLING EVENT

Results from the initial assessment conducted in November 2002 indicated that further investigation of the school site was not warranted. In early 2003, CH2M Hill discovered subsurface TPH on the property adjoining the school site and performed four investigations to assess the extent of the contamination (CH2M Hill 2003). Results of the investigations indicated that potential TPH contamination could exist at the school site. As a result, the Navy collected additional soil and groundwater samples in August 2003. The objective of the August 2003 sampling event was to assess whether TPH had migrated to the school site and, if it had migrated, how far it extends. To achieve this objective, eight step-out soil borings were completed on the western edge of the school site. Three soil samples were collected from each soil boring and analyzed for TPH. One of the three samples collected was also analyzed for

polynuclear aromatic hydrocarbons (PAH). In addition, one grab groundwater sample was collected from each boring location.

Results of the soil samples analyzed for PAHs were evaluated using residential PRGs. Alternative criteria were used for TPH because no PRG or ambient concentrations exist. TPH-dr exceeded the comparison criterion of 400 mg/kg in one soil sample collected at ELEMGB030 at a depth of 19 to 20 feet below ground surface. All other step-out soil sample results were below comparison criteria for TPH and PAHs.

Soil removal activities were conducted by CH2M Hill for the 9th Street and Tisdale Avenue site in August and September 2003 and included the western portion of the school site property, near where the elevated concentrations of TPH were originally found. Analysis of confirmation samples collected after the soil excavation revealed two locations within the school site property with TPH concentrations that exceeded comparison criterion. The topography and slope stability of the area around these locations did not allow for over-excavation of the soil in these hot spots; therefore, the soil was left in place. These sample locations are considered isolated detections because surrounding samples did not exhibit similar concentrations. In addition, the residual TPH left in place was identified between 6 and 10 feet below ground surface (now 15 feet below current ground surface).

Although TPH concentrations in three samples collected at the school site in August 2003 exceeded the TPH comparison criteria, average TPH concentrations at the site were below ambient and risk-based comparison criteria and the maximum and average TPH concentrations at the school site are significantly less than the adjusted ESLs developed by Water Board (2005). In addition, following the completion of the soil removal activities minimal further migration of the residual contamination onto the school site is anticipated based on the absence of free-product, the limited permeability of the soils, and the bedrock-dredge material interface that dips generally westwards away from school site towards the 9th Street and Tisdale Avenue site remediated by CH2M Hill. Therefore, TPH concentrations at the site are not likely to pose unacceptable risk to human health.

Analytical results for the groundwater samples collected in August 2003 were evaluated using comparison criteria that consisted of the higher of the ambient water quality criteria or the Mare Island ambient groundwater concentration. TPH exceeded the comparison criterion of 1.4 milligrams per liter in one grab groundwater sample. Groundwater concentrations were also compared with ESLs developed by the Water Board (2005). Results indicated that TPH-mr exceeded the final ESL based on ceiling value and the ESL based on the drinking water toxicity value in seven and five samples, respectively. However, TPH-mr concentrations exceeded the final ESL for nondrinking water in only one sample. Results also indicated that TPH-dr exceeded the final ESL based on ceiling value and the ESL based on the drinking water toxicity value in one sample. However, TPH-dr concentrations did not exceed the final ESL for nondrinking water.

Eight monitoring wells and four temporary monitoring points were completed by CH2M Hill on the 9th Street and Tisdale Avenue site. TPH was not detected in any groundwater samples

collected from the monitoring wells; however, it was detected in samples collected from three of the four temporary monitoring points.

Although TPH exceeded the Mare Island groundwater comparison criterion in one sampling location on the school property, elevated concentrations in the other nearby locations were not detected during the August 2003 sampling event. The one sampling location with the maximum TPH-mr concentration exceeding the nondrinking water ESL does not appear to be representative of groundwater concentrations throughout the school site. In addition, TPH concentrations in groundwater samples collected by CH2M Hill from the monitoring wells installed closest to the school site and on the 9th Street and Tisdale Avenue site were below the detection limit for TPH. The exposure pathway for human ingestion of groundwater is not complete and concentrations of TPH compared to ESLs based on drinking water criteria are not representative of potential site exposure. As a result, groundwater does not pose an unacceptable risk to human health at the school site.

RECOMMENDATION

Based on the results of the November 2002 and August 2003 sampling events and all previous investigations at the school site, the SI concluded that all environmental issues have been resolved and no further investigation is warranted at the school site.

1.0 INTRODUCTION

This document presents the results of the site inspection (SI) conducted by the U.S. Department of the Navy (Navy) at the Mare Island Elementary School. This SI report summarizes the previous investigations at the Mare Island Elementary School and the results of sampling activities conducted at the site in November 2002 and August 2003 to provide data necessary to support the SI. This SI report also presents conclusions and recommendations for the Mare Island Elementary School based on all of the data and investigations completed to date at the site.

The site background, the purpose and objectives of the SI, recent sampling events at the site, and the organization of the report are discussed below.

1.1 BACKGROUND

The Mare Island Naval Shipyard was established in 1854, with the mission of shipbuilding, maintenance, and repair. The first ship built at the shipyard was constructed in 1858; shipbuilding, maintenance, and repair continued at the shipyard until the end of World War II. After World War II, the shipyard became one of the primary U.S. Naval facilities for construction, overhaul, and maintenance of submarines. In 1993, the shipyard was designated for closure under the Defense Base Closure and Realignment Act of 1990. Mare Island Naval Shipyard was closed on April 1, 1996, and the land is being transferred to various entities as part of the redevelopment program. The Navy currently owns the property where the Mare Island Elementary School is located. The Navy plans to transfer the property to the Department of Education, which will subsequently transfer the property to the Vallejo Unified School District under a Public Benefit Conveyance.

The SI was conducted at the request of the regulatory agencies to further characterize soil and groundwater concentrations at the school site. Based on the site history, previous sampling efforts were focused on only a few specific chemicals, including pesticides and total petroleum hydrocarbons (TPH). During a removal action at the school site in summer 2001, it was discovered that the Navy had previously used a sandblast abrasive material, known as "greensand", to backfill the areas around some of the fuel pipelines (Foster Wheeler Environmental Corporation [Foster Wheeler] 2001). Based on this discovery, the regulatory agencies questioned the adequacy of previous characterization of chemical concentrations at the school site. The regulatory agencies identified concerns about (1) the potential for additional greensand to be present near the surface beneath the grassy playground area and (2) the number of soil and groundwater samples with complete analytical results for potential contaminants under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). In response to the regulatory agencies' concerns, the Navy conducted a thorough review of previous Navy activities at the site to identify all potential sources of CERCLA contaminants. In addition, the Navy agreed to conduct further sampling in November 2002 to address agency concerns and to confirm concentrations of chemicals in soil and groundwater do not pose unacceptable risks to human health.

Results from the sampling conducted in November 2002 indicated that further investigation was not warranted. The draft SI report for the Mare Island Elementary School summarized the results of the November 2002 sampling and recommended no further action (Tetra Tech EM Inc. [Tetra Tech] 2003a). After the draft SI was completed, CH2M Hill, Lennar Mare Island, LLC's (LMI) contractor, discovered subsurface TPH contamination on the property adjoining the school site. As a result, the regulatory agencies requested that the Navy delineate potential TPH contamination at the school site. During August 2003, the Navy collected soil and groundwater samples to delineate the eastern extent of TPH contamination associated with the 9th Street and Tisdale Avenue site.

1.2 PURPOSE AND OBJECTIVES

The purpose of the SI for the school site was to determine if additional investigation of chemical concentrations in soil and groundwater is necessary or if the school site is ready for property transfer.

The objectives of the November 2002 sampling were to (1) delineate the extent of greensand beneath the grassy playground area and (2) confirm concentrations of chemicals in soil and groundwater at the site do not pose unacceptable risks to human health.

The objective of the August 2003 sampling was to assess whether TPH has migrated onto the school site from the 9th Street and Tisdale Avenue site and, if it has migrated to the site, how far it extends.

1.3 RECENT SAMPLING EVENTS

The following sections describe the work conducted as part of the recent sampling events at the school site.

1.3.1 Scope of Work for the November 2002 Sampling

The Navy delineated the extent of greensand by visually inspecting samples collected from soil borings that were advanced along a grid in the grassy playground area. Additionally, the Navy collected soil samples from six areas throughout the school site and groundwater samples from two existing monitoring wells. Both soil and groundwater samples were analyzed by an off-site laboratory for the full suite of CERCLA contaminants, including metals, hexavalent chromium, volatile organic compounds (VOC), semivolatile organic compounds (SVOC), pesticides, polychlorinated biphenyls (PCB), and TPH.

1.3.2 Scope of Work for the August 2003 Sampling

The Navy collected soil samples from eight soil boring locations along the western portion of the school site near the 9th Street and Tisdale Avenue site. Three soil samples were collected at each of the eight soil boring locations based on the results of field observations. The samples

were submitted to an off-site laboratory for analysis of TPH. In addition, one soil sample from each of the eight soil boring locations was analyzed for polynuclear aromatic hydrocarbons (PAH). A temporary well screen was installed in each soil boring location to collect one grab groundwater sample at each location. The groundwater samples were analyzed by an off-site laboratory for TPH.

1.4 REPORT ORGANIZATION

This document is divided into seven major sections.

- Section 1.0, Introduction – presents a brief overview of the site, purpose and objectives of the SI, the scope of work for the recent sampling events, and the report organization.
- Section 2.0, Regulatory Framework – provides the regulatory framework followed in the report, an overview of the comparison criteria used to evaluate soil and groundwater concentrations, and a summary of the work plans for the recent sampling events.
- Section 3.0, Site Conditions – describes the site conditions, including the site location, physical characteristics, site history, potential exposure pathways, and the previous site investigations.
- Section 4.0, November 2002 Sampling Event – describes the sampling process and presents the results of the visual inspection for greensand and analytical results of soil and groundwater samples collected in November 2002.
- Section 5.0, August 2003 Sampling Event and the 9th Street and Tisdale Avenue Removal Action – describes the sampling process and presents the analytical results of soil and groundwater samples collected in August 2003 and discusses a removal action conducted by CH2M Hill on an adjacent site known as the 9th Street and Tisdale Avenue site.
- Section 6.0, Conclusions and Recommendations – presents the conclusions and recommendations for the school site.
- Section 7.0, References – provides a list of the references used to prepare this report.

Figures and tables are presented after Section 7.0. The following appendices were used to prepare this report and are presented at the end of this report:

- Appendix A summarizes the analytical results from previous investigations at the school site.
- Appendix B presents the analytical results for soil and groundwater samples collected during the November 2002 and August 2003 sampling events.

- Appendix C presents the investigation-derived waste (IDW) results and waste manifests from the November 2002 and August 2003 sampling events.
- Appendix D contains general photographs of the site and photographs taken during the sampling events.
- Appendix E contains boring logs from the November 2002 and August 2003 sampling events.
- Appendix F presents the responses to regulatory agency comments received on the draft SI report (Tetra Tech 2003a).

2.0 REGULATORY FRAMEWORK

The following sections describe the regulatory authorities providing oversight for the SI, the criteria used to evaluate chemical concentrations in soil and groundwater samples collected from the site, and the work plans that were prepared for the sampling activities in support of the SI.

2.1 REGULATORY PROCESS AND PLANNING

Under Executive Order 12580, the Navy is the lead agency responsible for cleanup efforts on Navy property. The Department of Toxic Substances Control (DTSC), California Regional Water Quality Control Board (Water Board), and the U.S. Environmental Protection Agency (EPA) provide oversight for the project.

The SI was prepared in accordance with the following EPA publications: "Guidance for Performing Site Inspections Under CERCLA" (EPA 1992) and "Improving Site Assessment: Combined PA/SI Assessments" (EPA 1999).

2.2 COMPARISON CRITERIA FOR SAMPLE RESULTS

Analytical results from laboratory analysis of soil and groundwater samples were compared with comparison criteria to assess if chemical concentrations are present at concentrations above criteria. Table 1 summarizes the process used to select comparison criteria for soil and groundwater. Table 2 lists the comparison criteria selected for soil and groundwater at the school site.

Lead concentrations were compared with the Mare Island site-specific residential preliminary remediation goal (PRG) calculated using the LeadSpread 7.0 model (Tetra Tech 2001; DTSC 1999). DTSC approved the Mare Island site-specific residential PRG for lead in 2002 (DTSC 2002d). Except for lead, inorganic chemical concentrations in the soil were compared with the higher of the following: (1) EPA 2004 Region IX residential PRGs (EPA 2002a) or (2) the Mare Island ambient concentration. The Mare Island ambient concentration is defined as the lower of the ambient native soil concentration (95th percentile) or the Mare Island ambient artificial fill concentration (95th percentile) to be conservative (Tetra Tech 2002b). For all metals, except

beryllium and copper, the ambient concentrations for native soils were less than the Mare Island ambient concentrations for artificial fill (Tetra Tech 2002b).

All organic chemical concentrations, except for TPH, were compared to EPA Region IX residential PRGs (EPA 2004). TPH concentrations in soil were compared with an alternative comparison criterion (PRC Environmental Management, Inc. [PRC] 1997b).

Inorganic chemical concentrations in groundwater were compared with the higher of the following: (1) Mare Island ambient concentrations in groundwater (95th percentile), or (2) the marine or freshwater chronic ambient water quality criteria (lower of the two values) based on the Water Board's "A Compilation of Water Quality Goals" (Water Board 2000). TPH in groundwater was compared with an alternative comparison criterion (PRC 1997b). Other organic chemical concentrations were compared with the lower of the marine and freshwater chronic ambient water quality criteria (Water Board 2000). The lower of 10 percent of the marine or 10 percent of the freshwater acute values were used if no chronic values are listed (Water Board 2000).

2.3 WORK PLANS FOR SITE INSPECTION SAMPLING EVENTS

The following sections describe the events that took place prior to performing sampling activities.

2.3.1 Notification of November 2002 Sampling

The Navy presented an overview of the proposed sampling activities at the school site at the November 2002 Restoration Advisory Board (RAB) meeting. During this meeting, the Navy participated in a question and answer session with the public.

A draft sampling and analysis plan (SAP) for the field investigation was submitted on November 18, 2002 (Tetra Tech 2002c). Before initiating sampling, the Navy, EPA, DTSC, Vallejo Unified School District (VUSD), and Tetra Tech held two conference calls on October 10 and November 21, 2002, to discuss the SAP (Tetra Tech 2002c) and resolve comments. During the calls, sampling locations, depths, analyses, and protocols were established. Field investigations were performed on November 24 and 25, 2002, and the final SAP was issued in December based on agreements reached during the conference calls.

In December 2002, a fact sheet describing the project was provided to school faculty and employees, parents of students at the elementary school, RAB members, and representatives from DTSC, the Water Board, and EPA (Navy 2002).

2.3.2 Sampling and Analysis Plan for August 2003 Sampling

A draft addendum to the draft final SAP was prepared and submitted to the agencies on July 30, 2003. The draft final addendum was submitted on August 18, 2003 (Tetra Tech 2003b). Field investigations were performed on August 19 and 20, 2003.

3.0 SITE CONDITIONS

The following sections describe the site location, site background, site history, potential exposure pathways, and the previous investigations conducted at the school site.

3.1 SITE LOCATION

Mare Island is located in Solano County, California, about 25 miles northeast of the City of San Francisco and to the west of the City of Vallejo along the northern San Francisco Bay (see Figure 1). The landmass that makes up Mare Island was originally an island, but has been modified by land reclamation to become a peninsula. The approximately 2,800-acre peninsula is roughly 3.5 miles long by 1.25 miles wide. The facility consists of about 1,400 acres of uplands and 1,400 acres of wetlands. The Mare Island Elementary School site is located in the central portion of Mare Island and is bordered by Cedar Avenue to the east, Tisdale Avenue to the west and north, and 9th Street to the south (see Figure 2) (street names and locations are based on 1998 facility maps).

3.2 SITE BACKGROUND

The Navy historically used a portion of the site for fuel storage. Built in 1932, aboveground storage tank (AST) 636 and the associated underground fuel transfer system were located within the school site (see Figure 2). AST 636 was rebuilt as a transducer test facility in 1964 and used only to store water until it was deconstructed around 1978. Built in 1942, underground storage tank (UST) 772 was located on the property adjacent to the school to the north (see Figure 2); UST 772 was deconstructed in 1997. UST 772 and the underground fuel transfer system associated with AST 636 were removed as part of the Navy's environmental restoration program. Since 1952, a public elementary school has occupied most of the school site. The following sections describe the geology, hydrogeology, climate, topography, and surface water conditions for the school site.

3.2.1 Geology

The two geologic units identified at Mare Island are (1) unconsolidated materials and (2) bedrock. The upper geologic unit is composed of unconsolidated materials of various lithologies. The uppermost portion of the unconsolidated materials consists of light brown sandy silt that ranges from 1 to 4 feet thick. Underlying the sandy silt is dark gray clayey silt that ranges from 2 to 7 feet thick. The clayey silt may be associated with the placement of a containment berm during construction of UST 772. South and west of UST 772, the brown

sandy silt layer is not present, and the uppermost portion of the unconsolidated materials is predominately dark gray clayey silt. Underlying the clayey silt is pale brown silty sand, possibly representing the weathered zone of the underlying bedrock (PRC 1997a).

The unconsolidated materials are underlain by bedrock that consists of pale brown sandstone, which is likely associated with the Panoche Formation underlying Mare Island. Bedrock occurs at about 15 feet below ground surface (bgs) in the southern end of the site and at about 25 feet bgs at the northern edge of the site (PRC 1997a).

The current geographic extent of the upland areas at Mare Island was increased through accretion of sediments and placement of artificial fill; however, the school site is located within the boundary of the original upland area that consists primarily of native soils. Native soils are present at about 30 to 35 feet above mean sea level. Construction and demolition of buildings and storage tanks likely resulted in placement of some fill material along the western portion of the school site to provide a level area for construction activities (PRC 1995c). Native soil was found at about 6 feet bgs during excavation activities performed in summer 2001, as documented in the final TPH removal closure report (Foster Wheeler 2002).

3.2.2 Hydrogeology

Three hydrogeologic units at Mare Island have been identified based on the lithologies of the geologic materials. The uppermost hydrogeologic unit is composed of coarse-grained, relatively permeable materials, such as sand and gravel, and is generally confined to the immediate area of former UST 772. The second hydrogeologic unit is the silty sand portion of the unconsolidated materials. Although silty sands are permeable, they generally exhibit relatively low hydraulic conductivities. The third hydrogeologic unit is the bedrock underlying the two other units and it also exhibits low hydraulic conductivity (PRC 1997a).

Groundwater at the school site does not discharge to any surface water body at the school site. The Navy considers groundwater to be unacceptable for beneficial uses, such as a drinking water source, because wells in the area surrounding the school site do not produce a sufficient pump rate (150 gallons per day) (PRC 1995b). Groundwater at the site was previously measured at depths ranging from 3.4 to 12.4 feet bgs and exhibited a high seasonal fluctuation (PRC 1997a). In general, the water table is highest during the wet season, November to April, and lowest during the dry season, May to October, and varies by about 2.5 to 5 feet annually (PRC 1997a).

3.2.3 Climate

Mild winters and summers characterize the local climate. Mean monthly temperatures range from 47 °F in January to 68 °F in July and August. The average annual precipitation is 25.2 inches, with the predominant amount occurring from November to March.

3.2.4 Topography

Except for the western portion of the property, where the school property slopes steeply down to meet Tisdale Avenue, the school site and the area surrounding it are relatively flat (as based on 1998 facility maps). Surface features at the site include school buildings, pavement and curbing, a paved playground area, and landscaped or grassy playground areas (see Figure 2).

3.2.5 Surface Water

No surface water bodies are located within the boundary of the school site. Mare Island Strait is located approximately 0.4 miles east, San Pablo Bay is approximately 0.55 miles west, and Carquinez Strait is approximately 1.8 miles south of the site (see Figure 2).

3.3 SITE HISTORY

The site currently contains three primary buildings (Buildings 864, 2000, and 2001), along with modular classroom structures referred to as Buildings 20, 21, 22, 23, 24, 25, 26, 27, 28, 28A, 29, and 29A (see Figure 2). Buildings 20 through 29 are individual classroom units constructed subsequent to 1995, and Buildings 28A and 29A are double-wide storage trailers that were moved to the site on an unknown date. The original portion of Building 864 (demolished in the early 1990s) was constructed in 1956 and consisted of multiple independently constructed classrooms designated Units A through F. Unit G of the Building 864 complex was constructed in the mid- to late 1970s and is still present at the site today. Buildings 2000 and 2001 were constructed in 1988 and 1989. The following table provides a timeline of the site history (including the presence of other structures at the site) and land uses for the school site.

Timeframe	Land Use of School Site	Comments
1854 – 1904	Pasture land for farming and grazing animals	None
1904 – 1917	Part of a rifle range	Former firing stations and impact areas were not on school site
1917 – 1930	No record of use; possible pasture land	None
1932	AST 636 constructed	Tank was used to store fuel oil
1942	UST 772 constructed on adjacent parcel	Tank was used to store fuel oil. UST 772 was interconnected with AST 636 via a pipeline system
1943	Building 748 (pump station) constructed	None
1944	Attu Village constructed	Homoja huts for officers
1953	Elementary school (Building 864) constructed	None
1960	Attu Village deconstructed	None
1964	AST 636 rebuilt; use changed to transducer test facility	Tank was used to store water

Timeframe	Land Use of School Site	Comments
1976 – 1978	Unit G of elementary school (Building 864) constructed	None
1977 – 1978	AST 636 deconstructed	None
1989	Buildings 2000 and 2001 constructed	None
1989 – 1990	Units A, B, C, D, E, and F of Building 864 deconstructed	None
1995	Modular units constructed (Buildings 20, 21, 22, 23, 24, 25, 26, 27, 28, and 29) (Buildings 28A and 29A are double-wide storage trailers that were moved to the site on an unknown date)	None
1997	UST 772 deconstructed	None

A search of the database for the environmental baseline survey did not identify any hazardous wastes or hazardous materials that were stored at the school site (Supervisor of Shipbuilding, Conversion, and Repair, Portsmouth, Virginia, Environmental Detachment, Vallejo 1994). In addition, no spills of hazardous materials were reported to have occurred at the school site. Based on the site history, potential chemicals present in soil and groundwater at the school site include metals, lead from lead-based paint, PCBs, pesticides, and TPH.

3.4 POTENTIAL EXPOSURE PATHWAYS

Potential exposure pathways for soil, groundwater, air, and surface water were evaluated at the school site. Exposure routes identified included ingestion, inhalation, and dermal contact. The following sections discuss each exposure pathway by medium.

3.4.1 Soil

Most of the school site lacks a significant exposure pathway for soil because the school buildings and asphalt create a barrier to the soil beneath. Thus, the possibility for a complete soil exposure pathway is limited to the grassy and bare areas at the site (see Figure 2). For this reason, the November 2002 sampling event focused on further characterizing those areas. (Section 4.2 discusses the results of the November 2002 sampling event.) Because the potential exists for exposure through incidental ingestion of soil or dermal contact, comparison criteria for human health were used to evaluate the analytical results for the soil samples collected.

3.4.2 Groundwater

As discussed in Section 3.2.2, groundwater at the school site is not considered potable and does not discharge to any surface water body at the school site. Even though the potential for a complete exposure pathway to groundwater exists, there is no complete exposure route to individuals by ingestion or dermal contact with groundwater.

3.4.3 Air

Individuals may be exposed to chemicals in air by inhaling chemicals in vapor phase or sorbed to particulates. Chemicals can be transferred to the air by three mechanisms: (1) wind erosion of particulates from soil, (2) volatilization from soil, and (3) volatilization from groundwater. Soil particulates are not likely to be transferred to the air throughout most of the school site because grass, asphalt, or buildings occupy most of the land cover at the site. The limited bare areas are subject to wind erosion, resulting in a possible exposure pathway through the inhalation of airborne particulates. Soil and groundwater were analyzed for VOCs to assess any complete exposure pathways. (Section 4.2 discusses the results of the November 2002 sampling event.)

3.4.4 Surface Water

As discussed in Section 3.2.5, no surface water bodies exist at the site; therefore, surface water was not identified as a complete exposure pathway.

3.5 SUMMARY OF PREVIOUS INVESTIGATIONS

The following sections describe previous soil and groundwater investigations that were conducted at the school site.

3.5.1 Phase I: Mare Island Elementary School and WAVES Barracks Toxic Soil Testing and Analysis Report (Chlordane)

Chlordane is an insecticide, also referred to as a termiticide, which was commonly applied around building foundations to control termite infestations. In 1983, Cohrssen Associates and Brown and Caldwell conducted an environmental assessment at the school site, which identified the presence of chlordane in soil (Geo/Resource Consulting 1987). Soil samples were collected from 0 to 0.5 feet bgs along Units A through F of Building 864 (classrooms 7 through 12), which were subsequently deconstructed in the late 1980s. Those soil samples contained concentrations of chlordane greater than the total threshold limit concentration (TTLC) of 2.5 milligrams per kilogram (mg/kg).

In 1986, the Navy conducted additional sampling for chlordane around the perimeter of the demolished units of Building 864, and also at the nearby Women Accepted for Volunteer Emergency Service (WAVES) Barracks (Buildings 765 and 735, the latter not being within the current school boundary). Thirty-two samples were collected from soils near Building 864, at depth intervals of 0 to 0.5, 1 to 1.5, 2 to 2.5, and 3 to 3.5 feet bgs. Fifteen soil samples were collected at the WAVES Barracks at an interval of 0 to 0.5 feet bgs. Chlordane-contaminated soils were found around the former units of Building 864. The distribution of chlordane at hazardous concentrations greater than the soluble threshold limit concentration of 0.25 mg/kg ranged from the surface to 2.5 feet bgs and was limited to within 5 feet of the perimeter footing of the school building along known areas where chlordane was applied to control termites

(Geo/Resource Consulting 1987). The report concluded that chlordane contamination had not measurably migrated laterally or vertically from the areas where the termiticide was applied.

3.5.2 Mare Island Naval Shipyard: Buildings 735 and 765 Preliminary Endangerment Assessment

Radian Corporation conducted a preliminary endangerment assessment (PEA) in 1992 following the California Department of Health Services Guidance (1990) to assess the extent of residual chlordane contamination in soils at Buildings 735 and 765 and to perform a screening-level assessment of the potential threat to human health (Radian Corporation 1992). Sixty-two soil samples were collected from the site of the former buildings at depths ranging from 0.5 to 2.5 feet bgs and were analyzed for chlordane. The PEA concluded that residual concentrations of chlordane around the former Buildings 735 and 765 posed a significant threat to public health. The PEA further recommended that a human health risk assessment (HHRA) be conducted to evaluate if current conditions at the former building sites posed an actual threat to human health (Radian Corporation 1992).

3.5.3 Focused Human Health Risk Assessment for Buildings 735 and 765

In 1995, the Navy conducted a focused HHRA to reassess the potential risks to human health associated with chlordane contamination at Buildings 735 and 765 (PRC 1995a), which were presented in the PEA for Buildings 735 and 765 (Radian Corporation 1992). In reassessing potential risks to human health at the site, chlordane, heptachlor, and heptachlor epoxide were identified as chemicals of potential concern for the investigation. The HHRA was based on comparisons of the analytical data from the PEA report (Radian Corporation 1992) with EPA Region IX residential PRGs (EPA 1995). For Building 765, only chlordane had a maximum concentration greater than the PRG. The cancer risk associated with the soil sample with the maximum chlordane concentration was 3.5×10^{-5}, which is within the risk management range of between 1×10^{-6} (1 in a million) and 1×10^{-4} (1 in 10,000) provided by (EPA 1991).

The HHRA concluded that chlordane concentrations detected at Buildings 735 and 765 were on the low range of residual concentrations presented in other chlordane studies. The HHRA concluded that risks estimated at the site were likely to be similar to risks associated with residual chlordane concentrations in other areas where chlordane was applied using similar application procedures during the same time period (PRC 1995a).

3.5.4 Preliminary Assessment/Site Inspection Final Summary Report for Nonradiological Sites

In 1995, the Navy conducted a preliminary assessment/site inspection at the school site as part of the basewide evaluation of nonradiological sites (PRC 1995c). Based on results of the 1995 HHRA (PRC 1995a), it was determined that concentrations of residual chlordanes in soil were considered low and probably typical of concentrations in soil surrounding other similar structures at Mare Island. The Navy concluded from this evidence that no further investigation or action was warranted for the school site (PRC 1995c).

3.5.5 Draft Final Remedial Investigation Report, Operable Unit 2

A portion of the school site was investigated as part of Installation Restoration (IR) Site 23 during the phase II remedial investigation (RI) (PRC 1997a). The scope of the phase II work within the school property included vacuum excavations, geoprobe sampling, surface soil sampling, and groundwater sampling, as discussed below.

- Vacuum excavations were used to investigate the soil surrounding utilities that may have served as preferential pathways for contaminant transport. In June and October 1992, 13 soil samples were collected from 7 vacuum excavations on the school property. Six of the excavations were advanced along the two existing fuel pipelines, and one excavation was along an abandoned storm water pipeline adjacent to a fuel oil pipeline.

- In July and August 1993, a geoprobe survey was conducted to assess site stratigraphy and to collect soil and groundwater samples to evaluate the extent of contamination. Forty-two geoprobe borings were collected and advanced to depths between 5 and 16 feet bgs.

- In January 1995, surface soil samples were collected to characterize exposed surface soils for risk assessment purposes. One surface soil sample was collected at the former location of AST 636.

Results of the soil analysis during the phase II RI indicated that petroleum hydrocarbons were present in soils at the area near former AST 636; TPH as diesel range (TPH-dr) was apparently restricted to the upper 5 feet of soil at locations within 100 feet of the estimated tank location (PRC 1997a). Based on the fate and transport evaluation for IR23, it was concluded that the TPH constituents detected at the site would likely be affected by dispersion and degradation and were expected to attenuate naturally over time (PRC 1997a). Table A-1 presents a statistical summary of results for soil samples collected from the school site as part of the Phase II RI for IR23. Table F-1 in Appendix F of the SAP for the school site presents the complete analytical results for soil samples collected at the school site during previous investigations, and includes the soil samples collected from the school site during the Phase II RI for IR23 (Tetra Tech 2002c).

In August 1994, two groundwater monitoring wells, 23W08 and 23W09, were installed adjacent to and downgradient of the former location of AST 636 as part of the phase II RI (PRC 1997a). AST 636 was within the school property boundary (see Figure 2). The two wells were sampled quarterly as part of the facilitywide groundwater monitoring program (see Section 3.5.6). Table A-2 presents a statistical summary of the groundwater sampling results collected from monitoring wells 23W08 and 23W09 for the phase II RI and the facilitywide quarterly monitoring programs. Table F-2 in Appendix F of the SAP for the school site presents the complete analytical results for groundwater samples collected at the school site during previous investigations, and includes the groundwater samples from these two monitoring wells (Tetra Tech 2002c).

3.5.6 Interim Facilitywide Groundwater Monitoring Program Quarterly Report

Quarterly sampling of wells 23W08 and 23W09 took place during February 1995, November 1997, February 1998, June 1998, August 1998, and July 1999. Results of the quarterly groundwater sampling indicated that TPH contamination associated with tank releases was not present at concentrations exceeding groundwater screening criteria (Tetra Tech 1998b, 1998c, 1998d, 1999, 2000). Table A-2 presents the groundwater sampling results from the Phase II RI and the facilitywide quarterly monitoring programs.

3.5.7 Basewide Polychlorinated Biphenyl Confirmation Sampling Summary Report

Three active pole-mounted electrical transformers are present near the equipment storage shed at the school site (Tetra Tech 1998a). Samples collected from the transformers indicated that transformer oil contained PCBs at concentrations less than 5 parts per million. These transformers are not included in the Navy's PCB program, which involves active electrical transformers that contain PCBs at more than 50 parts per million, in accordance with requirements of the Toxic Substances Control Act.

In July 1997, two soil samples and two asphalt samples were collected below each of the transformers at the school site (Tetra Tech 1998a). PCBs were not detected in any of the samples. Table F-1 in Appendix F of the SAP for the school site presents the complete analytical results for soil samples collected at the school site during previous investigations, and includes the samples collected for the basewide PCB confirmation investigation (Tetra Tech 2002c). PCBs do not pose an unacceptable risk to human health or the environment and no further action was recommended in the summary report (Tetra Tech 1998a).

3.5.8 Vallejo Unified School District Report on Limited Soil and Water Sampling at the Mare Island Elementary School

In 1999, Kleinfelder Associates conducted limited soil and tap water sampling at the school site for the VUSD (Kleinfelder Associates 1999). Six soil samples were collected from around the existing school building at 0.5 foot bgs, and analyzed for metals, VOCs, SVOCs, pesticides, TPH, benzene, toluene, ethylbenzene, xylene, and gross alpha/gross beta radioactivity. In addition, two water samples were collected; one water sample was analyzed for gross alpha/gross beta radioactivity, and one was analyzed for total lead and total coliform bacteria. Results of the soil sampling revealed that 4,4'-dichlorodiphenyldichloroethene (DDE), 4,4'-dichlorodiphenyltrichloroethane (DDT), beta-chlordane, alpha-chlordane, and beta-benzene hexachloride (BHC) were detected in three soil samples. Concentrations of 4,4'-DDE and 4,4'-DDT were below the TTLC of 1,000 micrograms per kilogram, and the concentrations of beta-chlordane, alpha-chlordane, and beta-BHC were all below their respective laboratory reporting limits. Chromium, nickel, lead, and zinc were detected in the soil samples, but were also below their respective TTLCs. Results of the radioactivity analysis indicated detectable levels of low-level gross alpha and gross beta radioactivity in soil and tap water samples. Results of the total coliform bacterial analysis in tap water exceeded the accepted regulatory

limit; however, these results were not consistent with the weekly tap water data collected by the Mare Island Caretakers office. Based on these results, Kleinfelder Associates recommended that no further investigation was necessary at the school site, and that any future tap water sampling results be obtained through the Caretakers Office (Kleinfelder Associates 1999).

3.5.9 Final Closure Report, Underground Fuel Oil Piping and TPH-Contaminated Soil Removal

In summer 2001, during a break in the school schedule, the Navy conducted a removal action at the school site to remove soil contaminated with low concentrations of petroleum fuels and a segment of an abandoned fuel line pipe (Foster Wheeler 2002). A portion of the school site, along with the adjacent land, was used for storing and transferring fuel oil. Former AST 636 (removed in 1978) was located in the current school's playground (see Figure 2). In addition, UST 772 was located just north of the school fence line but was removed in 1997 (see Figure 2). A combination of diesel and heavy oil was stored in the tanks.

With the successful completion of the removal action in summer 2001, all remaining fuel lines were removed from the school site. Confirmation soil samples were collected and analyzed during the removal to determine the residual fuel concentrations present in soil. If concentrations in soil exceeded the target cleanup concentration, additional soil was removed. This process of excavating soil, analyzing confirmation samples, and removing additional soil is referred to as "over excavating." Because of the school schedule, two of the areas being over excavated were refilled before the final results of the soil analysis were available. At these locations, the concentrations of fuel left in soil at some locations (3 feet and 6 feet bgs) exceeded the comparison criterion of 400 mg/kg. Specifically, in Excavation Area 2, TPH as motor oil range (TPH-mr) was detected in one sidewall sample at 3 feet bgs at a concentration of 670 mg/kg and in the floor sample at 6 feet bgs at a concentration of 600 mg/kg. TPH-dr was also detected in the floor (6 feet bgs) at a concentration of 510 mg/kg. In Excavation Area 3, TPH-mr was detected in a sidewall sample at 3 feet bgs at a concentration of 1,500 mg/kg. However, because this low-level contamination was not widespread, was nonvolatile, and was immobilized under asphalt, no further removal of soil was deemed necessary (Foster Wheeler 2002). Table A-3 presents the confirmation sampling results.

DTSC submitted a letter of concurrence with the conclusions of the final summary report on November 14, 2002, agreeing that the removal action had met the intended objectives (DTSC 2002e).

3.5.10 Human Health Risk Assessment on Greensand at Mare Island Elementary School, Addendum to the Final Technical Memorandum

During excavation of the underground fuel pipeline and TPH-contaminated soil in summer 2001, it was discovered that the Navy had used greensand, a sandblast abrasive material, to backfill the areas around some of the pipes after repairs (Foster Wheeler 2001). Greensand was used for sandblasting ship and submarine parts to remove old or corroding paint. Several different abrasive blast materials were used at Mare Island between the 1950s and 1980s. Monterey sand

was used from the early 1950s to the late 1960s. At that time, occupational health issues were raised concerning the potential for workers to contract silicosis from materials with high silicon content. As a result, Monterey sand was then replaced by a nickel slag material, commercially known as Green Diamond® (also known as greensand). Green Diamond® was the only abrasive blast material used at Mare Island throughout the 1970s and well into the 1980s, when the shipyard switched to Kleen Blast®, a copper slag material (Naval Facilities Engineering Command, Engineering Field Activities West 1998). Greensand contains some of the original chemicals of the sandblast material, primarily nickel, along with any chemicals present in paint chips (for example, lead). Although most spent and unused greensand at Mare Island was disposed of in the landfill, some was used along utility lines after repairs because it was suitable as construction backfill.

The greensand found during the summer 2001 removal action was mixed with soil and located in isolated "pockets." The greensand pockets made up between 5 and 15 percent of the material excavated from the site. The Navy removed and disposed of most greensand encountered during the excavation; however, some greensand was left at depth in the sidewalls to allow backfill and restoration of the excavations in support of the school's schedule (Foster Wheeler 2001).

During the time of the excavations and today, grassy sod or asphalt covers the playground area where the excavations with greensand were located. Because there was no complete exposure pathway for children or adults at the school, the Navy concluded there was no risk to human health based on internal calculations. In March 2002, the Navy conducted an HHRA to ensure an unacceptable risk to children or adults would not occur in the future if any greensand were brought to the surface and presented the results to the regulatory agencies (Tetra Tech 2002a). The HHRA evaluated exposure of a child and an adult to concentrations of chemicals present in greensand that had previously been removed from the site. The HHRA considered exposure of greensand through ingestion, dermal contact, and inhalation. Results of the HHRA did not identify an unacceptable risk to children or adults (Tetra Tech 2002a). Because this HHRA focused on the removed soil and greensand and not the soils present at the school site, the regulatory agencies requested additional samples be collected at the school site to evaluate the risk to human health from remaining soil.

3.5.11 Preliminary Endangerment Assessment, Existing Mare Island Elementary School, 400 9th Street

In June and July 2003, Kleinfelder Associates performed sampling for the VUSD in support of a PEA for the school site. The purpose of the PEA was to confirm the presence of residual concentrations of potentially hazardous substances and whether they pose a threat to human health or the environment. Kleinfelder Associates evaluated surface and subsurface soil for metals, VOCs, SVOCs, PAHs, pesticides, PCBs, and TPH. Elevated concentrations of PAHs were detected, and it is assumed that these constituents originated from contaminated imported fill material. Results of the sampling indicated that the sum of the cancer risks estimated for soil ingestion, dermal contact, and inhalation is 1×10^{-4}, which exceeded the target cancer risk level of 1×10^{-6} (EPA 1991). This exceedance was likely due to the use of chlordane as a pesticide around building foundations. Results of the sampling also indicated elevated concentrations of

TPH due to residual contamination following prior remediation activities (Kleinfelder Associates 2003).

3.5.12 CH2M HILL Confirmation Sampling

In January 2003, CH2M Hill performed a geotechnical investigation for the future construction of a residential parkway. In that investigation, it was discovered that TPH might have contaminated the soil adjacent to the school site. Subsequent investigations were performed in February, March, and May 2003 by LMI to assess the extent of TPH contamination. TPH concentrations exceeded comparison criteria at four locations between Tisdale Avenue and the elementary school playground, within the school property line but outside of the playground fence. CH2M Hill drafted a remedial action work plan to remove TPH-contaminated soil from the area (CH2M Hill 2003). In August and September 2003, the contaminated soil was removed, and confirmation soil samples were collected from the excavation sidewalls and floor. Hot spots were over-excavated, and additional confirmation samples were collected. Two soil sample locations that could not be over-excavated within the school site portion of the 9th Street and Tisdale Avenue site exceeded the comparison criterion for TPH and were left in place. The residual TPH was identified between 6 and 10 feet below ground surface (now 15 feet below current ground surface), and the 9th Street and Tisdale Avenue site received regulatory closure.

3.5.13 Summary of Regulatory and Restoration Advisory Board Meetings

In conjunction with the investigations at the school site, meetings between the Navy, DTSC, Water Board, and EPA were held for the purposes of coordinating efforts and soliciting comments on the school site. Correspondence received and meetings and conference calls held included:

- Regulatory agency comments on the "Draft Closure Report for Underground Fuel Oil Piping and TPH Contaminated Soil Removal, Mare Island Elementary School at the Former Mare Island Naval Shipyard, Vallejo, California" (DTSC 2002a; EPA 2002a; Water Board 2002).
- Presentation of "Human Health Risk Assessment at the Mare Island Elementary School" at the RAB Meeting on April 25, 2002.
- Meeting on May 15, 2002, to discuss the removal of TPH-contaminated soil and HHRA on greensand for the school site.
- Regulatory agency comments on the "Draft HHRA on Greensand at Mare Island Elementary School" (DTSC 2002b).
- Presentation of school site summary at an agency meeting on July 3, 2002.
- Regulatory agency comments on the HHRA on greensand at the school site (DTSC 2002c; EPA 2002b).

- Conference call on September 26, 2002, between the Navy, EPA, DTSC, and Tetra Tech to discuss the school site history.

- Conference call on October 10, 2002, between the Navy, EPA, DTSC, VUSD, and Tetra Tech to discuss proposed sampling locations, depths, analyses, and protocols.

- Concurrence letter for the "Final Closure Report, Underground Fuel Oil Piping and TPH Contaminated Soil Removal, Mare Island Elementary School at the Former Mare Island Naval Shipyard, Vallejo, California" (DTSC 2002e).

- Comments on the "Draft Sampling and Analysis Plan, Soil and Groundwater Sampling at Mare Island Elementary School" (EPA 2002c).

- Conference call on November 21, 2002, between the Navy, EPA, DTSC, VUSD, and Tetra Tech to discuss the proposed sampling locations for the November 2002 sampling event.

- Presentation of "Environmental Activities at the Mare Island Elementary School" at the RAB Meeting on November 21, 2002.

- Draft data summary of the August 2003 sampling event at the school site (Tetra Tech 2003c).

4.0 NOVEMBER 2002 SAMPLING EVENT

The following sections describe the sampling methods and results for the November 2002 sampling event.

4.1 NOVEMBER 2002 SAMPLING METHODS

A SAP was prepared, with input from the regulatory agencies, prior to conducting the November 2002 sampling event (Tetra Tech 2002c; EPA 2002c). The following sections present the investigation approach, rationale for selecting analytical parameters, sampling methods and equipment used, field variances to the SAP, and site restoration activities.

4.1.1 Investigation Approach

Samples collected from the school site provided the information needed to determine (1) the extent of greensand below the playground and (2) if chemicals are present in soil and groundwater at concentrations that may pose an unacceptable risk to human health.

The school site was divided into six areas for soil sampling (see Figure 2):

- Area I (Grass and Bare Ground) – grassy playground area and bare ground areas near the grassy playground area
- Area II (Swing Set) – swing set in the paved playground area
- Area III – bare ground around Building 864
- Area IV – grassy area between Buildings 864 and 2000
- Area V – bare ground around Building 2001
- Area VI – sandbox

In addition, one groundwater sample was collected from each of the two existing monitoring wells at the site.

4.1.2 Rationale for Selecting Analytical Parameters

Samples that were collected to delineate the extent of greensand were analyzed visually; therefore, no selection of analytical parameters was required for these samples. Figure 2 shows the sampling locations.

A broad coverage of analytical procedures was selected to determine if chemicals are present at unacceptable concentrations in soil and groundwater at the school site. The specific analytical parameters selected were based on the available historical information regarding hazardous materials potentially occurring at the school site. Table 3 presents sampling locations, sample identification numbers, sample matrices, depths of soil samples, analyses, and the rationale for sampling locations. Figure 2 shows the sampling locations. All soil and groundwater samples collected for chemical analysis were submitted to California state-certified laboratories approved by the Navy.

The full suite of analyses specified for IDW was selected to be consistent with waste characterization required by disposal facilities.

4.1.3 Sampling Methods and Equipment Used

As presented in the SAP for the school site (Tetra Tech 2002c), the grassy playground was divided into a grid composed of 20-foot cells, and one soil boring was advanced at the center of each cell from 0 to 2 feet bgs using either a hand-held power drill with a 2.5-inch hollow stem auger, or a hand auger, following general practices listed in Tetra Tech standard operating procedure (SOP) 005 (provided in Appendix B to the SAP [Tetra Tech 2002c]). If a sprinkler head was located in a grid cell, then an additional soil boring was conducted adjacent to the

sprinkler head and visually inspected for greensand. No greensand was observed, but if it had been encountered, step-out borings would have been conducted at 5-foot intervals and up to 10 samples would have been collected. A written log was kept, and a photograph was taken of visually inspected soil from each boring. The photographs are presented in Appendix D.

In addition to the borings that were advanced to collect samples for visual inspections, the following 27 soil borings were advanced to 2 feet bgs throughout the school site:

- Four borings were located in the grassy playground area (Area I Grass)
- Four borings were located in bare ground areas adjacent to the grassy playground area (Area I Bare Ground)
- Four borings were located in the paved playground area around the swing set (Area II)
- Four borings were located in the bare ground around Building 864 (Area III)
- Four borings were located in the grassy area between Buildings 864 and 2000 and one boring was located in the grassy area to the northeast of Building 2000 (Area IV)
- Five borings were located in the bare ground around Building 2001 (Area V)
- One boring was located in the sandbox (Area VI)

Of these borings, 27 soil samples were collected at the surface (0 to 0.5 foot bgs) and 27 soil samples were collected from the shallow subsurface (1.5 to 2 feet bgs). All soil samples from the 27 borings were visually inspected for greensand prior to sample collection.

In addition, groundwater samples were collected from two existing monitoring wells using the slow purge method, following general practices listed in Tetra Tech SOP 015 (provided in Appendix B to the SAP [Tetra Tech 2002c]).

Because of limited access at several of the proposed soil boring locations, and the desire to avoid damaging grass sod, all of the soil borings, except the four borings in the paved playground area near the swing set (Area II), were completed using a jack hammer-sized, hand-held Geoprobe® rig or a hand auger, following general practices listed in Tetra Tech SOP 005 (provided in Appendix B to the SAP [Tetra Tech 2002c]). Because the surface in paved playground area near the swing set (Area II) was exposed, the four borings were installed using a faster, truck-mounted Geoprobe® rig. All Geoprobe® operations followed general practices listed in Tetra Tech SOP 054 (provided in Appendix B to the SAP [Tetra Tech 2002c]).

Soil sampling equipment consisted of a 4-foot-long stainless-steel sampler, lined with acetate, which was advanced to 2 feet bgs. The acetate sleeves were removed from the sampler, and

samples were cut from the sleeve in 6-inch sections and sealed with Teflon sheets and plastic caps.

4.1.4 Field Variances to the Sampling and Analysis Plan

In response to requests from the regulatory agencies, the Navy visually inspected selected soil borings for greensand to a depth of 5 feet bgs prior to collection of samples for laboratory analysis. Three soil borings were advanced to 5 feet bgs: one boring was located in the paved playground area near the swing set (Area II) and two borings were located in the grassy area between Buildings 864 and 2000 (Area IV).

4.1.5 Site Restoration

The site was restored to presampling condition at the conclusion of the field effort. Because only hand-held equipment was used for sampling, damage to the site was minimal. Therefore, soil borings were filled with clean potting soil.

4.2 RESULTS FROM THE NOVEMBER 2002 SAMPLING EVENT

The following sections present the results of the visual inspection for greensand and analytical results of the soil and groundwater samples, as well as a discussion of IDW. The weather during the sampling event consisted primarily of overcast, cool mornings, warming slightly in the afternoon. Precipitation was not recorded during the sampling event.

4.2.1 Soil Sampling Results

The following sections present the results of the visual inspection of soil borings for greensand and the analytical results for soil samples collected at the school site in November 2002.

4.2.1.1 Visual Inspection of Soil Samples for the Presence of Greensand

Ninety soil borings were collected between 0 and 2 feet bgs from the grassy playground area in Area I and visually inspected for greensand. The soil samples were photographed and catalogued. Appendix D presents photographs of the sampling grid and a photograph of each soil sample. In addition, three soil borings were advanced to 5 feet bgs and visually inspected for greensand: one boring was located in the paved playground area near the swing set (Area II) and two borings were located in the grassy area between Buildings 864 and 2000 (Area IV). Greensand was not observed in any of these soil samples; therefore, no step-out samples were collected.

4.2.1.2 Analytical Results for Soil Samples

Analytical results for soil samples identified two locations with metals concentrations exceeding comparison criteria and two locations with TPH concentrations exceeding comparison criteria. Concentrations of hexavalent chromium, VOCs, SVOCs, pesticides, and PCBs were not detected in any soil samples above comparison criteria. Figure 3 shows the locations where chemical concentrations exceeded comparison criteria. Table 4 presents a statistical summary of the sampling results, and Appendix B presents the full analytical results. The following table summarizes the results for each location and the concentrations of chemicals that were detected in the soil samples above comparison criteria.

Compound	Location	Sample Depth (feet bgs)	Concentration (mg/kg)	Comparison Criteria (mg/kg)
Inorganic Compounds				
Iron	ELEMGB015	1.5	45,800	44,000[a]
Lead	ELEMGB003	1.5	620	210[b]
Vanadium	ELEMGB015	1.5	141	130[a]
Petroleum Indicators				
TPH-dr	ELEMGB007	0	470	400[c]
	ELEMGB009	0	960	400[c]
TPH-mr	ELEMGB009	0	810	400[c]

Notes:

a Comparison criteria for iron and vanadium are the Mare Island ambient native soil concentrations (Tetra Tech 2002b).

b Comparison criterion for lead is the Mare Island site-specific lead PRG calculated using the "LeadSpread Risk Assessment Spreadsheet, Version 7 for estimating blood-lead concentrations" (Tetra Tech 2001; DTSC 1999).

c Source: PRC. 1997b. "Draft Final Group II and III Accelerated Study Field Sampling and Analysis Plan. Mare Island." August 5.

The maximum concentration of iron exceeded the Mare Island ambient concentration for native soils, but the concentration is below the Mare Island ambient fill concentration of 62,000 mg/kg. The maximum concentration of vanadium exceeded the Mare Island ambient concentration for native soils, but the concentration is below the Mare Island ambient fill concentration of 190 mg/kg. The school site is within the original boundary of Mare Island; therefore, the ambient native soil concentrations initially were expected to be the most appropriate criteria to use for comparison; however, results of previous investigations and site observations indicated that surface materials at the site are more characteristic of construction fill material than native soils. The sample with the elevated iron and vanadium concentrations was collected directly adjacent to Building 2001; therefore, a more appropriate comparison criterion for iron and vanadium would likely be concentrations that are between the concentrations that represent native soil and ambient fill. Because none of the other 53 sample results for iron or vanadium exceeded comparison criteria, and the average concentrations for the site (22,700 mg/kg and 46.5 mg/kg, respectively) are below PRGs, iron and vanadium are not likely to pose unacceptable risks to human health.

The maximum concentration for lead exceeded the Mare Island site-specific residential PRG for lead (Tetra Tech 2001). The sample with the elevated lead concentration was collected from the grassy playground area at 1.5 feet bgs. Because none of the other 53 sample results for lead exceeded comparison criteria and the average concentration for the site (31.1 mg/kg) was below the PRG, lead is not likely to pose unacceptable risks to human health (see Table 4).

TPH-dr exceeded the comparison criterion in two surface soil samples. TPH-dr was detected at a concentration of 470 mg/kg at location ELEMGB007, collected at 0 feet bgs from the bare ground near the grassy playground area (Area I Bare Ground) and also at a concentration of 960 mg/kg at location ELEMGB009, which was collected at 0 feet bgs from the swing set area (Area II). All of the other samples from the school site were below the TPH-dr comparison criteria of 400 mg/kg.

TPH-mr was detected at a concentration of 810 mg/kg in one soil sample from location ELEMGB009 in the swing set area (Area II), which is also above the comparison criteria of 400 mg/kg. All of the remaining samples that were collected at the school site were below the comparison criteria for TPH-mr (see Table 4).

If a person were to be exposed to TPH concentrations at the school site, a reasonable exposure would likely be the average concentrations at the site. The environmental screening level (ESL) developed by Water Board for residential areas where groundwater is not a drinking water source is 100 mg/kg for TPH as gasoline range and 500 mg/kg for other TPH fractions (Water Board 2005). The ESL for noncarcinogens such as TPH represents a human health hazard quotient of 0.2 (adjusted down from 1.0) to allow for cumulative effects for up to five chemicals contributing to the hazard index. If the ESLs were adjusted to correspond with a hazard quotient of 1.0, the corresponding ESLs would be five times greater. These adjusted ESLs would be appropriate comparison criteria for the school site because this site was analyzed for the full suite of potential contaminants that could be contributing to any risk and average concentrations were below ambient or risk-based comparison criteria. The maximum and average TPH concentrations at the school site are significantly less than the adjusted ESLs; therefore, TPH concentrations at the site are not likely to pose unacceptable risk to human health.

4.2.2 Groundwater Sampling Results

Table 5 summarizes the groundwater sampling results, and Appendix B presents the full analytical results. Analytical results for the two groundwater samples were evaluated using comparison criteria that consisted of the higher of the ambient water quality criteria or the Mare Island ambient groundwater concentration (Table 2). Analytical results for groundwater samples identified one location (23W08) where heptachlor epoxide was detected at a concentration of 0.04 microgram per liter (µg/L), which is above the comparison criteria of 0.0036 µg/L (see Figure 3). Heptachlor epoxide is a breakdown product of chlordane, which was a common insecticide used at Mare Island. Concentrations of metals, hexavalent chromium, VOCs, SVOCs, pesticides, PCBs, and TPH were not detected in any groundwater samples at concentrations exceeding comparison criteria. Although heptachlor epoxide exceeded the comparison criteria in one well, concentrations in the other nearby monitoring well were not

detected during the November 2002 sampling event. In addition, heptachlor epoxide concentrations from previous rounds of groundwater sampling only intermittently exceeded the comparison criterion (see Table A-2). The exposure pathway for human ingestion of groundwater is not complete; therefore, concentrations of heptachlor epoxide do not pose unacceptable risk.

4.2.3 Investigation-Derived Waste

Tetra Tech followed the procedures for decontamination of sampling equipment listed in SOP 002 (provided in Appendix B to the SAP [Tetra Tech 2002c]). Before beginning sampling activities, all sampling equipment was steam cleaned using a portable steam cleaner and on-site potable water. Equipment was also steam cleaned prior to the installation of each soil boring. All water derived from decontamination was collected and temporarily stored on site for characterization.

One drum of solid and liquid IDW combined was generated during the initial SI. IDW included excess soil extracted by direct-push samplers, and wastewater from decontamination procedures. One equipment rinsate sample was collected and analyzed for metals, VOCs, SVOCs, pesticides, PCBs, and TPH.

After sample results for the equipment rinsate sample were validated, the IDW was picked up by a licensed transporter and taken to a licensed disposal facility in Kettleman Hills, California. Appendix C presents the relevant documentation.

5.0 AUGUST 2003 SAMPLING EVENT AND THE 9TH STREET AND TISDALE AVENUE REMOVAL ACTION

The following sections describe the sampling methods and results for the August 2003 sampling event and a removal action conducted by CH2M Hill on an adjacent site known as the 9th Street and Tisdale Avenue site. The 9th Street and Tisdale Avenue site extended partially onto the school site. CH2M Hill conducted removal actions for the 9th Street and Tisdale Avenue site on both the adjacent LMI property as well as the portions of the site that extended onto the Navy school site property. Subsequent to completion of the removal actions LMI obtained regulatory closure of the portion of the 9th Street and Tisdale Avenue site that affected the LMI property.

5.1 AUGUST 2003 SAMPLING METHODS

An addendum to the previously submitted SAP was prepared with input from the regulatory agencies prior to conducting the elementary school sampling (Tetra Tech 2003b). The following sections present the investigation approach, rationale for selecting analytical parameters, sampling methods and equipment used, field variances to the SAP addendum, and site restoration activities.

5.1.1 Investigation Approach

In early 2003, CH2M Hill discovered subsurface TPH on the 9th Street and Tisdale Avenue site and performed four investigations to assess the extent of the contamination (CH2M Hill 2003). The source of the contamination was likely the result of tank leakage or drainage, or direct disposal of waste oil, or placement of soil contaminated by TPH on or near the school site. TPH may have been infrequently deposited along the historic shoreline, beyond the boundary of the school site property, and covered with fill material used for grading at this site.

CH2M Hill's investigations indicated that potential TPH contamination could exist at the school site. As a result, the Navy collected additional soil and groundwater samples on the western edge of the school site adjacent to the edge of the lateral extent of the contamination from the 9th Street and Tisdale Avenue site to assess whether TPH had migrated to the school site and, if it had migrated, how far it extends. Samples collected provided the information needed to determine the extent of TPH contamination in soil and groundwater at concentrations that may pose an unacceptable risk to human health.

The Navy selected 10 boring locations for soil and groundwater sampling (step-out samples) near four previous CH2M Hill sampling locations on the school site property associated with the 9th Street and Tisdale Avenue site, where concentrations of TPH equaled or exceeded 1,000 mg/kg (TISD9GB040, TISD9GB041, TISD9GB046, and TISD9GB048) (see Figure 4). As described in Section 5.1.4, only eight of these 10 borings were advanced. At each boring location, samples were collected from three depths from 0 to 25 feet bgs and analyzed for TPH. One sample from each boring location was analyzed for PAHs. One groundwater sample for TPH was also collected at each of the boring locations.

5.1.2 Rationale for Selecting Analytical Parameters

The analytical parameters selected were based on available information regarding TPH potentially occurring or migrating onto the school site. Table 6 presents sampling locations, sample identification numbers, sample matrices, depths of soil samples, analyses, and the rationale for sampling locations. All soil and groundwater samples collected for chemical analysis were submitted to California state-certified laboratories approved by the Navy.

The analytical parameters for IDW were selected to be consistent with waste characterization required by disposal facilities.

5.1.3 Sampling Methods and Equipment Used

The sampling methods were presented in the SAP addendum for the school site (Tetra Tech 2003b). Each sampling location was drilled using a using a dual percussion rig operated by ResonantSonic. The borings were advanced to 25 feet bgs. A written log was kept, and soil borings were described in a soil boring log field form (see Appendix E).

Twenty-four soil samples were collected between 0 and 25 feet bgs from eight boring locations. All soils were visually inspected for petroleum staining prior to sample collection. Sample depths were selected based on highest photoionization detector (PID) readings and/or other evidence of petroleum product (such as staining).

In addition, a temporary well screen was installed in each soil boring location to collect one grab groundwater sample at each location.

Soil sampling equipment consisted of a 40-foot-long stainless-steel sampler, lined with acetate, which was advanced to 25 feet bgs. The acetate sleeves were removed from the sampler, and soils were logged in a standard soil boring log field form (see Appendix E). Samples were collected from the sleeve and placed in glass jars covered with aluminum foil. After about 10 minutes, the probe on a PID was inserted into the jar through the aluminum foil to detect elevated concentrations of aromatic hydrocarbons. The sample with the highest PID reading of the three samples collected at each location was also analyzed for PAHs.

5.1.4 Field Variances to the Sampling and Analysis Plan Addendum

Two of the original 10 boring locations were not advanced because petroleum contamination was not present in samples collected from soil borings that were closer to the 9th Street and Tisdale Avenue site.

During sampling, regulatory agency representatives requested that all soil borings be drilled to a depth between 32 and 40 feet bgs. Two soil borings were drilled to 32 feet bgs, and one soil boring was drilled to 40 feet bgs. Refusal was encountered on the weathered bedrock in the remaining five soil borings, thus preventing drilling to 32 feet bgs.

5.1.5 Site Restoration

The site was restored to presampling condition at the conclusion of the field effort. Upon collection of the grab groundwater samples from the borings, the borings were grouted and completed to grade.

5.2 RESULTS FROM THE AUGUST 2003 SAMPLING EVENT

The following sections present the results of the visual inspection for petroleum staining and analytical results of soil and groundwater samples, as well as a discussion of IDW. The weather during sampling activities consisted primarily of overcast, cool mornings, warming slightly in the afternoon. Precipitation was not recorded during the sampling event.

5.2.1 Soil Sampling Results

The following sections present the results of the visual inspection of soil borings for petroleum staining and the analytical results for soil samples collected at the school site in August 2003.

5.2.1.1 Visual Inspection of Soil Samples for the Presence of Petroleum Staining

Twenty-four soil samples were collected between 0 and 25 feet bgs from the school site and visually inspected for petroleum staining. The soil borings were described in a soil boring log field form. Appendix E presents the boring logs for all soil borings. Some petroleum staining was observed within the veins of silt observed in two soil boring locations (ELEMGB030 and ELEMGB033) at about 18 to 20 feet bgs. Petroleum odor was observed in two soil boring locations (ELEMGB030 and ELEGB031).

5.2.1.2 Analytical Results for Soil Samples

Analytical results for soil samples identified one location with TPH concentrations exceeding comparison criteria. TPH-dr exceeded the comparison criterion of 400 mg/kg in one soil sample collected at ELEMGB030 at a depth of 19 to 20 feet bgs. All other soil sample results were below comparison criteria for TPH and PAHs. Figure 5 presents the locations, depths, and concentrations of TPH measured in soil at the school site in August 2003 by the Navy along with the results from the sampling performed by CH2M Hill in 2003 prior to soil removal. Table 7 presents a statistical summary of the sampling results. Appendix B presents the full analytical results exclusive of the CH2M Hill data for the 9th Street and Tisdale Avenue site. A discussion of the CH2MHill data for the 9th Street and Tisdale Avenue site that affected the school site property is included in Section 5.3.

Although TPH concentrations in one soil sample collected in August 2003 exceeded the TPH comparison criteria, average TPH concentrations at the site were below ambient and risk-based comparison criteria. In addition, the maximum and average TPH concentrations at the school site are significantly less than the adjusted ESLs developed by Water Board (2005); therefore, TPH concentrations at the site are not likely to pose unacceptable risk to human health.

5.2.2 Groundwater Sampling Results

Analytical results for the groundwater samples were evaluated using the Mare Island groundwater comparison criterion of 1.4 milligrams per liter (mg/L). During the August 2003 sampling event, TPH-mr exceeded the Mare Island groundwater comparison criterion in one sample collected from location ELEMGB033. Groundwater concentrations were also compared with ESLs developed by the Water Board (2005). Results indicated that TPH-mr exceeded the final ESL based on ceiling value and the ESL based on the drinking water toxicity value in seven out of eight and five out of eight samples, respectively. However, TPH-mr concentrations exceeded the final ESL for nondrinking water in only one sample from location ELEMGB033. Results also indicated that TPH-dr exceeded the final ESL based on ceiling value and the ESL

based on the drinking water toxicity value in one sample collected from location ELEMGB033. However, TPH-dr concentrations did not exceed the final ESL for nondrinking water. Figure 6 presents the locations of all monitoring wells and temporary monitoring points as well as analytical results for all samples that exceeded the comparison criterion for TPH-dr and TPH-mr used in this report. Table 8 summarizes the groundwater sampling results, and Appendix B presents the full analytical results exclusive of the CH2M Hill data from the 9th Street and Tisdale Avenue site. A discussion of the CH2M Hill data for the 9th Street and Tisdale Avenue site that affected the school site property is included in Section 5.3.

Although TPH exceeded the Mare Island groundwater comparison criterion in one sampling location, concentrations above the comparison criterion in the other nearby locations were not found during the August 2003 sampling event. The one sampling location with the maximum TPH-mr concentration exceeding the nondrinking water ESL does not appear to be representative of groundwater concentrations throughout the school site. The exposure pathway for human ingestion of groundwater is not complete and concentrations of TPH compared to ESLs based on drinking water criteria are not representative of potential site exposure. As a result, groundwater does not pose an unacceptable risk to human health at the school site.

5.2.3 Investigation-Derived Waste

Tetra Tech followed the procedures for decontamination of sampling equipment listed in SOP 002 (provided in Appendix B to the SAP [Tetra Tech 2002c]). Before beginning sampling activities, all sampling equipment was steam cleaned using a portable steam cleaner and on-site potable water. Equipment also was steam cleaned prior to the installation of each soil boring. All water derived from decontamination was collected and temporarily stored on site for characterization.

One drum of solid and liquid IDW combined was generated during the SI. IDW included excess soil extracted by direct-push samplers and wastewater from decontamination procedures. One soil sample was collected from the drum and analyzed for metals and VOCs.

After sample results for the soil sample were validated, the IDW was picked up by a licensed transporter and taken to a licensed disposal facility in Kettleman Hills, California. Appendix C presents the relevant documentation.

5.3 Remedial Action at the 9th Street and Tisdale Avenue Site

The sections below describe the remedial action performed at the 9th Street and Tisdale Avenue site by CH2M Hill and site closure with regulatory agencies.

5.3.1 Remedial Action Summary

As discussed in Section 3.5.12, during a geotechnical investigation performed by CH2M Hill in January 2003, it was discovered that TPH might have contaminated the soil adjacent to the

school site. Subsequent investigations were performed to assess the extent of TPH contamination, which is believed to have originated from tank leakage or drainage, or direct disposal of waste oil, or placement of soil contaminated by TPH on or near the school site. TPH concentrations exceeded the comparison criterion at locations across the 9th Street and Tisdale Avenue site and within the school property line. In July 2003, CH2M Hill prepared an interim remedial action work plan to remove TPH-contaminated soil from the area (CH2M Hill 2003). Completion of the interim remedial action work plan allowed excavation activities to proceed prior to submittal of the draft remedial action work plan in August 2003. The soil excavation activities as well as sampling and groundwater monitoring are described below.

5.3.1.1 Soil Excavation and Sampling

Soil excavation was completed between August 8 and September 12, 2003. In total, 47,486 cubic yards of soil were excavated. Of the 47,486 cubic yards of soil, 35,510 cubic yards of soil were contaminated with TPH. During excavation activities, TPH was observed only as thin distinct seams. In the final excavation sidewall on the eastern side of the excavation, visible petroleum hydrocarbon contamination was observed in a single seam of sandy material lying immediately on the contact between weathered siltstone bedrock and the overlying clay dredge spoil fill materials (see Figure 8). The sandy layer extended across approximately 3 yards of sidewall length varying in thickness from approximately 6 inches to a maximum of approximately 2 feet. No petroleum hydrocarbon free-product was observed flowing from the sidewall. This residual TPH left in the excavation sidewall was observed between 6 and 10 feet bgs (now 15 feet below current ground surface) (CH2M Hill 2003).

In total, 29,850 cubic yards of the TPH-contaminated soil originated from the LMI portion of the site and were disposed of off site by LMI. The remaining TPH-contaminated soil (5,660 cubic yards) originated from the school site and was disposed of off site by the Navy. The overburden soil not contaminated with TPH (11,976 cubic yards) was used as backfill material. The entire excavation area was backfilled with a minimum of 6 feet of clean soil (CH2M Hill 2004a). Figure 8 presents a topographic profile of the site based on pre-excavation conditions as well as the approximate current grade.

Confirmation soil samples were collected from the excavation sidewalls and floor. Several hot spots were identified based on results of confirmation sample analyses. The hot spot areas were over-excavated, and new confirmation samples were collected. All confirmation samples were analyzed for TPH-dr and TPH-mr, and 15 percent of the samples were also analyzed for PAHs. Five additional samples were analyzed for VOCs, including benzene, toluene, ethylbenzene, and xylene (BTEX) and methyl tertiary butyl ether (MTBE) (CH2M Hill 2004a). Figure 7 presents the locations of all confirmation samples collected (excluding those that were over-excavated) as well as the analytical results for the samples that exceeded the comparison criterion used in this report for both TPH-dr and TPH-mr (400 mg/kg [PRC 1997b]).

Two soil sample locations within the school site portion of the 9th Street and Tisdale Avenue site exceeded the comparison criterion used in this report for both TPH-dr and TPH-mr. BTEX and MTBE were not detected in any confirmation samples. PAHs that exceeded screening levels

were detected at depths greater than 10 feet bgs. CH2M Hill performed a risk assessment for the PAH chemicals of potential concern. The results indicated acceptable risk for unrestricted site reuse. Any chemicals remaining in soil at the site are covered with a minimum of 6 feet of clean soil; therefore, the potential for contact with any contaminated soil is unlikely (CH2M Hill 2004a).

5.3.1.2 Groundwater Monitoring

Eight monitoring wells and four temporary monitoring points were completed in October 2003. Samples were collected in November and December 2003 and January 2004. All samples collected from the monitoring wells were non-detect for TPH-dr and TPH-mr. TPH-dr was detected in six samples collected from the temporary monitoring points, and TPH-mr was detected in seven samples collected from the temporary monitoring points. Only one detection of TPH-dr exceeded the Tier 2 screening level for groundwater. The other detections of TPH-dr and TPH-mr did not exceed Tier 2 screening levels. CH2M Hill recommended site closure for groundwater based on the sample results (CH2M Hill 2004b). Figure 6 presents the locations of all monitoring wells and temporary monitoring points as well as the analytical results for the samples that exceeded the comparison criterion used in this report for both TPH-dr and TPH-mr (1.4 mg/L [PRC 1997b]).

5.3.2 Conceptual Site Model

Based upon historical maps and photos, and the conditions encountered during removal actions at the 9th Street and Tisdale Avenue site and the former Marine Corps Firing Range, the following conceptual site model is presented to bring together the lines of evidence relating to the potential for further migration of petroleum hydrocarbons from the Tisdale Avenue site onto the school site.

The TPH contamination occurring at the 9th Street and Tisdale Avenue Site was located just west of the former shoreline of Mare Island. It is believed that this resulted from either tank leakage or drainage, or direct disposal of waste oil, or placement of soil contaminated by TPH on or near the school site. Based on the discovery of waste materials and debris at this site and along the shoreline near the former Marine Corps Firing Range, there exists a pattern of disposal by the Navy along the former western shoreline. The historic shoreline is shown on Figure 6 and Figure 7.

In the vicinity of the school site, the location of former shoreline followed the outcrop of weathered bedrock which forms the higher ground at the southern end of Mare Island. The weathered bedrock was encountered both in borings advanced at the school site and in the removal action excavation at the 9th Street and Tisdale Avenue site. The visibly stained soil observed during the removal action occurred within distinct seams within the unconsolidated materials overlying the bedrock and in a lens of sandy material within a layer of debris and clay lying above the weathered bedrock interface in the final excavation wall. The nature of this occurrence suggests that the TPH was released into or onto recent debris, fill, or sediments

accumulating along the former shoreline, and that any migration is limited to permeable zones within the recent clay fill and debris.

The interface between recent sediments and weathered bedrock slopes down from the school site towards the former shoreline. Similarly, the Mare Island groundwater gradient is westwards from the school site to the former shoreline and eventually out to the current shoreline. Both of these factors provide a basis for assuming that any residual TPH contamination at the 9th Street and Tisdale Avenue site is limited in lateral extent to the immediate vicinity of the original shoreline which runs immediately west of the school fence line, and that any migration to groundwater would most likely be transported westwards away from the school property.

5.3.3 Site Closure

In February and March 2004, CH2M Hill submitted documentation to regulatory agencies that requested approval of no further action for the soil and groundwater for the LMI portion of the 9th Street and Tisdale Avenue site (CH2M Hill 2004a, 2004b). In April 2004, the Water Board issued a letter approving a no further action recommendation for the LMI portion of the 9th Street and Tisdale Avenue site. Their decision was based on the conclusions that potential sources of a release to groundwater were remediated through the soil removal and that groundwater impacts do not pose a threat to human health or ecological receptors (Water Board 2004).

In July 2004, DTSC issued a letter certifying the termination of the Resource Conservation and Recovery Act Corrective Action at Investigation Area D2 (which includes the 9th Street and Tisdale Avenue site). Their decision was based on a review of the completed remedial and corrective actions and the related public review process for the site (DTSC 2004).

6.0 CONCLUSIONS AND RECOMMENDATIONS

The following sections present the conclusions and recommendations for soil, groundwater, air, and surface water at the school site based on the results of the previous investigations and recent sampling activities.

6.1 SOIL

This section presents the results of sampling activities conducted to evaluate the concentrations of inorganic and organic chemicals in soil at the school site. Based on the site history and previous investigations, the primary sources of chemicals at the site were identified as metals from greensand, lead from lead-based paint, chlordane from pesticide applications, PCBs from transformers, and TPH from fuel storage activities (see Section 3.3 and Section 3.5).

6.1.1 Inorganic Chemicals in Soil

Although greensand was encountered during the TPH removal action in summer 2001, subsequent investigations in November 2002 did not identify greensand in any of the 90 soil borings that were advanced in the surface soils at the grassy playground area (see Section 4.2.1.1). Greensand encountered during the summer 2001 excavation was present at depth, and individuals at the site could be easily exposed to any residual concentrations left at the site. Results of the HHRA, which was conducted using analytical results from soil contaminated with greensand that had been removed from the site, did not identify unacceptable risk from exposure to concentrations of chemicals in soil samples (see Section 3.5.10).

During the November 2002 sampling event, one sample from the grassy playground area exceeded the comparison criteria for lead, and another sample near the buildings exceeded the comparison criterion for iron and vanadium. However, none of the other 53 sample results for lead, iron, or vanadium exceeded comparison criteria, and the average concentrations for the site are below their respective PRGs. These results confirm that concentrations of metals at the site do not pose unacceptable risk to human health (see Section 4.2.1.2).

Results of a VUSD investigation of lead concentrations in soil near buildings at the school did not identify concentrations present at the site that would pose unacceptable risk to human health (see Section 3.5.8) (Kleinfelder Associates 1999). Because only a limited number of samples were collected during the VUSD investigation, the Navy collected additional samples along the school building drip lines in November 2002. Results of the November 2002 sampling confirmed that concentrations of lead in soil along the buildings are not elevated and do not pose unacceptable risk to human health (see Section 4.2.1.2).

6.1.2 Organic Chemicals in Soil

Chlordane concentrations in soil samples from the school site did exceed human health criteria in previous investigations (see Section 3.5.3). The HHRA concluded that chlordane concentrations were on the low range of residual concentrations presented in other chlordane studies. The HHRA also concluded that risks estimated at the school site were likely to be similar to risks associated with residual chlordane concentrations in other areas where chlordane was applied using similar application procedures during the same general time period (PRC 1995a). The extent of the maximum chlordane concentrations was limited vertically and horizontally to within 5 feet of the area where the initial chlordane applications occurred. Results of the November 2002 sampling confirmed that concentrations of pesticides in soil were not elevated and do not pose unacceptable risk to human health (Section 4.2.1.2).

PCB concentrations in soil samples collected at the site do not pose unacceptable risk to human health. No PCB abatement was conducted at the site because concentrations in soil and asphalt were below 1 mg/kg, which is considered protective of human health in residential areas (Tetra Tech 1998a). Results of the November 2002 sampling confirmed that concentrations of PCBs in soil were not elevated and do not pose unacceptable risk to human health (see Section 4.2.1.2).

As discussed in Section 3.5.9, confirmation samples from the TPH removal action conducted in summer 2001 indicated that TPH-dr concentrations exceeded the comparison criterion in one surface sample, and TPH-mr exceeded the comparison criterion in three surface samples (see Table A-3). The conclusion of the final closure report stated that TPH contamination does not pose an unacceptable risk at the site because of the limited extent of contamination, the relatively low mobility of contaminants, the protective nature of asphalt covering most of the site, and the expected reduction of concentrations over time through natural attenuation mechanisms (Foster Wheeler 2002). DTSC concurred with the conclusions of the TPH removal action summary report in 2002 (DTSC 2002e).

Result of additional sampling in November 2002 identified two locations with TPH concentrations above comparison criterion (see Section 4.2.1.2). TPH-dr exceeded the comparison criterion in two surface samples (ELEMGB007 and ELEMGB009) located in the bare ground area near the grassy playground area and the bare ground near the swing set. All of the other samples from the school site were below the TPH-dr comparison criterion of 400 mg/kg. Location ELEMGB009 also had a TPH-mr concentration above the comparison criterion of 400 mg/kg.

Sampling conducted by CH2M Hill in early 2003 identified four locations within the school site property with TPH concentrations above comparison criterion. Step-out sampling performed in August 2003 by Tetra Tech for the Navy based on these four locations identified only one additional location with a TPH concentration above comparison criterion (ELEMGB030), confirming that the extent of TPH contamination on the school site was limited. TPH-dr exceeded the comparison criterion in one subsurface soil sample collected by the Navy along the fence bordering the 9th Street and Tisdale Avenue site. All other step-out soil sample results were below comparison criterion for TPH (see Figure 7). Soil removal activities were conducted by CH2M Hill for the 9th Street and Tisdale Avenue site in August and September 2003 and included the western portion of the school site property where the four elevated concentrations of TPH were originally found. Confirmation samples collected after the soil excavation revealed two locations within the school site property with TPH concentrations that exceeded comparison criterion. The topography and slope stability of the area around these locations did not allow for over-excavation of the soil in these hot spots; therefore, the soil was left in place. These sample locations are considered isolated detections because surrounding samples did not exhibit similar concentrations. In addition, the sample locations were covered with a minimum of 6 feet of clean soil. Figure 8 presents a geological cross-section and conceptual site model based on excavation conditions as well as the approximate current grade. The conceptual site model graphic and supporting information presented in Section 5.3.2 indicates that any TPH contamination present would not likely migrate onto the school site property from the 9th Street and Tisdale Avenue site. The approximate current grade shown indicates that three out of five locations on the school site property where TPH exceed comparison criterion are covered with a minimum of 6 feet of clean soil.

Figure 7 presents the locations of and analytical results for the samples that exceeded the comparison criterion for TPH-dr and TPH-mr and remain on site after soil removal activities were completed. Although TPH concentrations in five samples collected at the school site

exceeded the TPH comparison criterion, average TPH concentrations at the site were below ambient and risk-based comparison criteria, and the maximum and average TPH concentrations at the school site are significantly less than the adjusted ESLs developed by Water Board (2005). In addition, following the completion of the soil removal activities minimal further migration of the residual contamination onto the school site is anticipated based on the absence of free-product, the limited permeability of the soils, and the bedrock-dredge material interface that dips generally westwards away from school site towards the Tisdale Avenue site remediated by CH2M Hill. Therefore, TPH concentrations at the site are not likely to pose unacceptable risk to human health.

6.2 GROUNDWATER

This section presents the results of previous and recent sampling activities conducted to evaluate the concentrations of inorganic and organic chemicals in groundwater at the school site. Based on the site history and previous investigations, the primary sources of contaminants at the site were identified as metals from greensand, lead from lead-based paint, chlordane from pesticide applications, PCBs from transformers, and TPH from fuel storage activities (see Section 3.3 and Section 3.5).

6.2.1 Inorganic Chemicals in Groundwater

No inorganic chemicals exceeded comparison criteria in the groundwater samples collected from the school site in the previous investigations or in the November 2002 sampling activities (see Table 5 and Table A-2). In addition, because groundwater at the site is not potable, no exposure pathway exists.

6.2.2 Organic Chemicals in Groundwater

Concentrations of pesticides and PCBs did not exceed comparison criteria in any groundwater samples collected from the school site in previous investigations or in the November 2002 sampling activities (see Table A-2 and Table B-2).

Concentrations of heptachlor epoxide exceeded groundwater comparison criteria at the school site. One well sampled during November 2002 had heptachlor epoxide concentrations greater than comparison criteria; the sample from the other nearby monitoring well was below the detection limit. In addition, heptachlor epoxide concentrations from previous rounds of groundwater sampling only intermittently detected heptachlor epoxide above comparison criteria (see Table A-2). The exposure pathway for human ingestion of groundwater is not complete; therefore, concentrations of heptachlor epoxide do not pose unacceptable risk to human health.

Results of all previous investigations indicated that TPH contamination associated with tank releases was not present in groundwater at concentrations exceeding groundwater comparison criteria, except at one location collected in 2003 (see Section 5.2.2). The one sampling location with the maximum TPH-mr concentration exceeding the nondrinking water ESL does not appear

to be representative of groundwater concentrations throughout the school site. Results for samples collected from all other nearby locations during the August 2003 sampling event were below the detection limit for TPH. In addition, TPH concentrations in groundwater samples collected by CH2M Hill from the monitoring wells installed closest to the school site and on the 9th Street and Tisdale Avenue site were below the detection limit for TPH. Figure 6 presents the locations of all monitoring wells and temporary monitoring points as well as analytical results for all samples that exceeded the comparison criterion for TPH-dr and TPH-mr used in this report.

The exposure pathway for human ingestion of groundwater is not complete and concentrations of TPH compared to ESLs based on drinking water criteria are not representative of potential site exposure. As a result, groundwater does not pose an unacceptable risk to human health at the school site.

6.3 AIR

As presented in Section 3.4.3, individuals may be exposed to chemicals in air by inhaling chemicals in a vapor phase or by inhaling chemicals sorbed to soil particulates. Soil and groundwater samples were collected to evaluate potential human health exposure from the air pathway. No VOCs were detected above comparison criteria for soil or groundwater samples in November 2002; therefore, no risk is posed to human health from inhalation of chemicals in the vapor phase.

6.4 SURFACE WATER

As discussed in Section 3.4.4, there is no exposure pathway for surface water because surface water is not present at the site. Consequently, there is no risk to human health associated with exposure to surface water.

6.5 RECOMMENDATIONS FOR THE MARE ISLAND ELEMENTARY SCHOOL

The SI at the school site evaluated whether additional investigation is necessary at the school site in order to determine if the site is ready for property transfer. Additional investigation is not warranted at the school site because results of all investigations of soil and groundwater have not identified any concentrations of chemicals that pose an unacceptable risk to human health.

7.0 REFERENCES

California Department of Health Services. 1990. "Interim Guidance for Preparation of a Preliminary Endangerment Assessment Report, Sacramento, California." Toxic Substances Control Program. June 22.

CH2M Hill. 2003. "Interim Remedial Action Work Plan for Tisdale and 9th Street Site, Lennar Mare Island." July.

CH2M Hill. 2004a. "Draft Remedial Action Summary Report for the Tisdale and 9th Street Site, Lennar Mare Island." February.

CH2M Hill. 2004b. "Request for Permanent Closure of Groundwater at the Former Tisdale Road and 9th Street Site." March 1.

Department of Toxic Substances Control (DTSC). 1999. "LeadSpread Risk Assessment Spreadsheet, Version 7 for Estimating Blood-Lead Concentrations." March. Available Online at: http://www.dtsc.ca.gov/AssessingRisk/leadspread.cfm

DTSC. 2002a. "Comments on the Draft Closure Report, Underground Fuel Oil Piping and TPH Contaminated Soil Removal, Mare Island Elementary School." June 5.

DTSC. 2002b. "Comments on the Draft Human Health Risk Assessment on Greensand at Mare Island Elementary School, Dated March 8, 2002." June 11.

DTSC. 2002c. "Comments on the Human Health Risk Assessment on Greensand at Mare Island Elementary School." August 23.

DTSC. 2002d. "Comments on the Review of Preliminary Remediation Goals for Lead." September 9.

DTSC. 2002e. "Comments on the Final Closure Report, Underground Fuel Oil Piping and TPH Contaminated Soil Removal, Mare Island Elementary School at the Former Mare Island Naval Shipyard, Vallejo, California." November 14.

DTSC. 2004. "Lennar Mare Island, Certification and Termination of Resource Conservation and Recovery Act (RCRA) Corrective Action in Investigation Area D2." July 13.

Foster Wheeler Environmental Corporation (Foster Wheeler). 2001. "Draft Closure Report, Underground Fuel Oil Piping and TPH Contaminated Soil Removal, Mare Island Elementary School." December.

Foster Wheeler. 2002. "Final Closure Report, Underground Fuel Oil Piping and TPH Contaminated Soil Removal, Mare Island Elementary School." September 17.

Geo/Resource Consulting. 1987. "Mare Island Elementary School and Building 765 Chlordane (Phase I) and Asbestos (Phase II) Reports." March 4.

Kleinfelder Associates. 1999. "Report on the Limited Soil and Water Sampling, Mare Island Elementary School, Vallejo, California." September 7.

Kleinfelder Associates. 2003. "Preliminary Endangerment Assessment, Existing Mare Island Elementary School, 400 9th Street, Mare Island." December 5.

Naval Facilities Engineering Command, Engineering Field Activities West. 1998. Electronic Mail Regarding Manufacturing of Green Diamond® Abrasive Material and Abrasive Blast Material Operations at Mare Island. From David Godsey. To Lynne Haroun, Environmental Toxicologist and Risk Analyst, Tetra Tech EM Inc. October 23.

PRC Environmental Management, Inc. (PRC). 1995a. "Focused Human Health Risk Assessment for Buildings 735 and 765, Final." March 17.

PRC. 1995b. "Draft Technical Memorandum, Examination of Groundwater at Mare Island Naval Shipyard for Municipal and Domestic Supply." April 20.

PRC. 1995c. "Preliminary Assessment/Site Inspection Final Summary Report for Nonradiological Sites." May 19.

PRC. 1997a. "Draft Final Remedial Investigation Report, Operable Unit 2, Mare Island, Vallejo, California." January 31.

PRC. 1997b. "Draft Final Group II and III Accelerated Study Field Sampling and Analysis Plan, Mare Island, Vallejo, California." August 5.

Radian Corporation. 1992. "Mare Island Naval Shipyard Buildings 735 and 765, Preliminary Endangerment Assessment." Walnut Creek, California.

Regional Water Quality Control Board (Water Board). 2000. "A Compilation of Water Quality Goals." Staff Report. Prepared by Marshack, J.B. Central Valley Region. Sacramento, California.

Water Board. 2002. "Comments on the Draft Closure Report, Underground Fuel Oil Piping and TPH Contaminated Soil Removal, Mare Island Elementary School." March 7.

Water Board. 2004. "Approval of No Further Action Recommendation at the Former Tisdale Road and 9th Street Site, Investigation Area D2, Mare Island, Vallejo, California." April 14.

Water Board. 2005. "Screening For Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final." February.

Supervisor of Shipbuilding, Conversion, and Repair, Portsmouth, Virginia, Environmental Detachment, Vallejo. 1994. "Basewide Environmental Baseline Survey/Community Environmental Response Facilitation Act Report for Mare Island Naval Shipyard, Vallejo, California." December 15.Tetra Tech EM Inc. (Tetra Tech). 1998a. "Basewide

Polychlorinated Biphenyl Confirmation Sampling Summary Report, Mare Island, Vallejo, California." February 13.

Tetra Tech. 1998b. "November 1997 Phase II Quarterly Groundwater Sampling Report, Mare Island, Vallejo, California." March 9.

Tetra Tech. 1998c. "February/March 1998 Phase II Quarterly Groundwater Sampling Report, Mare Island, Vallejo, California." July 9.

Tetra Tech. 1998d. "May/June 1998 Phase II Quarterly Groundwater Sampling Report, Mare Island, Vallejo, California." October 5.

Tetra Tech. 1999. "August 1998 Phase II Quarterly Groundwater Sampling and Annual Summary Report, Mare Island, Vallejo, California." January 1.

Tetra Tech. 2000. "June/July 1999 Interim Facility-Wide Groundwater Monitoring Program Quarterly Report, Mare Island, Vallejo, California." March 20.

Tetra Tech. 2001. "Draft Preliminary Remediation Goals for Lead, Mare Island, Vallejo California." April 30.

Tetra Tech. 2002a. "Draft Human Health Risk Assessment at Mare Island Elementary School Addendum to the 'Final Technical Memorandum, Human Health Risk and Ecological Assessment on Greensand,' Mare Island, Vallejo, California." March 8.

Tetra Tech. 2002b. "Final Compilation of Technical Memoranda on Ambient Analyses of Metals in Soils and Groundwater, Mare Island, California." April 19.

Tetra Tech. 2002c. "Draft Final Sampling and Analysis Plan for Soil and Groundwater Sampling at the Mare Island Elementary School Site." December.

Tetra Tech. 2003a. "Draft Site Inspection for the Mare Island Elementary School, Mare Island Naval Shipyard, Vallejo, California." February 21.

Tetra Tech. 2003b. "Draft Final Addendum 1 to the Draft Final Sampling and Analysis Plan for Soil and Groundwater Sampling at the Mare Island Elementary School Site." August.

Tetra Tech. 2003c. "Draft Data Summary from August 2003 Mare Island Elementary School Sampling." November.

U.S. Department of the Navy. 2002. "Fact Sheet: Update on Environmental Activities at the Mare Island Elementary School." December.

U.S. Environmental Protection Agency (EPA). 1991. "Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions." Office of Solid Waste and Emergency Response. Directive 9355.0-30. Washington, D.C. Available Online at: http://www.epa.gov/oswer/riskassessment/pdf/baseline.pdf

EPA. 1992. "Guidance for Performing Site Inspections Under CERCLA". EPA/540-R-92-021. September.

EPA. 1995. "EPA Region IX Preliminary Remediation Goals." February.

EPA. 1999. "Improving Site Assessment: Combined PA/SI Assessments." EPA-540-F-98-038 October.

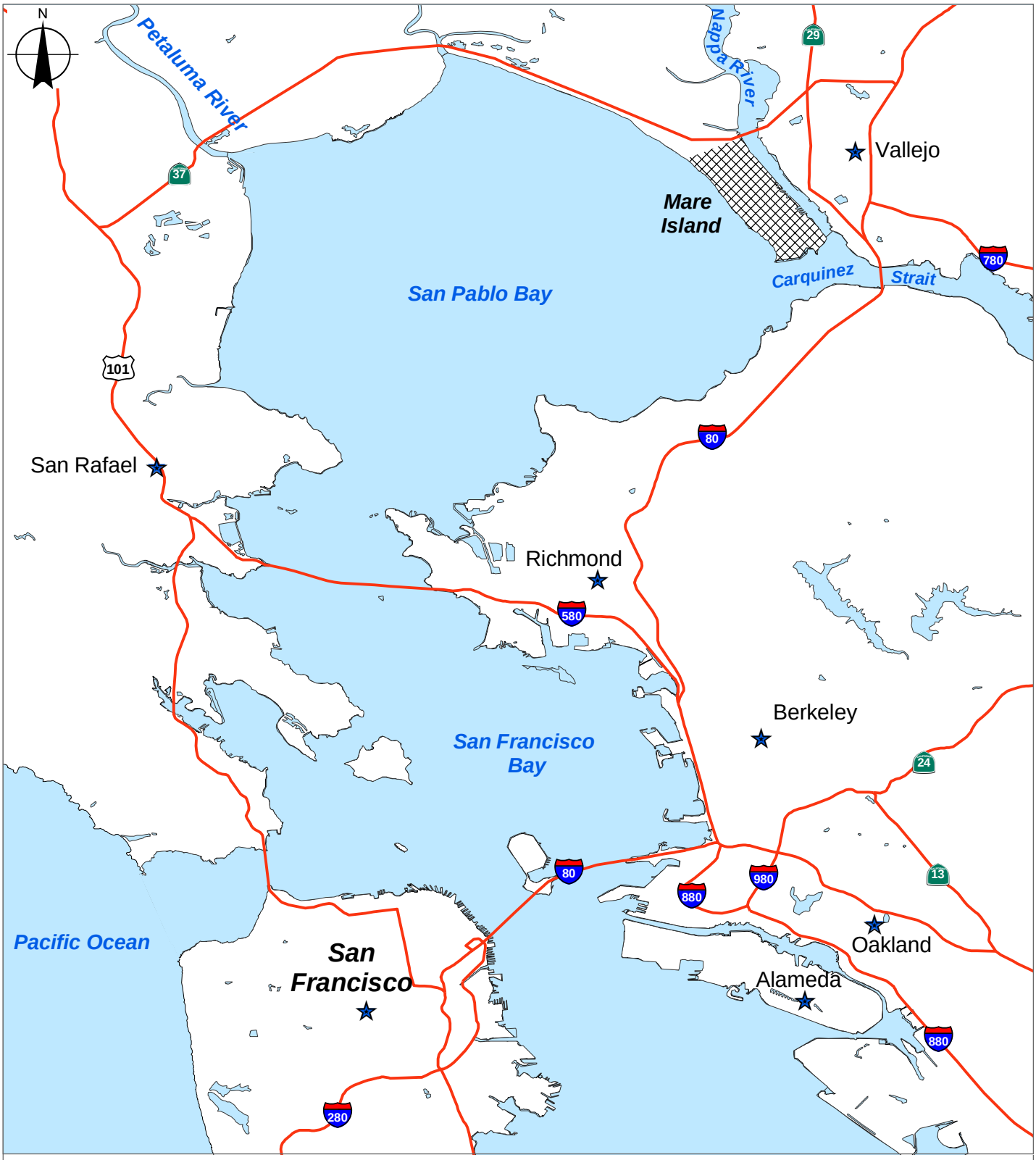
EPA. 2002a. "Comments on the Draft Closure Report, Underground Fuel Oil Piping and TPH Contaminated Soil Removal, Mare Island Elementary School." February 4.

EPA. 2002b. "Comments on the Human Health Risk Assessment on Greensand at Mare Island Elementary School." July 30.

EPA. 2002c. "Comments on the Sampling and Analysis Plan, Soil and Groundwater Sampling at Mare Island Elementary School Site." November 14.

EPA. 2004. "EPA Region IX Preliminary Remediation Goals." October. Available Online: http://www.epa.gov/region09/waste/sfund/prg/index.html

FIGURES



FORMER MARE ISLAND NAVAL SHIPYARD

2 0 2 4
Miles

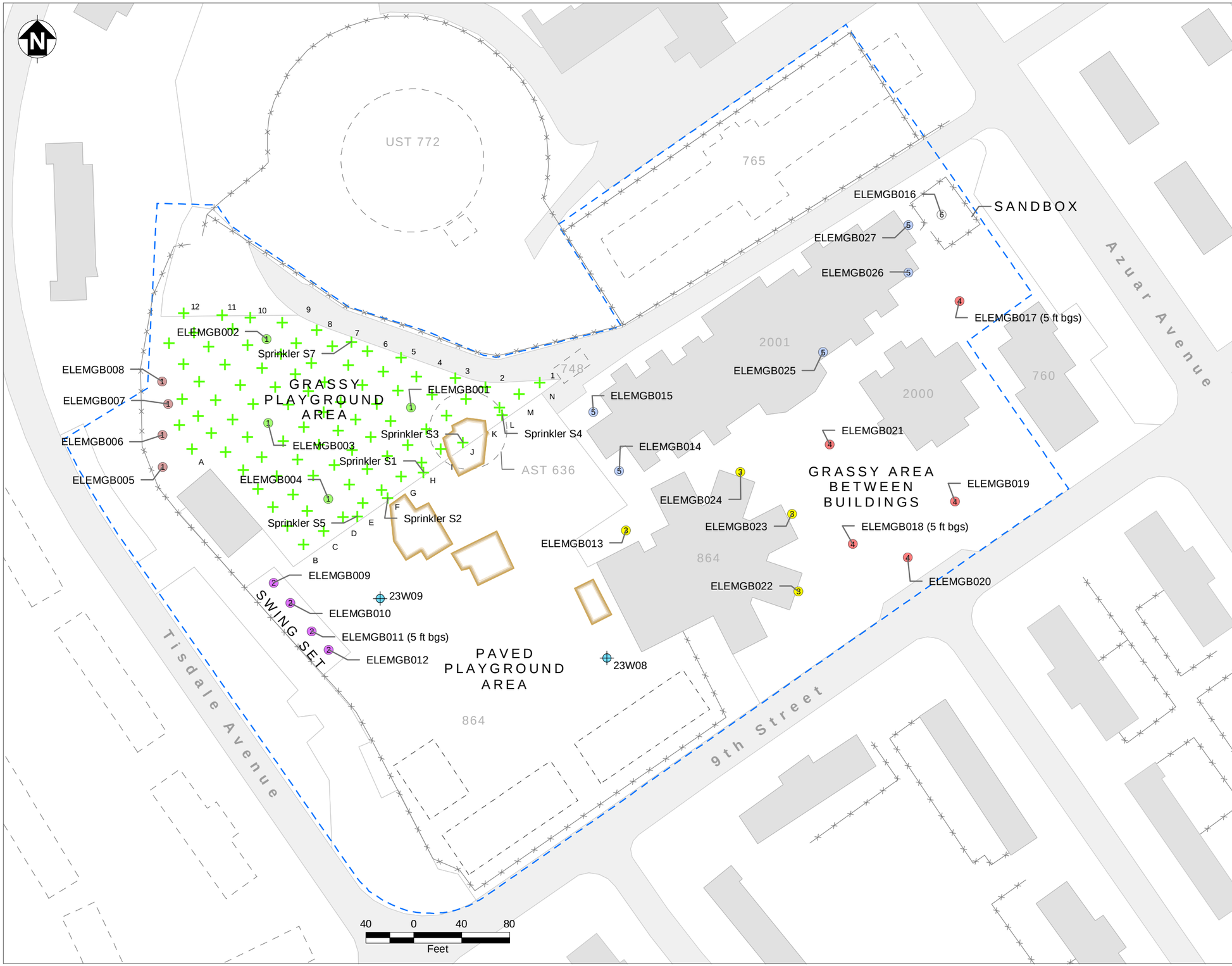
Mare Island, Vallejo, California
U.S. Navy, BRAC PMO West, San Diego, CA

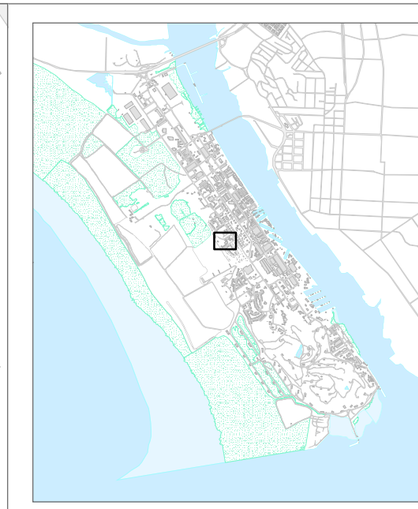
FIGURE 1

REGIONAL VICINITY MAP

Final Site Inspection
for the Mare Island Elementary School

2006/06/13 V:\Projects\DATA_CALLS\School SI 03.06\Fig 1.mxd SULLIVAN SD D. Wise





+ VISUAL INSPECTION BORING

SAMPLING LOCATION

- (1) Area I (Grass) - Grassy Playground
- (1) Area I (Bare Ground) - Grassy Playground
- (2) Area II (Swing Set) - Paved Playground
- (3) Area III - Bare Ground around Building 864
- (4) Area IV - Grassy Area between Buildings 864 and 2000
- (5) Area V - Bare Ground around Building 2001
- (6) Area VI - Sandbox
- MONITORING WELL
- FENCE
- EXCAVATION
- SCHOOL PROPERTY

BASE MAP

- Building/Structure
- Road
- Site Feature
- Wetland
- Mudflat
- Water
- Removed Structure

Notes:
AST Aboveground storage tank
ft bgs Feet below ground surface
UST Underground storage tank

Street names and locations are based on 1998 facility maps.

SULLIVAN

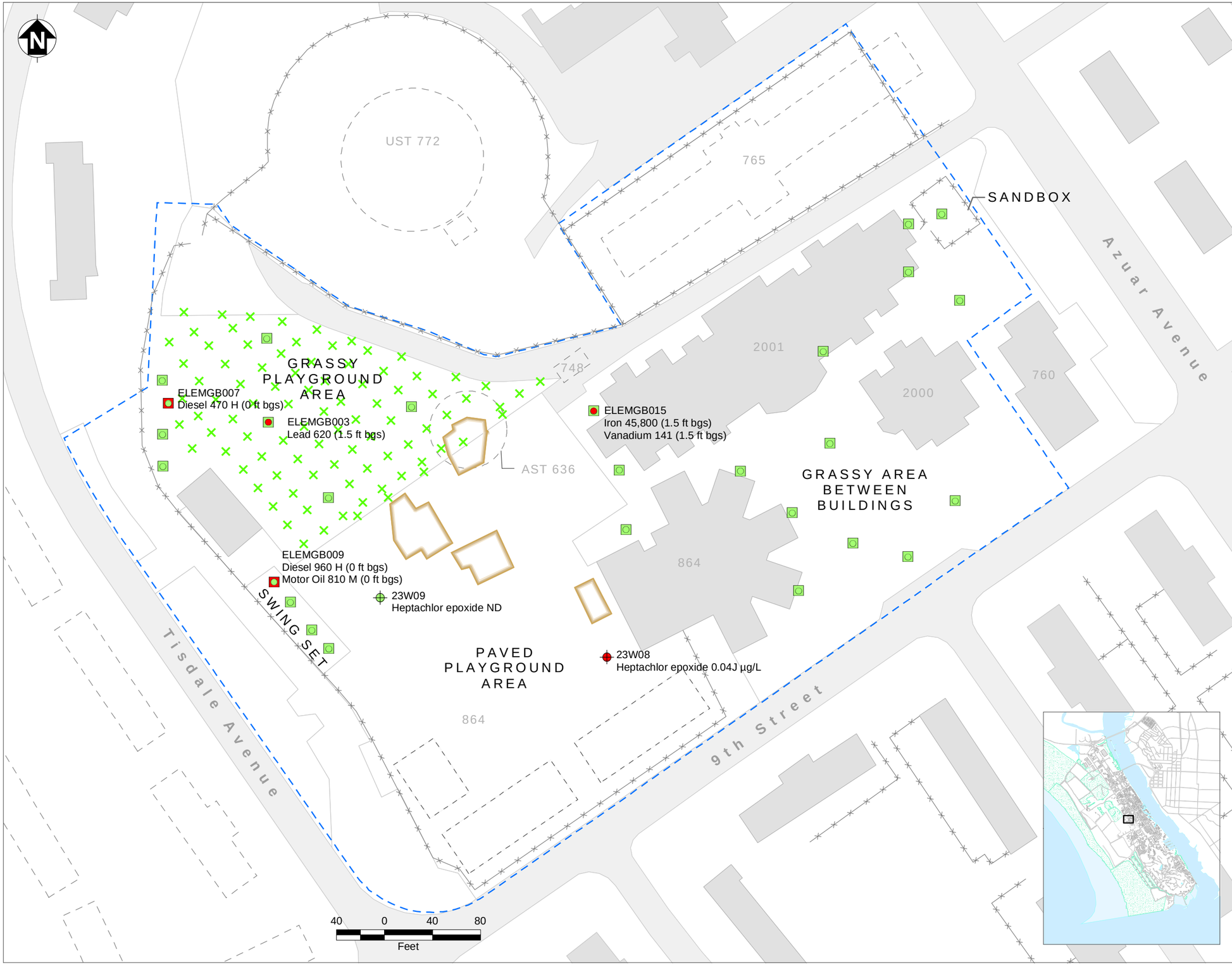
Mare Island, Vallejo, California

U.S. Navy, BRAC PMO West, San Diego, CA

FIGURE 2
SAMPLING AND VISUAL INSPECTION LOCATIONS FOR NOVEMBER 2002

Final Site Inspection
for the Mare Island Elementary School

2006-06-13 V:\Projects\DATA_CALLS\School SI 03.06\Fig 2.mxd SULLIVAN SD (TtEMI-SF Michelle Angeles)



Point Identification
Diesel 470 H (0 ft bgs)

Chemical Name
Concentration in mg/kg
Qualifier (if applicable)
Depth

VISUAL INSPECTION BORING[a]

METALS IN SOIL[b]
- Above Comparison Criteria
- Below Comparison Criteria

TPH IN SOIL[b]
- Above Comparison Criteria
- Below Comparison Criteria

FENCE
EXCAVATION
SCHOOL PROPERTY

BASE MAP
- Building/Structure
- Road
- Site Feature
- Wetland
- Mudflat
- Water
- Removed Structure

Notes:

a	Visual inspection borings were drilled to 2 feet bgs; no greensand was observed in any boring.
b	All sampling locations were sampled at 0 to 0.5 and 1.5 to 2.0 ft bgs.
AST	Aboveground storage tank
ft bgs	Feet below ground surface
H	Hydrocarbon is heavier range than measured analyte
J	Estimated concentration
M	Milligrams per kilogram
mg/kg	Hydrocarbon matched motor oil profile
TPH	Total petroleum hydrocarbons
UST	Underground storage tank
µg/L	Micrograms per liter

Street names and locations are based on 1998 facility maps.

Comparison Criteria for

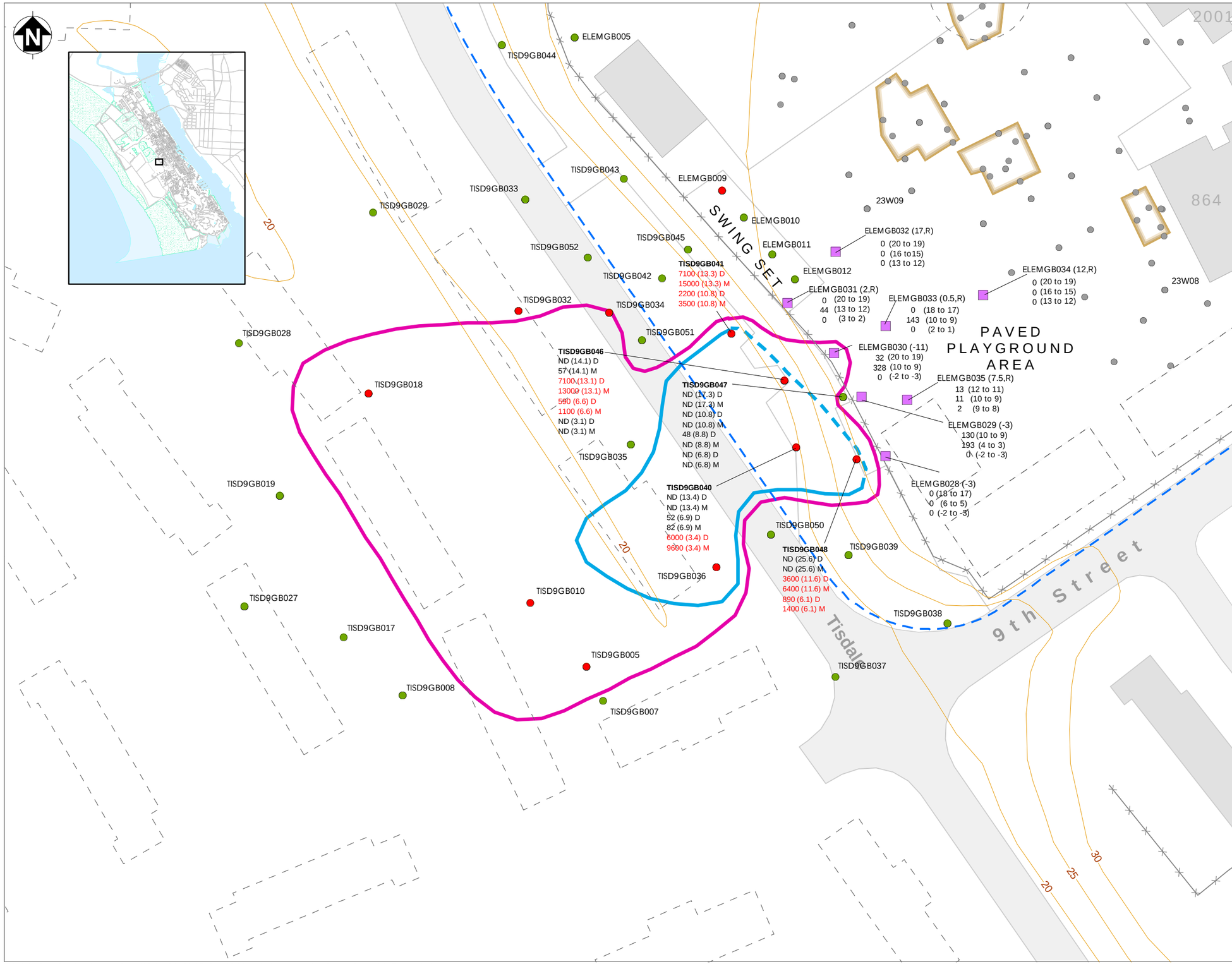
Soil:	Groundwater:
Diesel 400 mg/kg	Heptachlor epoxide 0.0036 µg/L
Iron 44,000 mg/kg	
Lead 59 mg/kg	
Motor Oil 400 mg/kg	
Vanadium 130 mg/kg	

SULLIVAN

Mare Island, Vallejo, California
U.S. Navy, BRAC PMO West, San Diego, CA

FIGURE 3
LOCATIONS WITH CHEMICAL CONCENTRATIONS EXCEEDING COMPARISON CRITERIA FOR NOVEMBER 2002
Final Site Inspection
for the Mare Island Elementary School

2006-06-13 V:\Projects\DATA_CALLS\School SI 03.06\Fig 3.mxd SULLIVAN SD (TtEMI-SF Michelle Angeles)



Point Identification

TISD9GB0XX
36 (7.4) D

Chemical Name
Sample Top Depth (feet msl)
Concentration of TPH (mg/kg)

Boring Identification

ELEMGB028 (2,R)
0 (20 to 19)
0 (13 to 12)
0 (3 to 2)

Bottom Depth (feet msl)
PID Reading
Refusal
Sample Depth (feet msl)

TPH in Soil CH2M Hill* Sample Location

- Above Comparison Criterion
- Below Comparison Criterion

* CH2M Hill TPH result data are provided for background comparison purposes only.

- Navy Step Out Boring Location (Soil Collected 8/19/03 - 8/21/03)
- Previous Navy Sample Location
- School Property
- Excavation

Concentrations of TPH in mg/kg

- Greater than 1,000 mg/kg
- Greater than 500 mg/kg

Base Map

- Building/Structure
- Road
- Site Feature
- Fences
- Ground Elevation Contour (in feet above msl)

Notes:

D	Hydrocarbon matched diesel profile
M	Hydrocarbon matched motor oil profile
mg/kg	Milligram per kilogram
msl	Mean sea level
ND	Not detected
TPH	Total petroleum hydrocarbons
R	Depth at which refusal was encountered

Elevation (msl) for new locations based on 23W09 elevation. Negative elevations correspond to elevations below mean sea level.

TPH Comparison Criterion for Soil: 400 mg/kg

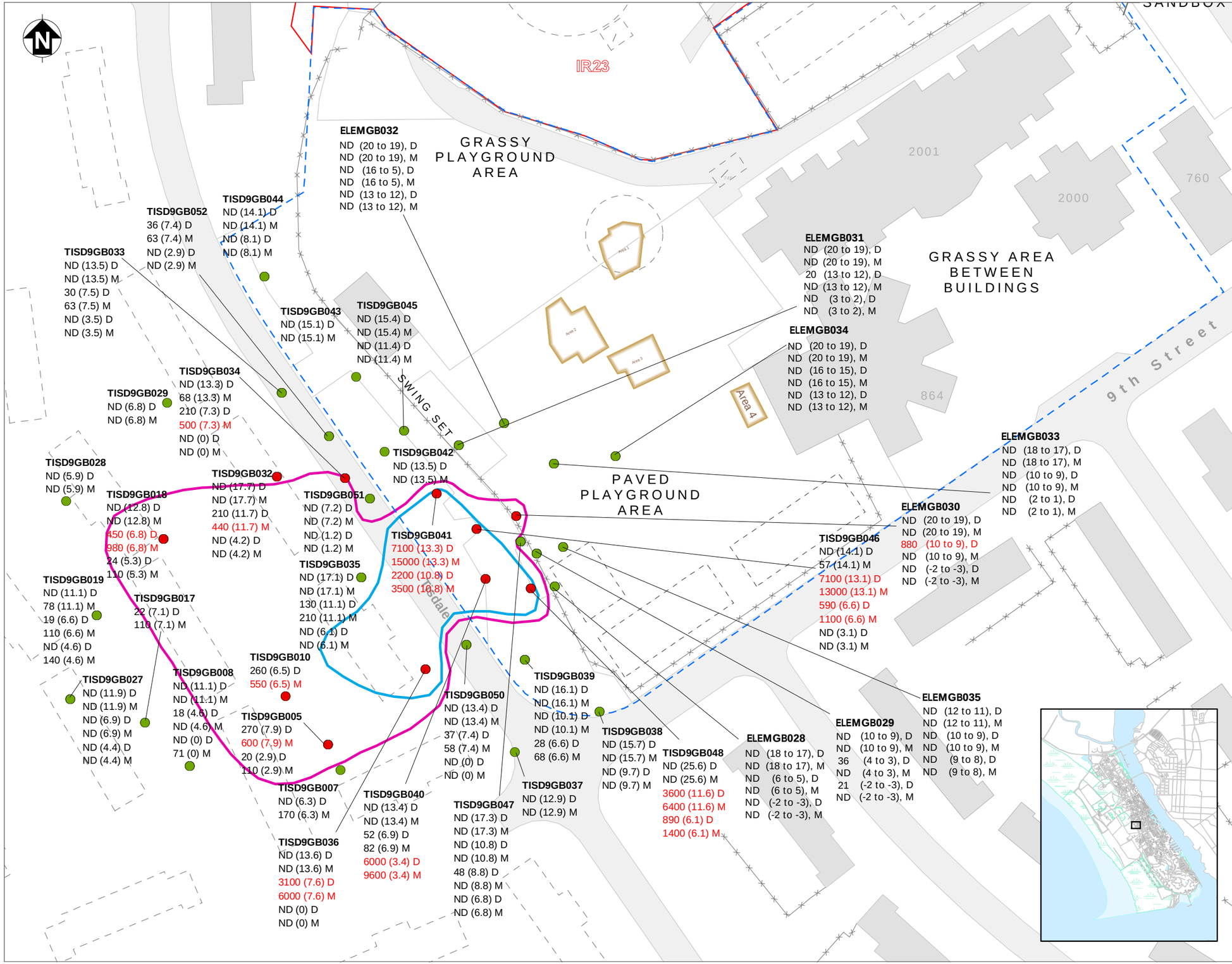
60 0 60
Feet

SULLIVAN

Mare Island, Vallejo, California
U.S. Navy, BRAC PMO West, San Diego, CA

FIGURE 4
SAMPLING LOCATIONS FOR AUGUST 2003 PRIOR TO REMEDIATION
Final Site Inspection
for the Mare Island Elementary School

2006-04-04 V:\Projects\DATA_CALLS\School SI 03.06\Fig 4 03.06.mxd SULLIVAN SD (TtEMI-SF Michelle Angeles)



Point Identification

TISD9GB0XX
36 (7.4) D

Chemical Name
Sample Top Depth (feet msl)
Concentration of TPH (mg/kg)

TPH in Soil

- TPH Result Below Comparison Criterion
- TPH Result Above Comparison Criterion
- Fences
- School Property
- Excavation

Concentrations of TPH in mg/kg

- Greater than 1,000 mg/kg
- Greater than 500 mg/kg
- Building/Structure
- Road
- Site Feature
- Removed Structure

Notes:
Units for soil results are in mg/kg.
Navy sample locations are indicated by point identification designations in the format ELEMGB...
CH2M Hill* sample locations are indicated by point identification designations in the format TISD9GB...
* CH2M Hill TPH result data are provided for background comparison purposes only.

D Hydrocarbon matched diesel profile
M Hydrocarbon matched motor oil profile
mg/kg Milligram per kilogram
msl Mean sea level
ND Not detected
TPH Total petroleum hydrocarbons

TPH Comparison Criterion for Soil: 400 mg/kg

40 0 40 80
Feet

SULLIVAN

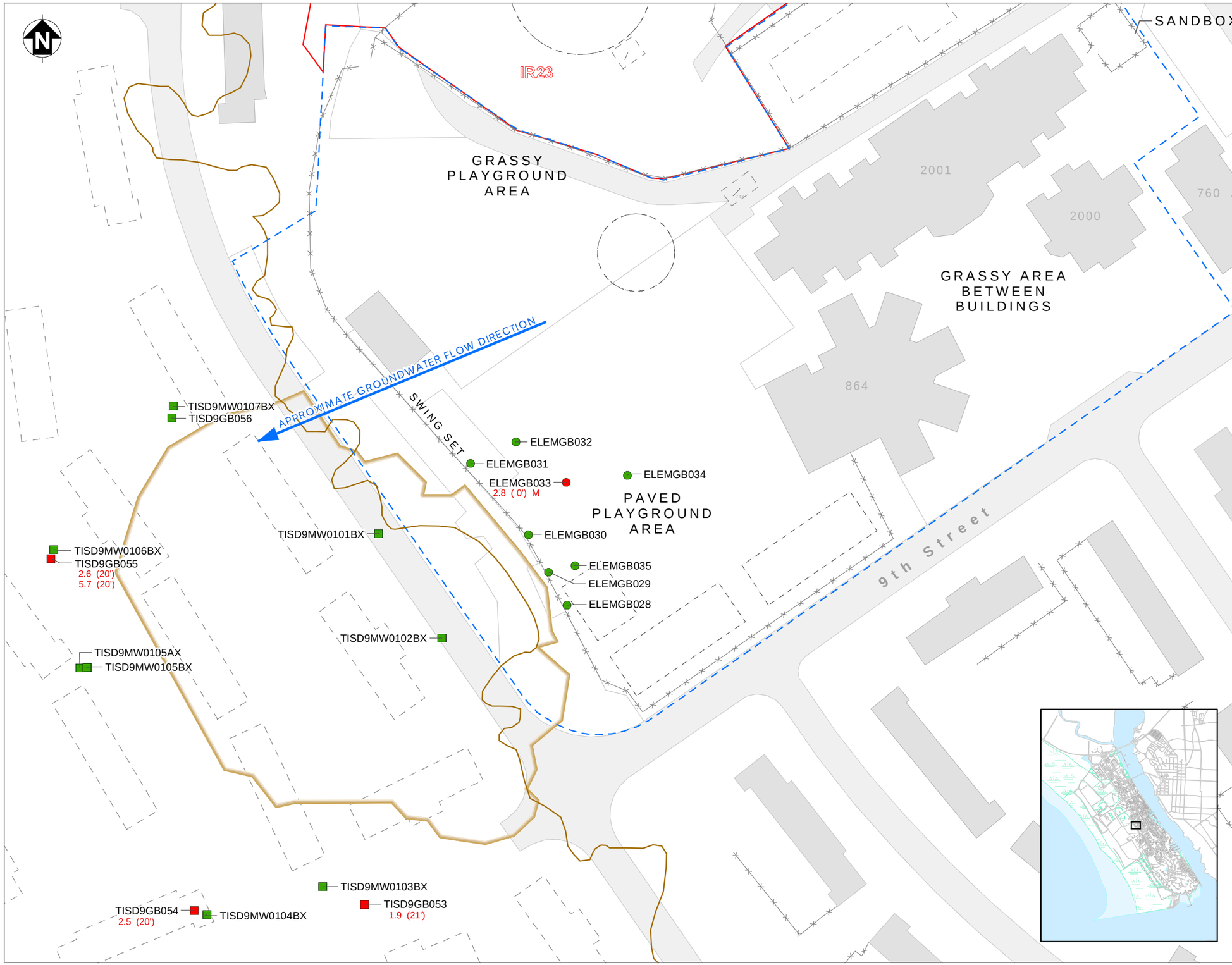
Mare Island, Vallejo, California
U.S. Navy, BRAC PMO West, San Diego, CA

FIGURE 5

TPH IN SOIL PRIOR TO REMEDIATION

Final Site Inspection
for the Mare Island Elementary School

2006-03-28 V:\Projects\DATA_CALLS\School SI 03.06\Fig 5 03.06.mxd SULLIVAN SD (TtEMI-SF Michelle Angeles)



Point Identification

TISD9GB0XX
36 (7.4) D

Chemical Name
Sample Top Depth (feet msl)
Concentration of TPH (mg/L)

TPH in Groundwater, Navy Sample Location
- Below Comparison Criterion
- Above Comparison Criterion

TPH in Groundwater, CH2M Hill* Sample Location
- Below Comparison Criterion
- Above Comparison Criterion

* CH2M Hill TPH result data are provided for background comparison purposes only.

- Fences
- Historic Mare Island Shoreline, 1921
- Installation Restoration Site 23 Boundary
- School Property
- Approximate Location of CH2M Hill Excavation Boundary
- Building/Structure
- Road
- Site Feature
- Removed Structure

Notes:
Only results above criterion are posted.
Units for groundwater results are in mg/L.

M	Hydrocarbon matched motor oil profile
mg/L	Milligram per liter
msl	Mean sea level
TPH	Total petroleum hydrocarbons

TPH Comparison Criterion for Groundwater: 1.4 mg/L

40 0 40 80
Feet

SULLIVAN

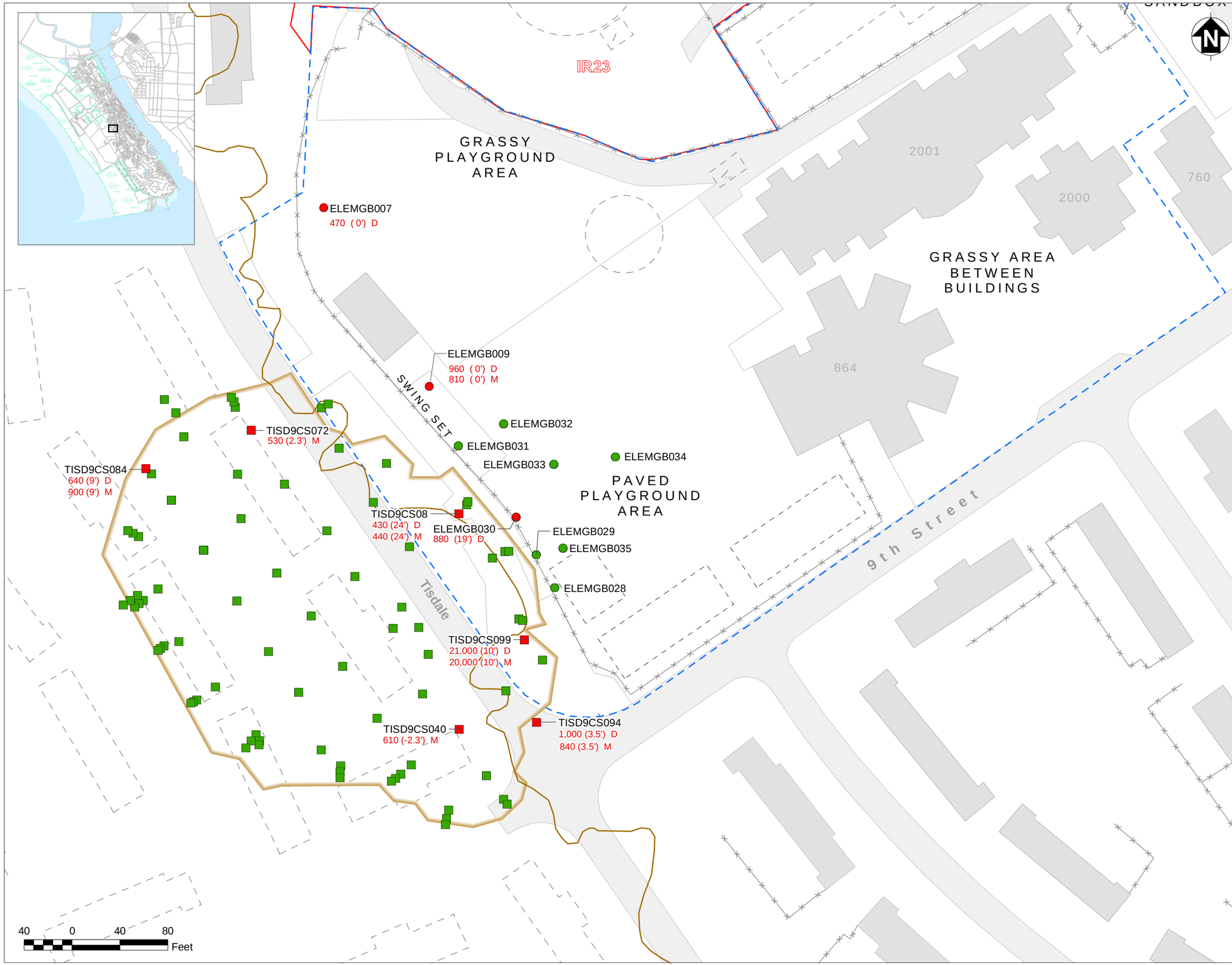
Mare Island, Vallejo, California
U.S. Navy, BRAC PMO West, San Diego, CA

FIGURE 6

TPH IN GROUNDWATER POST-REMEDIATION

Final Site Inspection
for the Mare Island Elementary School

2006-03-28 V:\Projects\DATA_CALLS\School SI 03.06\Fig 6 03.06.mxd SULLIVAN SD



Point Identification

TISD9GB0XX
36 (7.4) D

Chemical Name
Sample Top Depth (feet msl)
Concentration of TPH (mg/kg)

TPH in Soil, Navy Sample Location
- Below Comparison Criterion
- Above Comparison Criterion

TPH in Soil, CH2M Hill* Sample Location
- Below Comparison Criterion
- Above Comparison Criterion

* CH2M Hill TPH result data are provided for background comparison purposes only.

- Historic Mare Island Shoreline, 1921
- Fences
- School Property
- Approximate Location of CH2M Hill Excavation Boundary
- Building/Structure
- Road
- Site Feature
- Removed Structure

Notes:
Only results above criterion are posted.
Units for soil results are in mg/kg.

D	Hydrocarbon matched diesel profile
M	Hydrocarbon matched motor oil profile
mg/kg	Milligram per kilogram
msl	Mean sea level
TPH	Total petroleum hydrocarbons

TPH Comparison Criterion for Soil: 400 mg/kg

SULLIVAN

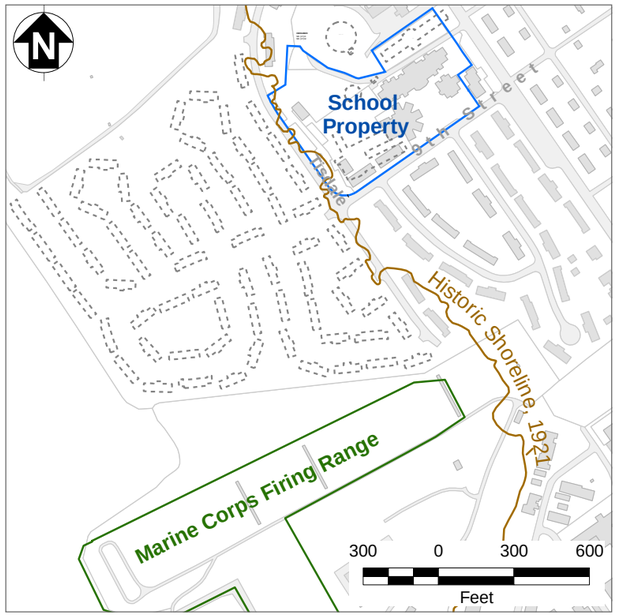
Mare Island, Vallejo, California
U.S. Navy, BRAC PMO West, San Diego, CA

FIGURE 7

TPH IN SOIL POST-REMEDIATION

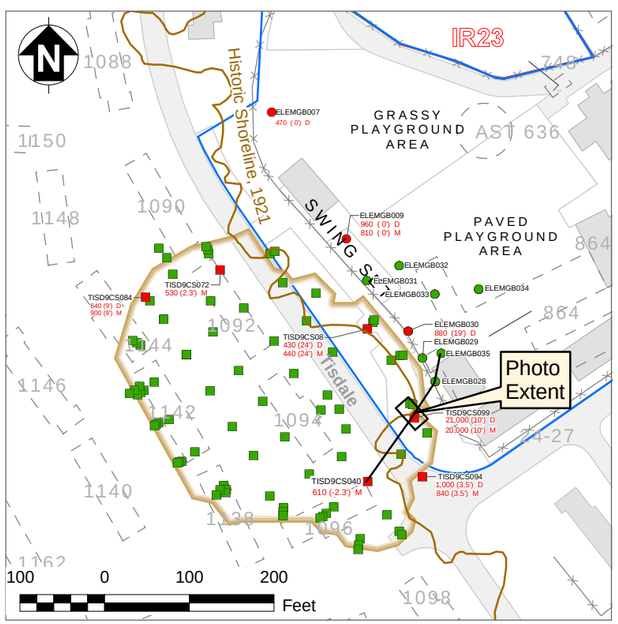
Final Site Inspection
for the Mare Island Elementary School

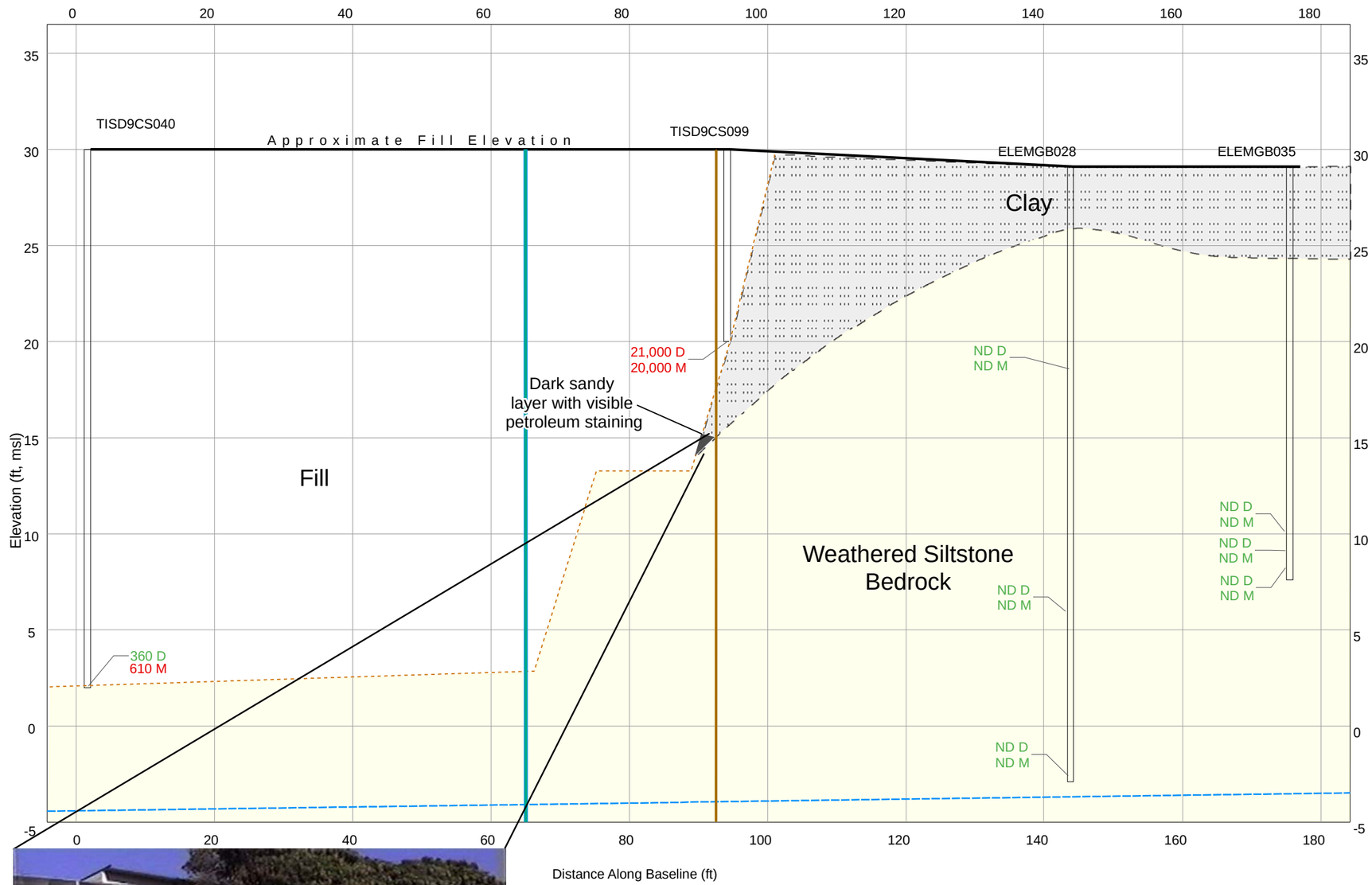
2006-03-28 V:\Projects\DATA_CALLS\School SI 03.06\Fig 7 03.06.mxd SULLIVAN SD



Notes:
Analytical and groundwater data from "Request for Permanent Closure of Groundwater at the Former Tisdale Road and 9th Street Site" (CH2MHill 2004b).

Groundwater data from nearest CH2MHill operated well TISD9MW102B reports wet season groundwater elevation at -4.91 feet below mean sea level (ft msl) and dry season at -8.70 ft msl.





Excavation wall photo (looking East) showing dark sandy layer with visible petoleum staining.

Legend

- NAVY Property Line
- Approximate Wet Season Groundwater Elevation
- Ground Surface
- Approximate Excavation Boundary
- Historic Shoreline, Mare Island (1921)

SULLIVAN

Mare Island, Vallejo, California
U.S. Navy, BRAC PMO West, San Diego, CA

FIGURE 8
GEOLOGIC CROSS SECTION AND CONCEPTUAL SITE MODEL

Final Site Inspection
for the Mare Island Elementary School

06/23/2006 V:\Projects\DATA_CALLS\School SI 03.06\Fig 8 profile_rev3.mxd SULLIVAN - SD S. DeGross

TABLES

TABLE 1: SELECTION OF COMPARISON CRITERIA

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Matrix	Comparison Criteria	Source
Soil	**Inorganic Chemicals** **Lead**: 210 mg/kg	DTSC 1999 Tetra Tech 2001
	Other Inorganic Chemicals The higher of the following: (1) EPA 2004 Region IX residential PRGs or (2) the Mare Island ambient concentration. The Mare Island ambient is defined as the lower of the ambient native soil concentration (95th percentile) or the ambient fill concentration (95th percentile).	EPA 2004 Tetra Tech 2002b
	Organic Chemicals **TPH-dr and TPH-mr:** 400 mg/kg **TPH-gr:** 150 mg/kg **PAHs:** EPA Region IX 2004 residential PRGs.	PRC 1997b PRC 1997b EPA 2004
	Other Organic Chemicals EPA Region IX 2004 residential PRGs	EPA 2004
Groundwater	**Inorganic Chemicals** The higher of the following: (1) Mare Island ambient concentrations for groundwater (95th percentile) or (2) the lower of the marine or freshwater chronic AWQC.	Tetra Tech 2002b RWQCB 2000
	Organic Chemicals **TPH-dr**, **TPH-gr**, **and TPH mr:** 1.4 mg/L	PRC 1997b
	Other Organic Chemicals (1) The lower of the marine or freshwater chronic AWQC, or (2) if no chronic AWQC exists, then the lower of the marine or freshwater acute AWQC.	RWQCB 2000

TABLE 1: SELECTION OF COMPARISON CRITERIA (CONTINUED)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Notes:

AWQC	Ambient Water Quality Criteria
DTSC	Department of Toxic Substances Control
EPA	U.S. Environmental Protection Agency
mg/kg	Milligram per kilogram
mg/L	Milligram per liter
PAH	Polynuclear aromatic hydrocarbon
PRC	PRC Environmental Management, Inc.
PRG	Preliminary remediation goal
RWQCB	Regional Water Quality Control Board
Tetra Tech	Tetra Tech EM Inc.
TPH	Total petroleum hydrocarbons
TPH-dr	Total petroleum hydrocarbons as diesel
TPH-gr	Total petroleum hydrocarbons as gasoline
TPH-mr	Total petroleum hydrocarbons as motor oil

Sources:

DTSC. 1999. "LeadSpread Risk Assessment Spreadsheet, Version 7 for Estimating Blood-Lead Concentrations." March. Available Online at: http://www.dtsc.ca.gov/AssessingRisk/leadspread.cfm

EPA. 2004. Region IX Preliminary Remediation Goals. October. Available Online at: http://www.epa.gov/region09/waste/sfund/prg/index.html

PRC. 1997b. "Draft Final Group II and III Accelerated Study Field Sampling and Analysis Plan. Mare Island." August 5.

RWQCB. 2000. "A Compilation of Water Quality Goals." Staff Report. Prepared by Marshack, J.B. Central Valley Region. Sacramento, California.

Tetra Tech. 2001. "Draft Preliminary Remediation Goals for Lead, Mare Island, Vallejo California." April 30.

Tetra Tech. 2002b. "Final Compilation of Technical Memoranda on Ambient Analyses of Metals in Soils and Groundwater, Mare Island, California." April 19.

TABLE 2: COMPARISON CRITERIA FOR SOIL AND GROUNDWATER

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, CA

	Soil Criterion				Groundwater Criterion			
Analyte	Mare Island Ambient Native Soil (mg/kg)[a]	Mare Island Ambient Fill (mg/kg)[a]	Residential PRGs[b] (mg/kg)	Mare Island Soil Comparison Criteria[c] (mg/kg)	Mare Island Ambient Groundwater[a] (µg/L)	Ambient Water Quality Criterion (µg/L)	Ambient Water Quality Criterion Source[d]	Mare Island Groundwater Comparison Criteria[e] (ug/L)
Metals								
Aluminum	26,000	35,000	76,000	76,000	480	87	ß	480
Antimony	1.3	8.5	31	31	5.6	30	ß	30
Arsenic	16	36	0.39	16	78	36	Γ	78
Barium	NA	NA	5,400	5,400	1,200	NA	NA	1200
Beryllium	1.8	0.9	150	150	1.6	5.3	ß	5.3
Cadmium	3.5	5.2	37	37	16	1	ß	16
Calcium	NA	NA	NP	NP	680,000	NA	NA	680,000
Chromium	56	140	210	210	22	74	ß	74
Chromium VI	NA	NA	30	30	NA	11	ß	11
Cobalt	NA	NA	900	900	100	NA	NA	100
Copper	210	120	3100	3,100	33	3.1	Γ	33
Iron	44,000	62,000	23,000	44,000	140,000	1,000	ß	140,000
Lead	33	59	210[f]	210	10	2.5	ß	10
Magnesium	NA	NA	NP	NP	1,500,000	NA	NA	1,500,000
Manganese	560	1,600	1,800	1,800	5,400	NA	NA	5,400
Mercury	NA	2	23	23	0.22	0.025	Γ	0.22
Molybdenum	NA	NA	390	390	8.8	NA	NA	8.8
Nickel	70	130	1600	1,600	7.5	8.2	Γ	8.2
Selenium	NA	NA	390	390	12	5	ß	12
Silver	NA	NA	390	390	15	0.19	ß	15
Sodium	NA	NA	NP	NP	7,400,000	NA	NA	7,400,000
Thallium	NA	NA	5.2	5.2	NA	40	ß	40
Vanadium	130	190	78	130	140	NA	NA	140
Zinc	100	230	23,000	23,000	260	81	Γ	260
Volatile Organic Compounds								
1,1,1-Trichloroethane	NA	NA	1,200	1,200	NA	1,800	δ	1,800
1,1,2,2-Tetrachloroethane	NA	NA	0.41	0.41	NA	2,400	ß	2,400
1,1,2-Trichloroethane	NA	NA	0.73	0.73	NA	9,400	ß	9,400
1,1-Dichloroethane	NA	NA	2.8	2.80	NA	NA	NA	0
1,1-Dichloroethene	NA	NA	124	124	NA	1,160	δ	1,160
1,2-Dichloroethane	NA	NA	0.28	0.28	NA	20,000	ß	20,000
1,2-Dichloroethene (cis)	NA	NA	43	43	NA	NA	NA	NA
1,2-Dichloroethene (trans)	NA	NA	69	69	NA	NA	NA	NA
1,2-Dichloropropane	NA	NA	0.34	0.34	NA	3,040	Γ	3,040
2-Butanone	NA	NA	22,311	22,311	NA	NA	NA	NA
2-Hexanone	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-Pentanone	NA	NA	5,281	5,281	NA	NA	NA	NA
Acetone	NA	NA	14,127	14,127	NA	NA	NA	NA
Benzene	NA	NA	0.64	0.64	NA	510	Ψ	510
Bromodichloromethane	NA	NA	0.82	0.82	NA	6,400	Γ	6,400
Bromoform	NA	NA	62	62	NA	6,400	Γ	6,400
Bromomethane	NA	NA	3.9	3.9	NA	6,400	Γ	6400
Carbon Disulfide	NA	NA	360	360	NA	NA	NA	NA
Carbon Tetrachloride	NA	NA	0.25	0.25	NA	6,400	Γ	6,400
Chlorobenzene	NA	NA	150	150	NA	129	Γ	129

TABLE 2: COMPARISON CRITERIA FOR SOIL AND GROUNDWATER (CONTINUED)
Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, CA

Analyte	Soil Criterion			Mare Island Soil Comparison Criteria[c] (mg/kg)	Groundwater Criterion			Mare Island Groundwater Comparison Criteria[e] (ug/L)
	Mare Island Ambient Native Soil (mg/kg)[a]	Mare Island Ambient Fill (mg/kg)[a]	Residential PRGs[b] (mg/kg)		Mare Island Ambient Groundwater[a] (µg/L)	Ambient Water Quality Criterion (µg/L)	Ambient Water Quality Criterion Source[d]	
Volatile Organic Compounds (Continued)								
Chloroethane	NA	NA	3	3	NA	NA	NA	NA
Chloroform	NA	NA	0.22	0.22	NA	1,240	ß	1,240
Chloromethane	NA	NA	47	47	NA	6,400	Γ	6,400
Cis-1,3-Dichloropropene	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	NA	NA	1.1	1.1	NA	6,400	Γ	6,400
Ethylbenzene	NA	NA	395	395	NA	430	Y	430
Methylene Chloride	NA	NA	9.1	9.1	NA	NA	NA	NA
Styrene	NA	NA	1,700	1,700	NA	NA	NA	NA
Tetrachloroethene	NA	NA	0.48	0.48	NA	450	Γ	450
Toluene	NA	NA	520	520	NA	5,000	Γ	5,000
Total VOCs 8260	NA	NA	NA	0	NA	NA	NA	NA
Trans-1,3-Dichloropropene	NA	NA	NA	0	NA	NA	NA	NA
Trichloroethene	NA	NA	0.053	0.053	NA	200	Ψ	200
Vinyl Acetate	NA	NA	430	430	NA	NA	NA	NA
Vinyl Chloride	NA	NA	0.079	0.079	NA	0.5	Φ	0.5
Xylene (total)	NA	NA	270	270	NA	NA	NA	NA
Polycyclic Aromatic Hydrocarbons								
Benzo(a)anthracene	NA	NA	0.62	0.62	NA	30	Ψ	30
Benzo(a)pyrene	NA	NA	0.062	0.06	NA	30	Ψ	30
Benzo(b)fluoranthene	NA	NA	0.62	0.62	NA	30	Ψ	30
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	30	Ψ	30
Benzo(k)fluoranthene	NA	NA	0.38	0.38	NA	30	Ψ	30
Dibenz(a,h)anthracene	NA	NA	0.062	0.06	NA	30	Ψ	30
Fluoranthene	NA	NA	2,300	2,300	NA	16	Γ	16
Fluorene	NA	NA	2,700	2,700	NA	300	Y	300
Indeno(1,2,3-cd)pyrene	NA	NA	0.62	0.62	NA	30	Ψ	30
Pyrene	NA	NA	2,300	2,300	NA	30	Ψ	30
Semivolatile Organic Compounds								
1,2,4-Trichlorobenzene	NA	NA	650	650	NA	129	Γ	129
1,2-Dichlorobenzene	NA	NA	600	600	NA	129	Γ	129
1,3-Dichlorobenzene	NA	NA	531	531	NA	129	Γ	129
1,4-Dichlorobenzene	NA	NA	3.4	3.4	NA	129	Γ	129
2,2'-Oxybis(1-Chloropropane)	NA	NA	2.9	2.9	NA	NA	NA	NA
2,4,5-Trichlorophenol	NA	NA	6,100	6,100	NA	11	Γ	11
2,4,6-Trichlorophenol	NA	NA	6.9	6.9	NA	970	ß	970
2,4-Dichlorophenol	NA	NA	180	180	NA	365	ß	365
2,4-Dimethylphenol	NA	NA	1,200	1,200	NA	110	Γ	110
2,4-Dinitrophenol	NA	NA	120	120	NA	NA	NA	NA
2,4-Dinitrotoluene	NA	NA	120	120	NA	NA	NA	NA
2,6-Dinitrotoluene	NA	NA	61	61	NA	230	ß	230
2-Chloronaphthalene	NA	NA	4,900	4,900	NA	0.75	Ψ	0.75
2-Chlorophenol	NA	NA	63	63	NA	438	δ	438
2-Methylnaphthalene	NA	0.3	NA	0.3	NA	30	Ψ	30
2-Methylphenol	NA	NA	3,100	3100	NA	NA	NA	NA

TABLE 2: COMPARISON CRITERIA FOR SOIL AND GROUNDWATER (CONTINUED)
Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, CA

Analyte	Soil Criterion			Mare Island Soil Comparison Criteria[c] (mg/kg)	Groundwater Criterion			Mare Island Groundwater Comparison Criteria[e] (ug/L)
	Mare Island Ambient Native Soil (mg/kg)[a]	Mare Island Ambient Fill (mg/kg)[a]	Residential PRGs[b] (mg/kg)		Mare Island Ambient Groundwater[a] (µg/L)	Ambient Water Quality Criterion (µg/L)	Ambient Water Quality Criterion Source[d]	
Semivolatile Organic Compounds (Continued)								
2-Nitroaniline	NA	NA	183	183	NA	NA	NA	NA
2-Nitrophenol	NA	NA	NA	NA	NA	23	δ	23
3,3'-Dichlorobenzidine	NA	NA	1.1	1.1	NA	NA	NA	NA
3-Nitroaniline	NA	NA	18	18	NA	NA	NA	NA
4,6-Dinitro-2-Methylphenol	NA	NA	6	6	NA	23	δ	23
4-Bromophenyl-Phenyl Ether	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloro-3-Methylphenol	NA	NA	NA	NA	NA	3	δ	3
4-Chloroaniline	NA	NA	240	240	NA	NA	NA	NA
4-Chlorophenyl-Phenyl Ether	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	NA	NA	310	310	NA	NA	NA	NA
4-Nitroaniline	NA	NA	23	23	NA	NA	NA	NA
4-Nitrophenol	NA	NA	NA	NA	NA	23	δ	23
Acenaphthene	NA	0.27	3,700	3,700	NA	710	Γ	710
Acenaphthylene	NA	0.11	NA	NA	NA	30	Ψ	30
Anthracene	NA	0.33	22,000	22,000	NA	30	Ψ	30
Bis(2-chloroethoxy)methane	NA	NA	NA	NA	NA	4.4	λ	4.4
Bis(2-chloroethyl)ether	NA	NA	0.21	0.21	NA	122	ß	122
Bis(2-ethylhexyl)phthalate	NA	NA	35	35	NA	160	ß	160
Butylbenzylphthalate	NA	NA	12,000	12,000	NA	3	ß	3
Carbazole	NA	NA	24	24	NA	NA	NA	NA
Chrysene	NA	1.1	3.8	3.8	NA	30	Ψ	30
Dibenzofuran	NA	NA	145	145	NA	NA	NA	NA
Diethylphthalate	NA	NA	49,000	49,000	NA	3	ß	3
Dimethylphthalate	NA	NA	100,000	100,000	NA	3	ß	3
Di-N-Butylphthalate	NA	NA	6,100	6,100	NA	3	ß	3
Di-N-Octylphthalate	NA	NA	2,400	2,400	NA	3	ß	3
Hexachlorobenzene	NA	NA	0.3	0.3	NA	3.68	ß	3.68
Hexachlorobutadiene	NA	NA	6.2	6.2	NA	9.3	ß	9.3
Hexachlorocyclopentadiene	NA	NA	370	370	NA	5.2	ß	5.2
Hexachloroethane	NA	NA	35	35	NA	540	ß	540
Isophorone	NA	NA	510	510	NA	1290	Ψ	1,290
Naphthalene	NA	0.32	1.7	1.7	NA	620	ß	620
Nitrobenzene	NA	NA	20	20	NA	NA	NA	NA
N-Nitroso-Di-N-Propylamine	NA	NA	0.069	0.069	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NA	NA	99	99	NA	585	δ	585
Pentachlorophenol	NA	NA	3	3	NA	2.1	ß	2.1
Phenanthrene	NA	1	NA	1	NA	4.6	Γ	4.6
Phenol	NA	NA	18,331	18,331	NA	2,560	ß	2,560
Pesticides								
4,4'-DDD	NA	NA	2.4	2.4	NA	0.06	δ	0.06
4,4'-DDE	NA	NA	1.7	1.7	NA	1.4	Ψ	1.4
4,4'-DDT	NA	NA	1.7	1.7	NA	0.001	ß	0.001
Aldrin	NA	NA	0.029	0.029	NA	0.13	Ψ	0.13
alpha-BHC	NA	NA	0.09	0.09	NA	NA	NA	NA

TABLE 2: COMPARISON CRITERIA FOR SOIL AND GROUNDWATER (CONTINUED)
Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, CA

Analyte	Soil Criterion				Groundwater Criterion			
	Mare Island Ambient Native Soil (mg/kg)[a]	Mare Island Ambient Fill (mg/kg)[a]	Residential PRGs[b] (mg/kg)	Mare Island Soil Comparison Criteria[c] (mg/kg)	Mare Island Ambient Groundwater[a] (µg/L)	Ambient Water Quality Criterion (µg/L)	Ambient Water Quality Criterion Source[d]	Mare Island Groundwater Comparison Criteria[e] (ug/L)
Pesticides (Continued)								
Alpha-Chlordane	NA	NA	1.6	1.6	NA	0.004	Γ	0.004
Dieldrin	NA	NA	0.03	0.03	NA	0.0019	Γ	0.0019
Endrin	NA	NA	18	18	NA	0.0023	Γ	0.0023
gamma-BHC (Lindane)	NA	NA	0.44	0.44	NA	0.08	ß	0.08
gamma-Chlordane	NA	NA	1.6	1.6	NA	0.004	Γ	0.004
Heptachlor	NA	NA	0.11	0.11	NA	0.0036	Γ	0.0036
Heptachlor Epoxide	NA	NA	0.053	0.053	NA	0.0036	Γ	0.0036
Methoxychlor	NA	NA	310	310	NA	0.03	ß	0.03
Toxaphene	NA	NA	0.44	0.44	NA	0.0002	ß	0.0002
Polychlorinated Biphenyls								
Aroclor-1016	NA	NA	3.9	3.9	NA	0.014	ß	0.014
Aroclor-1221	NA	NA	0.22	0.22	NA	0.014	ß	0.014
Aroclor-1232	NA	NA	0.22	0.22	NA	0.014	ß	0.014
Aroclor-1242	NA	NA	0.22	0.22	NA	0.014	ß	0.014
Aroclor-1248	NA	NA	0.22	0.22	NA	0.014	ß	0.014
Aroclor-1254	NA	NA	0.22	0.22	NA	0.014	ß	0.014
Aroclor-1260	NA	NA	0.22	0.22	NA	0.014	ß	0.014
Petroleum Indicators								
Diesel Range	NA	NA	400[g]	400	NA	1,400	*	1,400
Gasoline Range	NA	NA	150[g]	150	NA	1,400	*	1,400
Motor Oil Range	NA	NA	400[g]	400	NA	1,400	*	1,400
Total TPH	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

a All values are the 95th percentile concentrations.
Source for metals: Tetra Tech. 2002b. "Final Compilation of Technical Memoranda on Ambient Analyses of Metals in Soils and Groundwater, Mare Island, California." April 19.
Source for PAHs: Tetra Tech. 1998d. "Draft Technical Memorandum Estimation of Ambient Concentrations of Polynuclear Aromatic Hydrocarbons in Soil, Mare Island, Vallejo, California." July 27.

b EPA Region IX 2004 Residential PRGs are used except where alternate criteria are noted.

c Concentrations of metals in soil were compared to the higher of EPA 2004 Region IX residential PRGs or the Mare Island ambient concentration. The Mare Island ambient is defined as the lower of the ambient native soil concentration (95th percentile) or the Mare Island ambient artificial fill concentration (95th percentile) (Tetra Tech 2002b). Concentrations of PAHs in soil were compared to the higher of the EPA 2004 Region IX residential PRGs or the Mare Island ambient concentration (Tetra Tech 1998b).

d Water quality criteria (except TPH) are from "A Compilation of Water Quality Goals" (RWQCB 2000). Specific criterions are:
ß EPA National Ambient Water Quality Criteria for Freshwater Aquatic Life Protection (chronic) (RWQCB 2000)
Γ EPA National Ambient Water Quality Criteria for Saltwater Aquatic Life Protection (chronic) (RWQCB 2000)
δ EPA National Ambient Water Quality Criteria for Freshwater Aquatic Life Protection (acute) (RWQCB 2000)
Ψ EPA National Ambient Water Quality Criteria for Saltwater Aquatic Life Protection (acute) (RWQCB 2000)
Φ California Maximum Contaminant Level (RWQCB 2000)
λ California Ocean Plan Numerical Water Quality Objectives (RWQCB 2000)
* Source: PRC. 1997b. "Draft Final Group II and III Accelerated Study Field Sampling and Analysis Plan, Mare Island, Vallejo, California." August 5.

e The Mare Island groundwater criteria are the higher of the PRG or the most conservative of the ambient values. Analyte concentrations from soil samples collected during the the November 2002 and August 2003 sampling events were compared to this value.

f Lead alternate criteria were calculated using Department of Toxic Substances Control. 1999. "LeadSpread Risk Assessment Spreadsheet, Version 7 for Estimating Blood-Lead Concentrations." March. Available Online at:
http://www.dtsc.ca.gov/ScienceTechnology/ledspred.html

g Source for TPH alternate criteria: PRC. 1997b. "Draft Final Group II and III Accelerated Study Field Sampling and Analysis Plan. Mare Island, Vallejo, California." August 5.

µg/L	Microgram per liter	mg/kg	Milligram per kilogram	RWQCB	Regional Water Quality Control Board
BHC	Benzene hexachloride	NA	No ambient concentration established	SVOC	Semivolatile organic compound
DDD	Dichlorodiphenyldichloroethane	NP	No PRG established	Tetra Tech	Tetra Tech EM Inc.
DDE	Dichlorodiphenyldichloroethene	PAH	Polynuclear aromatic hydrocarbon	TPH	Total petroleum hydrocarbons
DDT	Dichlorodiphenyltrichloroethane	PRC	PRC Environmental Management, Inc.	VOC	Volatile organic compound
EPA	U.S. Environmental Protection Agency	PRG	Preliminary remediation goal		

TABLE 3: SAMPLING LOCATIONS, ANALYSES, AND RATIONALE FOR THE NOVEMBER 2002 SAMPLING EVENT

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Point Identification No.	Sample Identification No.	Matrix	Soil Sample Depth (feet bgs)	Analyses	Rationale
ELEMGB001 through ELEMGB027	179ELEMGP001 through 179ELEMGP054	Soil	0 to 0.5 and 1.5 to 2.0	Metals, hexavalent chromium, VOCs, SVOCs, pesticides, PCBs, TPH-dr, TPH-gr, and TPH-mr	Preliminary investigation of unpaved playground, paved playground, bare ground near Building 864, grassy area between Buildings 864 and 2000, and bare ground area on the west end of Building 2001
23W08	179ELEMWB001	Water	NA	Metals, hexavalent chromium, VOCs, SVOCs, pesticides, PCBs, TPH-dr, TPH-gr, and TPH-mr	Additional groundwater data
23W09	179ELEMWB002	Water	NA	Metals, hexavalent chromium, VOCs, SVOCs, pesticides, PCBs, TPH-dr, TPH-gr, and TPH-mr	Additional groundwater data

Notes:

bgs Below ground surface
NA Not applicable
PCB Polychlorinated biphenyl
SVOC Semivolatile organic compound
TPH-dr Total petroleum hydrocarbons as diesel range
TPH-gr Total petroleum hydrocarbons as gasoline range
TPH-mr Total petroleum hydrocarbons as motor oil range
VOC Volatile organic compound

TABLE 4: STATISTICAL SUMMARY OF THE NOVEMBER 2002 SOIL SAMPLE RESULTS

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Analyte	Number of Detections/ Total Number of Samples	Maximum Detected Concentration (mg/kg)	Average Detected Concentration (mg/kg)	Mare Island Ambient Native Soil[a] (mg/kg)	Number of Samples with Concentrations Exceeding Mare Island Ambient Native Soil	Mare Island Ambient Fill[a] (mg/kg)	Number of Samples with Concentrations Exceeding Mare Island Ambient Fill	Residential PRG or Alternate Criteria[b] (mg/kg)	Number of Samples with Concentrations Exceeding the PRG or Alternate Criteria	Comparison Criteria[c] (mg/kg)	Number of Samples with Concentrations Exceeding Comparison Criteria
Metals											
Aluminum	54/54	33,800	16,900	26,000	2	35,000	0	76,000	0	76,000	0
Antimony	30/30	5.6 J	3.2	1.3	30	8.5	0	31	0	31	0
Arsenic	53/54	11.0 J	5.8	16	0	36	0	0.39	53	16	0
Barium	54/54	431 J	151	NA	NA	NA	NA	5,400	0	5,400	0
Beryllium	52/54	1.1	0.54	1.8	0	0.9	1	150	0	150	0
Cadmium	0/54	ND	ND	3.5	0	5.2	0	37	0	37	0
Calcium	54/54	115,000	9,810	NA	NA	NA	NA	NP	NP	NP	NP
Chromium	54/54	111	33.3	56	2	140	0	210	0	210	0
Chromium VI	0/54	ND	ND	NA	NA	NA	NA	30	0	30	0
Cobalt	54/54	25.5	11.1	NA	NA	NA	NA	900	0	900	0
Copper	54/54	74.8 J	28.2	210	0	120	0	3,100	0	3,100	0
Iron	54/54	45,800	22,700	44,000	1	62,000	0	23,000	21	44,000	1
Lead	53/54	620 J	31.1	33	10	59	2	210[d]	1	210	1
Magnesium	54/54	18,400	5,340	NA	NA	NA	NA	NP	NP	NP	NP
Manganese	54/54	1,390 J	433	560	13	1,600	0	1,800	0	1,800	0
Mercury	29/54	0.78	0.15	NA	NA	2	NA	23	0	23	0
Molybdenum	1/54	0.86 J	0.86	NA	NA	NA	NA	390	0	390	0
Nickel	54/54	136	37.5	70	3	130	1	1,600	0	1,600	0
Selenium	1/54	0.45 J	0.45	NA	NA	NA	NA	390	0	390	0
Silver	0/54	ND	ND	NA	NA	NA	NA	390	0	390	0
Sodium	52/54	3,370 J	470	NA	NA	NA	NA	NP	NP	NP	NP
Thallium	0/54	ND	ND	NA	NA	NA	NA	5.2	0	5.2	0
Vanadium	54/54	141	46.5	130	1	190	0	78	0	130	1
Zinc	54/54	196	68.4	100	7	230	0	23,000	0	23,000	0
Volatile Organic Compounds											
2-Butanone	2/54	0.03	0.02	NA	NA	NA	NA	22,311	0	22,311	0
4-Methyl-2-Pentanone	1/54	0.008 J	0.008	NA	NA	NA	NA	5,281	0	5,281	0
Acetone	23/54	0.4	0.1	NA	NA	NA	NA	14,127	0	14,127	0
Carbon Disulfide	2/54	0.004 J	0.004	NA	NA	NA	NA	360	0	360	0
Toluene	3/54	0.03	0.02	NA	NA	NA	NA	520	0	520	0
Total VOCs	23/54	0.4	0.1	NA	NA	NA	NA	NP	NP	NP	NP
Bis(2-Ethylhexyl)Phthalate	1/54	1	1	NA	NA	NA	NA	35	0	35	0

TABLE 4: STATISTICAL SUMMARY OF THE NOVEMBER 2002 SOIL SAMPLE RESULTS (CONTINUED)
Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Analyte	Number of Detections/ Total Number of Samples	Maximum Detected Concentration (mg/kg)	Average Detected Concentration (mg/kg)	Mare Island Ambient Native Soil[a] (mg/kg)	Number of Samples with Concentrations Exceeding Mare Island Ambient Native Soil	Mare Island Ambient Fill[a] (mg/kg)	Number of Samples with Concentrations Exceeding Mare Island Ambient Fill	Residential PRG or Alternate Criteria[b] (mg/kg)	Number of Samples with Concentrations Exceeding the PRG or Alternate Criteria	Comparison Criteria[c] (mg/kg)	Number of Samples with Concentrations Exceeding Comparison Criteria
Semivolatile Organic Compounds											
Fluoranthene	2/54	0.02 J	0.02	NA	NA	NA	NA	2,300	0	2,300	0
Phenol	8/54	4	2	NA	NA	NA	NA	18,331	0	18,331	0
Pyrene	2/54	0.03 J	0.03	NA	NA	NA	NA	2,300	0	2300	0
Total HMW PAHs	2/54	0.05	0.04	NA	NA	NA	NA	NP	NP	NP	NP
Total PAHs	2/54	0.05	0.04	NA	NA	NA	NA	NP	NP	NP	NP
Total SVOCs	10/54	4	2	NA	NA	NA	NA	NP	NP	NP	NP
Pesticides											
4,4'-DDD	10/54	0.03	0.01	NA	NA	NA	NA	2.4	0	2.4	0
4,4'-DDE	16/54	0.06	0.02	NA	NA	NA	NA	1.7	0	1.7	0
4,4'-DDT	20/54	0.02 J	0.008	NA	NA	NA	NA	1.7	0	1.7	0
Aldrin	3/54	0.005	0.003	NA	NA	NA	NA	0.029	0	0.029	0
Alpha-BHC	4/54	0.01	0.006	NA	NA	NA	NA	0.09	0	0.09	0
Alpha-Chlordane	16/54	0.07 J	0.01	NA	NA	NA	NA	1.6	0	1.6	0
Dieldrin	4/54	0.01	0.006	NA	NA	NA	NA	0.03	0	0.03	0
Endrin	2/54	0.009 J	0.007	NA	NA	NA	NA	18	0	18	0
Gamma-BHC (Lindane)	1/54	0.001 J	0.001	NA	NA	NA	NA	0.44	0	0.44	0
Gamma-chlordane	16/54	0.03	0.007	NA	NA	NA	NA	1.6	0	1.6	0
Heptachlor epoxide	7/54	0.005 J	0.003	NA	NA	NA	NA	0.053	0	0.053	0
Methoxychlor	1/54	0.06 J	0.06	NA	NA	NA	NA	310	0	310	0
Total Chlordanes	21/54	0.1	0.01	NA	NA	NA	NA	NP	NP	NP	NP
Total DDTs	23/54	0.08	0.03	NA	NA	NA	NA	NP	NP	NP	NP
Total Pesticides	31/54	0.2	0.03	NA	NA	NA	NA	NP	NP	NP	NP
PCBS											
Aroclor-1260	3/54	0.05	0.04	NA	NA	NA	NA	0.22	0	0.22	0
Petroleum Indicators											
Diesel Range	5/54	960 HJ	340	NA	NA	NA	NA	400[e]	2	400	2
Gasoline Range	1/47	0.5 J	0.5	NA	NA	NA	NA	150[e]	0	150	0
Motor Oil Range	16/54	810 MJ	130	NA	NA	NA	NA	400[e]	1	400	1
Total TPH	17/54	1,800	220	NA	NA	NA	NA	NP	NP	NP	NP

TABLE 4: STATISTICAL SUMMARY OF THE NOVEMBER 2002 SOIL SAMPLE RESULTS (CONTINUED)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Notes:

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

TPH results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

"R" and "Z" qualified data (rejected results and non-fuel TPH results, respectively) were excluded from the statistical summary.

a	All values are the 95th percentile concentrations. Source for metals: Tetra Tech. 2002b. "Final Compilation of Technical Memoranda on Ambient Analyses of Metals in Soils and Groundwater, Mare Island, Vallejo, California." April 19. Source for PAHs: Tetra Tech. 1998d. "Draft Technical Memorandum Estimation of Ambient Concentrations of Polynuclear Aromatic Hydrocarbons in Soil, Mare Island, Vallejo, California." July 27.
b	All values are EPA Region IX 2004 residential PRGs, except where alternate criteria are noted.
c	The comparison criteria are the higher of EPA Region IX 2004 residential PRGs or alternate criteria and the Mare Island ambient concentration. The Mare Island ambient is defined as the lower of the ambient native soil concentration (95th percentile) or the Mare Island ambient artificial fill concentration (95th percentile) (Tetra Tech 2002b). See Table 1 for the specific criteria selection process and Table 2 for the individual criterion values.
d	Source of lead alternate criteria: Tetra Tech. 2001. "Draft Preliminary Remediation Goals for Lead, Mare Island, Vallejo California." April 30. The Mare Island site-specific lead preliminary remediation goal was calculated using "LeadSpread Risk Assessment Spreadsheet, Version 7 for Estimating Blood-Lead Concentrations" from the Department of Toxic Substances Control, March 1999. .Available Online at: http://www.dtsc.ca.gov/AssessingRisk/leadspread.cfm
e	Source for TPH alternate criteria: PRC Environmental Management, Inc. 1997b. "Draft Final Group II and III Accelerated Study Field Sampling and Analysis Plan, Mare Island, Vallejo, California." August 5.

BHC	Benzene hexachloride (also known as hexachlorocyclohexane)
DDD	Dichlorodiphenyldichloroethane
DDE	Dichlorodiphenyldichloroethene
DDT	Dichlorodiphenyltrichloroethane
EPA	U.S. Environmental Protection Agency
H	Heavier
J	Estimated value
M	Motor oil
mg/kg	Milligrams per kilogram
NA	No ambient value established
ND	Not detected
NP	No PRG established
PAH	Polynuclear aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PRG	Preliminary remediation goal
SVOC	Semivolatile organic compound
Tetra Tech	Tetra Tech EM Inc.
TPH	Total petroleum hydrocarbons
VOC	Volatile organic compound

TABLE 5: STATISTICAL SUMMARY OF THE NOVEMBER 2002 GROUNDWATER SAMPLE RESULTS

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Analyte	Number of Detections/ Total Number of Samples	Maximum Detected Concentration (µg/L)	Average Detected Concentration (µg/L)	Mare Island Ambient Concentration for Groundwater[a] (µg/L)	Number of Samples with Concentrations Exceeding the Mare Island Ambient Concentration	Ambient Water Quality Criterion (µg/L)	Ambient Water Quality Criterion Source[b]	Number of Samples with Concentrations Exceeding AWQC	Mare Island Groundwater Comparison Criteria[c] (µg/L)	Number of Samples with Concentrations Exceeding Comparison Criteria
Metals										
Aluminum	0/2	ND	ND	480	0	87	ß	0	480	0
Antimony	0/2	ND	ND	5.6	0	30	ß	0	30	0
Arsenic	0/2	ND	ND	78	0	36	Γ	0	78	0
Barium	2/2	53.3	52.6	1,200	0	NA	NA	NA	1,200	NA
Beryllium	0/2	ND	ND	1.6	0	5.3	ß	0	5.3	0
Cadmium	0/2	ND	ND	16	0	1	ß	0	16	0
Calcium	2/2	167,000 J	161,000	680,000	0	NA	NA	NA	680,000	NA
Chromium	0/2	ND	ND	22	0	74	ß	0	74	0
Chromium VI	2/2	1.4	1	NA	NA	11	ß	0	11	0
Cobalt	0/2	ND	ND	100	0	NA	NA	NA	100	NA
Copper	0/2	ND	ND	33	0	3.1	Γ	0	33	0
Iron	0/2	ND	ND	140,000	0	1,000	ß	0	140,000	0
Lead	0/2	ND	ND	10	0	2.5	ß	0	10	0
Magnesium	2/2	30,500	28,700	1,500,000	0	NA	NA	NA	1,500,000	NA
Manganese	0/2	ND	ND	5,400	0	NA	NA	NA	5,400	NA
Mercury	0/2	ND	ND	0.22	0	0.025	Γ	0	0.22	0
Molybdenum	0/2	ND	ND	8.8	0	NA	NA	NA	8.8	NA
Nickel	0/2	ND	ND	7.5	0	8.2	Γ	0	8.2	0
Selenium	0/2	ND	ND	12	0	5	ß	0	12	0
Silver	0/2	ND	ND	15	0	0.19	ß	0	15	0
Sodium	2/2	441,000	365,000	7,400,000	0	NA	NA	NA	7,400,000	NA
Thallium	0/2	ND	ND	NA	NA	40	ß	0	40	0
Vanadium	0/2	ND	ND	140	0	NA	NA	NA	140	NA
Zinc	0/2	ND	ND	260	0	81	Γ	0	260	0
Volatile Organic Compounds										
Benzene	1/2	0.4 J	0.4	NA	NA	510	Ψ	0	510	0
Toluene	1/2	0.5 J	0.5	NA	NA	5,000	Γ	0	5,000	0
Total BTEX	1/2	0.8	0.8	NA	NA	NA	NA	NA	NA	NA
Total VOCs	1/2	0.8	0.8	NA	NA	NA	NA	NA	NA	NA
Pesticides										
Heptachlor epoxide	1/2	0.04 J	0.04	NA	NA	0.0036	Γ	1	0.0036	1

TABLE 5: STATISTICAL SUMMARY OF THE NOVEMBER 2002 GROUNDWATER SAMPLE RESULTS (CONTINUED)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Notes:

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.
Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

a	Values are the 95th percentile concentrations. Source: Tetra Tech. 2002b. "Final Compilation of Technical Memoranda on Ambient Analyses of Metals in Soils and Groundwater, Mare Island, Vallejo, California." April 19.
b	Water quality criteria are from "A Compilation of Water Quality Goals" (RWQCB 2000). Specific criterions are as follows: ß EPA National Ambient Water Quality Criteria for Freshwater Aquatic Life Protection (chronic) (RWQCB 2000) Γ EPA National Ambient Water Quality Criteria for Saltwater Aquatic Life Protection (chronic) (RWQCB 2000) Ψ EPA National Ambient Water Quality Criteria for Saltwater Aquatic Life Protection (acute) (RWQCB 2000)
c	The Mare Island groundwater comparison criterion for each analyte is the higher of the Mare Island groundwater ambient (95th Percentile) (Tetra Tech 2002b) or the AWQC (RWQCB 2000). See Table 1 for the criteria selection process and Table 2 for individual criterion values.

µg/L	Microgram per liter
AWQC	Ambient water quality criterion
BTEX	Benzene, toluene, ethylbenzene, and xylenes (total)
EPA	U.S. Environmental Protection Agency
J	Estimated value
NA	Not available
ND	Not detected
RWQCB	California Regional Water Quality Control Board
Tetra Tech	Tetra Tech EM Inc.
VOC	Volatile organic compound

TABLE 6: SAMPLING LOCATIONS, ANALYSES, AND RATIONALE FOR THE AUGUST 2003 SAMPLING EVENT

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Point Identification No.	Sample Identification No.	Matrix	Soil Sample Depth (feet bgs)	Analyses	Rationale
ELEMGB028 through ELEMGB035	ELEMGP058 through ELEMGP082	Soil	Three depths from 0 to 25[a]	PAHs, TPH-dr, and TPH-mr	Located near previous sampling locations where concentrations of TPH equaled or exceeded 1,000 milligrams per kilogram
ELEMGB028 through ELEMGB035	ELEMGP083 through ELEMGP091	Water	Not applicable	TPH-dr, TPH-gr, and TPH-mr	Located near previous sampling locations where concentrations of TPH equaled or exceeded 1,000 milligrams per kilogram

Notes:

a Soil sample depths were selected based on the three highest PID readings and/or other evidence of petroleum product (i.e. staining). The sample with the highest PID reading of the three samples collected at each location was also analyzed for PAHs.

bgs Below ground surface
PAH Polynuclear aromatic hydrocarbon
PID Photoionization detector
TPH-dr Total petroleum hydrocarbons as diesel range
TPH-gr Total petroleum hydrocarbons as gasoline range
TPH-mr Total petroleum hydrocarbons as motor oil range

TABLE 7: STATISTICAL SUMMARY OF THE AUGUST 2003 SOIL SAMPLE RESULTS

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Analyte	Number of Detections/ Total Number of Samples	Maximum Detected Concentration (mg/kg)	Average Detected Concentration (mg/kg)	Number of Samples with Concentrations Exceeding Alternative Criteria [a] (mg/kg)	Number of Samples with Concentrations Exceeding Alternative Criteria and the 95th Ambient Value	Number of Discrete Locations with Sample Concentrations Exceeding Alternative Criteria and the 95th Ambient Value	Number of Samples with Concentrations Exceeding Alternative Criteria and the 99th Ambient Value	Number of Discrete Locations with Sample Concentrations Exceeding Alternative Criteria and the 99th Ambient Value	Comparison Criteria		
									Alternative Value[a] (mg/kg)	95th Ambient Value (mg/kg)	99th Ambient Value (mg/kg)
Petroleum Indicators											
Diesel Range	4/24	880 DJ	240	1	NA	NA	NA	NA	400	NA	NA

Notes:

TPH results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

"R" and "Z" qualified data (rejected results and non-fuel TPH results, respectively) were excluded from the statistical summary.

a Source for TPH alternate criteria: PRC Environmental Management, Inc. 1997b. "Draft Final Group II and III Accelerated Study Field Sampling and Analysis Plan, Mare Island, Vallejo, California." August 5.

D Patter resembles diesel
J Estimated concentration
mg/kg Milligram per kilogram
NA No ambient value has been established
TPH Total petroleum hydrocarbons

TABLE 8: STATISTICAL SUMMARY OF THE AUGUST 2003 GROUNDWATER SAMPLE RESULTS

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Analyte	Number of Detections/ Total Number of Samples	Maximum Detected Concentration (mg/L)	Average Detected Concentration (mg/L)	Number of Locations where Samples had Detectable Concentrations	Number of Samples with Concentrations Exceeding the Human Health Ingestion Criterion	Human Health Ingestion Criterion (mg/L)	Number of Samples with Concentrations Exceeding the Groundwater Comparison Criterion	Mare Island Groundwater Comparison Criterion[a] (mg/L)	Number of Samples with Concentrations Exceeding Environmental Screening Levels	Environmental Screening Levels[b]
Petroleum Indicators										
Diesel Range	2/8	0.32 D	0.19	2	NA	NA	0	1.4	1 1 0	0.10[c] 0.21[d] 0.64[e]
Motor Oil Range	7/8	3 M	0.7	7	NA	NA	1	1.4	7 5 1	0.10[c] 0.21[d] 0.64[e]

Notes:

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

a Source for TPH alternate criteria: PRC Environmental Management, Inc. 1997b. "Draft Final Group II and III Accelerated Study Field Sampling and Analysis Plan, Mare Island, Vallejo, California." August 5.
b Source for environmental screening levels: California Regional Water Quality Control Board. 2005. "Screening For Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final." February.
c Final environmental screening level based on ceiling value from Table F-1A, Groundwater Screening Levels, when groundwater is a current or potential drinking water resource
d Environmental screening level based on drinking water toxicity value from Table F-1A, Groundwater Screening Levels, when groundwater is a current or potential drinking water resource
e Final environmental screening level based on from Table F-1B, Groundwater Screening Levels, when groundwater is not a current or potential drinking water resource

D Pattern resembles diesel
M Pattern resembles motor oil
mg/L Milligram per liter
NA No water quality criterion available

APPENDIX A
ANALYTICAL RESULTS FROM PREVIOUS INVESTIGATIONS

2 pages.

TABLE A-1: STATISTICAL SUMMARY OF SOIL SAMPLE RESULTS FROM PREVIOUS INVESTIGATIONS[a]
Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Analyte	Number of Detections/Total Number of Samples	Maximum Detected Concentration (mg/kg)	Average Detected Concentration (mg/kg)	Mare Island Ambient Fill[b] (mg/kg)	Number of Samples with Concentrations Exceeding Mare Island Ambient Value	Residential PRG or Alternate Criteria[c] (mg/kg)	Number of Samples with Concentrations Exceeding PRG or Alternate Criteria	Comparison Criteria for Mare Island Soil[d]	Number of Samples with Concentrations Exceeding Comparison Criteria for Mare Island Soil
Metals									
Aluminum	4/4	16,600	12,100	35,000	0	76,000	0	76,000	0
Antimony	1/4	0.46 J	0.46	8.5	0	31	0	31	0
Arsenic	4/4	17.4	9.9	36	0	36	4	36	0
Barium	4/4	228	165	NA	0	5,400	0	5,400	0
Beryllium	3/4	0.76	0.56	0.9	0	150	0	150	0
Cadmium	3/6	3.5	2.2	5.2	0	1.7	1	5	0
Calcium	6/6	234,000 J	101,000	NA	NA	NP	NP	NP	NA
Chromium	6/6	58.9 J	35.4	140	0	210	0	210	0
Chromium VI	0/3	ND	ND	NA	0	30	0	30	0
Cobalt	4/6	10.7	8.4	NA	0	900	0	900	0
Copper	5/6	50.4 J	32.6	120	0	3,100	0	3,100	0
Iron	6/6	36,800	25,200	62,000	0	23,000	3	62,000	0
Lead	6/6	11.7 J	8.5	59	0	210[e]	0	210	0
Magnesium	4/4	8,360	6,050	NA	NA	NP	NP	NP	NA
Manganese	6/6	608	306	1,600	0	1,800	0	1,800	0
Mercury	1/4	0.09	0.09	2	0	23	0	23	0
Molybdenum	0/6	ND	ND	NA	0	390	0	390	0
Nickel	6/6	53.9	35.1	130	0	1,600	0	1,600	0
Potassium	6/6	20,200 J	6,620	NA	NA	NP	NP	NP	NA
Selenium	0/4	ND	ND	NA	0	390	0	390	0
Silver	0/4	ND	ND	NA	0	390	0	390	0
Sodium	2/4	1,250	807	NA	NA	NP	NP	NP	NA
Thallium	0/4	ND	ND	NA	0	5.2	0	5.2	0
Tin	3/3	16.6	14.4	NA	0	47,000	0	47,000	0
Titanium	3/3	3,830	2,970	NA	NA	NP	NP	NP	NA
Vanadium	6/6	102 J	50.4	190	0	550	0	550	0
Zinc	6/6	123	66.5	230	0	23,000	0	23,000	0
Petroleum Indicators									
Diesel Range	20/144	8,400	710	NA	6	400[f]	6		6
Gasoline Range	1/144	27	27	NA	0	150[f]	0		0
Motor Oil Range	3/143	180	150	NA	0	400[f]	0		0

TABLE A-1: STATISTICAL SUMMARY OF SOIL SAMPLE RESULTS FROM PREVIOUS INVESTIGATIONS[a] (CONTINUED)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Notes:

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

TPH results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

"R" and "Z" qualified data (rejected results and non-fuel TPH results, respectively) were excluded from the statistical summary.

a	Summary data included in this table are from soil samples collected at the Mare Island Elementary School site during the phase II RI for IR Site 23 (PRC 1997a). Results from soil samples collected during the RI for IR Site 23 from locations outside the school site were excluded from this summary table. Table F-1 in Appendix F of the SAP for the Mare Island Elementary School presents the complete analytical results for soil samples collected from the school site during previous investigations, and include the results for data presented in this summary table (Tetra Tech 2002c).
b	All values are the 95th percentile concentrations. Ambient metal concentrations cited from “Final Compilation of Technical Memoranda on Ambient Analyses of Metals in Soils and Groundwater, Mare Island, California” (Tetra Tech 2002b).
c	All values are EPA Region IX 2004 residential PRGs (EPA 2004), except where alternate criteria are noted.
d	The comparison criteria is the higher of EPA Region IX 2002 residential PRGs or alternate criteria and the Mare Island ambient concentration. The Mare Island ambient value is defined as the lower of the ambient native soil concentration (95th percentile) or the Mare Island ambient artificial fill concentration (95th percentile) (Tetra Tech 2002b). See Table 1 for the selection process for specific criteria, and Table 2 for the individual criterion values.
e	Lead alternate criteria calculated using LeadSpread 7.0 model (DTSC 1999). Lead alternate cited from the “Draft Preliminary Remediation Goals for Lead, Mare Island, Vallejo California” (Tetra Tech 2001).
f	Alternate criteria for TPH cited from the "Draft Final Group II and III Accelerated Study Field Sampling and Analysis Plan, Mare Island, Vallejo, California" (PRC 1997b).

DTSC	Department of Toxic Substances Control
EPA	U.S. Environmental Protection Agency
IR	Installation restoration
J	Estimated value
mg/kg	Milligram per kilogram
NA	No ambient concentration established
ND	Not detected
NP	No PRG established
PRC	PRC Environmental Management, Inc.
PRG	Preliminary remediation goal
RI	Remedial investigation
Tetra Tech	Tetra Tech EM Inc.
TPH	Total petroleum hydrocarbons

Sources:

DTSC. 1999. LeadSpread Risk Assessment Spreadsheet, Version 7 for Estimating Blood-Lead Concentrations. March. Available Online at: http://www.dtsc.ca.gov/AssessingRisk/leadspread.cfm

EPA. 2004. “Region 9 PRG Table.” Available online at: http://www.epa.gov/region09/waste/sfund/prg/files/04prgtable.pdf

PRC. 1997a. “Draft Final Remedial Investigation Report, Operable Unit 2, Mare Island, Vallejo, California.” January 31.

PRC. 1997b. "Draft Final Group II and III Accelerated Study Field Sampling and Analysis Plan, Mare Island, Vallejo, California." August 5.

Tetra Tech. 2001. “Draft Preliminary Remediation Goals for Lead, Mare Island, Vallejo, California.” April 30.

Tetra Tech. 2002b. “Final Compilation of Technical Memoranda on Ambient Analyses of Metals in Soils and Groundwater, Mare Island, California.” April 19.

Tetra Tech. 2002c. “Draft Final Sampling and Analysis Plan for Soil and Groundwater Sampling at the Mare Island Elementary School Site.” December 31.

TABLE A-2: SUMMARY OF GROUNDWATER SAMPLE RESULTS FROM PREVIOUS INVESTIGATIONS[a]

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Analyte	Number of Detections/ Total Number of Samples	Maximum Detected Concentration	Average Detected Concentration	Mare Island Ambient Value for Groundwater[b]	Number of Samples with Concentrations Exceeding the Mare Island Ambient Value	Ambient Water Quality Criterion	Ambient Water Quality Criterion Source[c]	Number of Samples with Concentrations Exceeding the Ambient Water Quality Criterion	Mare Island Groundwater Comparison Criteria	Number of Samples with Concentrations Exceeding Mare Island Groundwater Comparison Criteria
Metals (µg/L)										
Aluminum	0/12	ND	ND	480	0	87	ß	0	480	0
Antimony	1/12	2.4 J	2.4	5.6	0	30	ß	0	30	0
Arsenic	7/12	3.9 J	2.7	78	0	36	Γ	0	78	0
Barium	10/12	46.3	34.8	1,200	0	NA	NA	NA	1,200	0
Beryllium	0/12	ND	ND	1.6	0	5.3	ß	0	5.3	0
Cadmium	0/12	ND	ND	16	0	1	ß	0	16	0
Calcium	12/12	206,000	125,000	680,000	0	NA	NA	NA	680,000	0
Chromium	7/12	5.0 J	2.9	22	0	74	ß	0	74	0
Chromium VI	0/4	ND	ND	NA	NA	11	ß	0	NA	NA
Cobalt	6/12	2.4 J	2.1	100	0	NA	NA	NA	100	0
Copper	0/12	ND	ND	33	0	3.1	Γ	0	33	0
Iron	0/12	ND	ND	140,000	0	1,000	ß	0	140,000	0
Lead	1/12	6.7	6.7	10	0	2.5	ß	1	10	0
Magnesium	12/12	44,600	24,600	1,500,000	0	NA	NA	NA	1,500,000	0
Manganese	6/12	9.0 J	7.3	5,400	0	NA	NA	NA	5,400	0
Mercury	2/12	0.11 J	0.1	0.22	0	0.025	Γ	2	0.22	0
Molybdenum	10/12	8.3	5.4	8.8	0	NA	NA	NA	8.8	0
Nickel	6/12	2.6 J	1.7	7.5	0	8.2	Γ	0	8.2	0
Potassium	12/12	10,900 J	5,650	210,000	0	NA	NA	NA	210,000	0
Selenium	3/12	6.8	3.8	12	0	5	ß	1	12	0
Silver	0/12	ND	ND	15	0	0.19	ß	0	15	0
Sodium	12/12	364,000	296,000	7,400,000	0	NA	NA	NA	7,400,000	0
Thallium	0/12	ND	ND	NA	NA	40	ß	0	40	0
Vanadium	3/12	2.5 J	1.9	140	0	NA	NA	NA	140	0
Zinc	5/12	8 J	5	260	0	81	Γ	0	260	0
Volatile Organic Compounds (µg/L)										
Toluene	1/12	2	2	NA	NA	5,000	Γ	0	5,000	0
Total BTEX	1/12	2	2	NA	NA	NA	NA	NA	NA	NA
Total VOCs	1/12	2	2	NA	NA	NA	NA	NA	NA	NA

TABLE A-2: SUMMARY OF GROUNDWATER SAMPLE RESULTS FROM PREVIOUS INVESTIGATIONS[a] (CONTINUED)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Analyte	Number of Detections/ Total Number of Samples	Maximum Detected Concentration	Average Detected Concentration	Mare Island Ambient Value for Groundwater[b]	Number of Samples with Concentrations Exceeding the Mare Island Ambient Value	Ambient Water Quality Criterion	Ambient Water Quality Criterion Source[c]	Number of Samples with Concentrations Exceeding the Ambient Water Quality Criterion	Mare Island Groundwater Comparison Criteria	Number of Samples with Concentrations Exceeding Mare Island Groundwater Comparison Criteria
Semivolatile Organic Compounds (µg/L)										
2,6-Dinitrotoluene	1/10	1 J	1	NA	NA	230	ß	0	NA	0
Pesticides/PCBs(µg/L)										
Heptachlor epoxide	3/10	0.08	0.05	NA	NA	0.0036	Γ	3	NA	3
Petroleum Indicators (mg/L)										
TPH-dr/mr	4/14	1	0.47	NA	NA	1.4	*	0	NA	0
TPH-gr	1/14	0.03	0.03	NA	NA	1.4	*	0	NA	0
Anions (mg/L)										
Chloride	10/10	223	183	NA	NA	230	ß	10	NA	10
Nitrate (as N)	10/10	42	21.8	NA	NA	NA	NA	NA	NA	NA
Ortho-Phosphate (as P)	2/2	0.32 J	0.32	NA	NA	NA	NA	NA	NA	NA
Phosphate	2/8	0.11 J	0.11	NA	NA	NA	NA	NA	NA	NA
Sulfate	10/10	245	189	NA	NA	NA	NA	NA	NA	NA
Total Dissolved Solids	12/12	1,700	1,300	NA	NA	NA	NA	NA	NA	NA

Notes:
Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.
Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.
TPH results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

a Samples included in this table were collected at the Mare Island Elementary School site during the phase II RI (PRC Environmental Management, Inc. 1997a) and during quarterly monitoring (Tetra Tech 1998a, 1998d, 1998e, 1999, 2000).
b Values are the 95th Percentile concentrations. Ambient concentrations cited from the "Final Compilation of Technical Memoranda on Ambient Analyses of Metals in Soils and Groundwater, Mare Island, California." (Tetra Tech 2002b).
c Ambient water quality criteria (except TPH) are from "A Compilation of Water Quality Goals" (RWQCB 2000). Specific criterions are as follows:
ß EPA National Ambient Water Quality Criteria for Freshwater Aquatic Life Protection (chronic) (RWQCB 2000)
Γ EPA National Ambient Water Quality Criteria for Saltwater Aquatic Life Protection (chronic) (RWQCB 2000)
* TPH alternate criteria (PRC Environmental Management, Inc. 1997b)

µg/L	Microgram per liter	NA	No ambient value established	Tetra Tech	Tetra Tech EM Inc.
BTEX	Benzene, toluene, ethylbenzene, and xylenes (total)	ND	Not detected	TPH	Total petroleum hydrocarbons
EPA	U.S. Environmental Protection Agency	PCB	Polychlorinated biphenyl	TPH-dr/mr	Sum of total petroleum hydrocarbons in the diesel and motor oil ranges and other ("Y"-qualified) extractable fuels
J	Estimated value	RI	Remedial investigation	TPH-gr	Sum of total petroleum hydrocarbons in the gasoline range and other ("Y"-qualified) purgeable fuels
mg/L	Milligram per liter	RWQCB	Regional Water Quality Control Board	VOC	Volatile organic compound

Sources:
PRC Environmental Management, Inc. 1997a. "Draft Final Remedial Investigation Report, Operable Unit 2, Mare Island, Vallejo, California." January 31.
PRC Environmental Management, Inc.. 1997b. "Draft Final Group II and III Accelerated Study Field Sampling and Analysis Plan, Mare Island, Vallejo, California." August 5.
RWQCB. 2000. "A Compilation of Water Quality Goals." Staff Report. Prepared by Marshack, J.B. Central Valley Region. Sacramento, California.
Tetra Tech. 1998a. "Basewide Polychlorinated Biphenyl Confirmation Sampling Summary Report, Mare Island, Vallejo, California." February 13.
Tetra Tech. 1998d. "Draft Technical Memorandum Estimation of Ambient Concentrations of Polynuclear Aromatic Hydrocarbons in Soil, Mare Island, Vallejo, California." July 27.
Tetra Tech. 1998e. "May/June 1998 Phase II Quarterly Groundwater Sampling Report, Mare Island, Vallejo, California." October 5.
Tetra Tech. 1999. "August 1998 Phase II Quarterly Groundwater Sampling and Annual Summary Report, Mare Island, Vallejo, California." January 1.
Tetra Tech. 2000. "June/July 1999 Interim Facility-wide Groundwater Monitoring Program Quarterly Report, Mare Island, Vallejo, California." March 20.
Tetra Tech. 2002b. "Final Compilation of Technical Memoranda on Ambient Analyses of Metals in Soils and Groundwater, Mare Island, California." April 19.

TABLE A-3: STATISTICAL SUMMARY OF SOIL SAMPLE RESULTS FROM THE FOSTER WHEELER INVESTIGATION[a]

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Analyte	Number of Detections/Total Number of Samples	Maximum Detected Concentration (mg/kg)	Average Detected Concentration (mg/kg)	Mare Island Ambient Fill[b] (mg/kg)	Soil Comparison Criteria[c] (mg/kg)	Number of Samples with Concentrations Greater than Comparison Criteria
Metals						
Antimony	1/4	6.4	6.4	8.5	8.5	0
Arsenic	2/4	4.3	4.2	36	36	0
Barium	4/4	161	92	NA	NA	NA
Beryllium	3/4	0.3	0.15	0.9	0.9	0
Cadmium	2/4	0.19	0.18	5.2	5.2	0
Chromium	4/4	2,660	685	140	140	1
Cobalt	4/4	42.8	16.2	NA	NA	NA
Copper	4/4	1,130	296	120	120	1
Lead	4/4	370	97.7	59	59	1
Mercury	1/4	0.13 J	0.13	2	2	0
Molybdenum	1/4	12.3	12.3	NA	NA	NA
Nickel	4/4	1,220	328	130	130	1
Selenium	0/4	ND	ND	NA	NA	NA
Silver	0/4	ND	ND	NA	NA	NA
Thallium	1/4	0.41J	0.41	NA	NA	NA
Vanadium	4/4	37	34.6	190	190	0
Zinc	4/4	195	81.6	230	230	0
Volatile Organic Compounds						
Acetone	1/3	27 J	27	NA	NA	NA
Benzene	0/3	ND	ND	NA	NA	NA
Bromodichloromethane	0/3	ND	ND	NA	NA	NA
Bromoform	0/3	ND	ND	NA	NA	NA
Bromomethane	0/3	ND	ND	NA	NA	NA
2-Butanone (MEK)	0/3	ND	ND	NA	NA	NA
Carbon tetrachloride	0/3	ND	ND	NA	NA	NA
Chlorobenzene	0/3	ND	ND	NA	NA	NA
Chlorodibromomethane	0/3	ND	ND	NA	NA	NA
Chloroethane	0/3	ND	ND	NA	NA	NA
Chloroform	0/3	ND	ND	NA	NA	NA
Chloromethane	0/3	ND	ND	NA	NA	NA
1,1-Dichloroethane	0/3	ND	ND	NA	NA	NA

TABLE A-3: STATISTICAL SUMMARY OF SOIL SAMPLE RESULTS FROM THE FOSTER WHEELER INVESTIGATION[a] (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Analyte	Number of Detections/Total Number of Samples	Maximum Detected Concentration (mg/kg)	Average Detected Concentration (mg/kg)	Mare Island Ambient Fill[b] (mg/kg)	Soil Comparison Criteria[c] (mg/kg)	Number of Samples with Concentrations Greater than Comparison Criteria
Volatile Organic Compounds (Continued)						
1,2-Dichloroethane	0/3	ND	ND	NA	NA	NA
1,1-Dichloroethene	0/3	ND	ND	NA	NA	NA
cis-1,2-Dichloroethene	0/3	ND	ND	NA	NA	NA
trans-1,2-Dichloroethene	0/3	ND	ND	NA	NA	NA
1,2-Dichloropropane	0/3	ND	ND	NA	NA	NA
cis-1,3-Dichloropropene	0/3	ND	ND	NA	NA	NA
trans-1,3-Dichloropropene	0/3	ND	ND	NA	NA	NA
Ethylbenzene	0/3	ND	ND	NA	NA	NA
2-Hexanone	0/3	ND	ND	NA	NA	NA
Methylene Chloride	3/3	3 J	2	NA	NA	NA
4-Methyl-2-Pentanone (MIBK)	0/3	ND	ND	NA	NA	NA
Methyl-t-Butyl Ether (MTBE)	0/3	ND	ND	NA	NA	NA
Styrene	0/3	ND	ND	NA	NA	NA
1,1,2,2-Tetrachloroethane	0/3	ND	ND	NA	NA	NA
Tetrachloroethene	0/3	ND	ND	NA	NA	NA
Toluene	0/3	ND	ND	NA	NA	NA
1,1,1-Trichloroethane	0/3	ND	ND	NA	NA	NA
1,1,2-Trichloroethane	0/3	ND	ND	NA	NA	NA
Trichloroethene	0/3	ND	ND	NA	NA	NA
Vinyl Acetate	0/3	ND	ND	NA	NA	NA
Vinyl chloride	0/3	ND	ND	NA	NA	NA
Xylenes (total)	0/3	ND	ND	NA	NA	NA
Semivolatile Organic Compounds						
T-Butyl Alcohol (TBA)	0/3	ND	ND	NA	NA	NA
Diisopropyl Ether (DIPE)	0/3	ND	ND	NA	NA	NA
Ethyl-T-Butyl Ether (ETBE)	0/3	ND	ND	NA	NA	NA
T-Amyl Methyl Ether (TAME)	0/3	ND	ND	NA	NA	NA
Acenaphthene	0/3	ND	ND	NA	NA	NA
Acenaphthylene	0/3	ND	ND	NA	NA	NA
Anthracene	0/3	ND	ND	NA	NA	NA
Benz(a)anthracene	0/3	ND	ND	NA	NA	NA

TABLE A-3: STATISTICAL SUMMARY OF SOIL SAMPLE RESULTS FROM THE FOSTER WHEELER INVESTIGATION[a] (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Analyte	Number of Detections/Total Number of Samples	Maximum Detected Concentration (mg/kg)	Average Detected Concentration (mg/kg)	Mare Island Ambient Fill[b] (mg/kg)	Soil Comparison Criteria[c] (mg/kg)	Number of Samples with Concentrations Greater than Comparison Criteria
Semivolatile Organic Compounds (Continued)						
Benzo(a)pyrene	0/3	ND	ND	NA	NA	NA
Benzo(b)fluoranthene	0/3	ND	ND	NA	NA	NA
Benzo(g,h,i)perylene	0/3	ND	ND	NA	NA	NA
Benzo(k)fluoranthene	0/3	ND	ND	NA	NA	NA
Bis(2-chloroethoxy)methane	0/3	ND	ND	NA	NA	NA
Bis(2-chloroethyl)ether	0/3	ND	ND	NA	NA	NA
Bis(2-chloroisopropyl)ether	0/3	ND	ND	NA	NA	NA
Bis(2-ethylhexyl)phthalate	0/3	ND	ND	NA	NA	NA
4-Bromophenyl phenyl ether	0/3	ND	ND	NA	NA	NA
Butylbenzylphthalate (BBP)	0/3	ND	ND	NA	NA	NA
4-Chloro-3-methylphenol	0/3	ND	ND	NA	NA	NA
4-Chloroaniline	0/3	ND	ND	NA	NA	NA
2-Chloronaphthalene	0/3	ND	ND	NA	NA	NA
2-Chlorophenol	0/3	ND	ND	NA	NA	NA
4-Chlorophenyl phenylether	0/3	ND	ND	NA	NA	NA
Chrysene	0/3	ND	ND	NA	NA	NA
Di-n-butylphthalate (DBP)	0/3	ND	ND	NA	NA	NA
Di-n-octylphthalate (DOP)	0/3	ND	ND	NA	NA	NA
Dibenz(a,h)anthracene	0/3	ND	ND	NA	NA	NA
Dibenzofuran	0/3	ND	ND	NA	NA	NA
1,2-Dichlorobenzene	0/3	ND	ND	NA	NA	NA
1,3-Dichlorobenzene	0/3	ND	ND	NA	NA	NA
1,4-Dichlorobenzene	0/3	ND	ND	NA	NA	NA
3,3'-Dichlorobenzidine	0/3	ND	ND	NA	NA	NA
2,4-Dichlorophenol	0/3	ND	ND	NA	NA	NA
Diethylphthalate (DEP)	0/3	ND	ND	NA	NA	NA
Dimethylphthalate (DMP)	0/3	ND	ND	NA	NA	NA
2,4-Dimethylphenol	0/3	ND	ND	NA	NA	NA
4,6-Dinitro-2-Methylphenol	0/3	ND	ND	NA	NA	NA
2,4-Dinitrophenol	0/3	ND	ND	NA	NA	NA
2,4-Dinitrotoluene	0/3	ND	ND	NA	NA	NA

TABLE A-3: STATISTICAL SUMMARY OF SOIL SAMPLE RESULTS FROM THE FOSTER WHEELER INVESTIGATION[a] (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Analyte	Number of Detections/Total Number of Samples	Maximum Detected Concentration (mg/kg)	Average Detected Concentration (mg/kg)	Mare Island Ambient Fill[b] (mg/kg)	Soil Comparison Criteria[c] (mg/kg)	Number of Samples with Concentrations Greater than Comparison Criteria
Semivolatile Organic Compounds (Continued)						
2,6-Dinitrotoluene	0/3	ND	ND	NA	NA	NA
Fluoranthene	0/3	ND	ND	NA	NA	NA
Fluorene	0/3	ND	ND	NA	NA	NA
Hexachlorobenzene	0/3	ND	ND	NA	NA	NA
Hexachlorobutadiene	0/3	ND	ND	NA	NA	NA
Hexachlorocyclopentadiene	0/3	ND	ND	NA	NA	NA
Hexachloroethane	0/3	ND	ND	NA	NA	NA
Indeno(1,2,3-cd)pyrene	0/3	ND	ND	NA	NA	NA
3/4-Methylphenol (m/p-Cresol)	0/3	ND	ND	NA	NA	NA
2-Methylphenol (o-Cresol)	0/3	ND	ND	NA	NA	NA
Naphthalene	0/3	ND	ND	NA	NA	NA
2-Nitroaniline	0/3	ND	ND	NA	NA	NA
3-Nitroaniline	0/3	ND	ND	NA	NA	NA
4-Nitroaniline	0/3	ND	ND	NA	NA	NA
Nitrobenzene	0/3	ND	ND	NA	NA	NA
2-Nitrophenol	0/3	ND	ND	NA	NA	NA
4-Nitrophenol	0/3	ND	ND	NA	NA	NA
N-Nitroso-di-n-propylamine	0/3	ND	ND	NA	NA	NA
N-Nitrosodiphenylamine	0/3	ND	ND	NA	NA	NA
Pentachlorophenol (PCP)	0/3	ND	ND	NA	NA	NA
Phenanthrene	0/3	ND	ND	NA	NA	NA
Phenol	1/3	170 J	170	NA	NA	NA
Pyrene	0/3	ND	ND	NA	NA	NA
1,2,4-Trichlorobenzene	0/3	ND	ND	NA	NA	NA
2,4,5-Trichlorophenol	0/3	ND	ND	NA	NA	NA
2,4,6-Trichlorophenol	0/3	ND	ND	NA	NA	NA
Pesticides						
Aldrin	0/3	ND	ND	NA	NA	NA
beta-BHC	0/3	ND	ND	NA	NA	NA
alpha-BHC	0/3	ND	ND	NA	NA	NA
delta-BHC	0/3	ND	ND	NA	NA	NA

TABLE A-3: STATISTICAL SUMMARY OF SOIL SAMPLE RESULTS FROM THE FOSTER WHEELER INVESTIGATION[a] (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Analyte	Number of Detections/Total Number of Samples	Maximum Detected Concentration (mg/kg)	Average Detected Concentration (mg/kg)	Mare Island Ambient Fill[b] (mg/kg)	Soil Comparison Criteria[c] (mg/kg)	Number of Samples with Concentrations Greater than Comparison Criteria
Pesticides (Continued)						
gamma-BHC (Lindane)	0/3	ND	ND	NA	NA	NA
alpha-Chlordane	0/3	ND	ND	NA	NA	NA
gamma-Chlordane	0/3	ND	ND	NA	NA	NA
4,4'-DDD	0/3	ND	ND	NA	NA	NA
4,4'-DDE	0/3	ND	ND	NA	NA	NA
4,4'-DDT	0/3	ND	ND	NA	NA	NA
Dieldrin	0/3	ND	ND	NA	NA	NA
Endosulfan I	0/3	ND	ND	NA	NA	NA
Endosulfan II	0/3	ND	ND	NA	NA	NA
Endosulfan sulfate	0/3	ND	ND	NA	NA	NA
Endrin	0/3	ND	ND	NA	NA	NA
Endrin aldehyde	0/3	ND	ND	NA	NA	NA
Endrin ketone	0/3	ND	ND	NA	NA	NA
Heptachlor	0/3	ND	ND	NA	NA	NA
Heptachlor epoxide	0/3	ND	ND	NA	NA	NA
Methoxychlor	0/3	ND	ND	NA	NA	NA
Toxaphene	0/3	ND	ND	NA	NA	NA
PCBs						
Aroclor-1016	0/3	ND	ND	NA	NA	NA
Aroclor-1221	0/3	ND	ND	NA	NA	NA
Aroclor-1232	0/3	ND	ND	NA	NA	NA
Aroclor-1242	0/3	ND	ND	NA	NA	NA
Aroclor-1248	0/3	ND	ND	NA	NA	NA
Aroclor-1254	0/3	ND	ND	NA	NA	NA
Aroclor-1260	1/3	ND	ND	NA	NA	NA
Petroleum Indicators						
Diesel Range	4/39	510	198	NA	400	1
Motor Oil Range	22/39	1,500	226	NA	400	4

TABLE A-3: STATISTICAL SUMMARY OF SOIL SAMPLE RESULTS FROM THE FOSTER WHEELER INVESTIGATION[a] (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Notes:	Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures. Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.
a	Results are from: Foster Wheeler. 2002. "Final Closure Report. Underground Fuel Oil Piping and TPH Contaminated Soil Removal, Mare Island Elementary School." September 17.
b	Values are the Mare Island ambient fill (95th percentile) from the "Final Compilation of Technical Memoranda on Ambient Analyses of Metals in Soils and Groundwater, Mare Island, California" (Tetra Tech 2002b).
c	Comparison criteria for metals is the Mare Island ambient fill values (Tetra Tech 2002b). Source for TPH alternate criteria: PRC Environmental Management, Inc. 1997b. "Draft Final Group II and III Accelerated Study Field Sampling and Analysis Plan, Mare Island, Vallejo, California." August 5.
BHC	Benzene hexachloride (also known as hexachlorocyclohexane)
DDD	Dichlorodiphenyldichloroethane
DDE	Dichlorodiphenyldichloroethene
DDT	Dichlorodiphenyltrichloroethane
J	Estimated value
NA	Not applicable
ND	Not detected
PAH	Polynuclear aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PRG	Preliminary remediation goal
SVOC	Semivolatile organic compound
Tetra Tech	Tetra Tech EM Inc.
TPH	Total petroleum hydrocarbons
VOC	Volatile organic compound

APPENDIX B
ANALYTICAL RESULTS FROM RECENT SAMPLING EVENTS

70 pages.

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	**ELEMGB001**	**ELEMGB001**	**ELEMGB002**	**ELEMGB002**	**ELEMGB003**	**ELEMGB003**
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 1.0	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
METALS (mg/kg)						
ALUMINUM	14,600	24,700	17,900	11,800	33,800	21,800
ANTIMONY	4.3 J	3.1 J	18.0 R	3.5 J	3.5 J	3.0 J
ARSENIC	11.0 J	3.6 J	9.7 J	7.9 J	6.3 J	3.8 J
BARIUM	126	215	157	103	280	186
BERYLLIUM	0.49 J	0.71	0.66 J	0.42 J	1.1	0.72
CADMIUM	0.70 U	0.63 U	0.90 U	0.63 U	0.62 U	0.61 U
CALCIUM	10,300	9,800	6,270	5,530	10,500	5,700
CHROMIUM	29.0	44.6	37.3	25.4	67.4	42.6
CHROMIUM VI	0.00 U	0.01 U	0.02 U	0.01 U	0.01 U	0.01 U
COBALT	8.0	13.4	11.2	7.6	21.8	19.1
COPPER	26.1 J	21.8 J	35.9 J	26.1 J	74.8 J	33.3 J
IRON	18,700	22,400	25,700	17,800	36,300	21,500
LEAD	29.5 J	20.8 J	43.6 J	38.2 J	28.7 J	**620 J**
MAGNESIUM	4,440	4,770	5,520	3,880	8,260	3,420
MANGANESE	299 J	614 J	441 J	291 J	887 J	813 J
MERCURY	0.21	0.12 J	0.18 U	0.13 U	0.12 U	0.12 U
MOLYBDENUM	7.0 UJ	6.3 UJ	9.0 UJ	6.3 UJ	6.2 UJ	6.1 UJ
NICKEL	29.0 J	53.7 J	36.9 J	24.9 J	73.6 J	69.3 J
SELENIUM	1.4 U	1.3 U	1.8 U	1.3 U	1.2 U	1.2 U
SILVER	2.8 U	2.5 U	3.6 U	2.5 U	2.5 U	2.4 U
SODIUM	222	219	202	142	350	409
THALLIUM	1.4 U	1.3 U	1.8 U	1.3 U	1.2 U	1.2 U
VANADIUM	35.8	42.4	44.4	32.4	73.7	49.7
ZINC	72.0 J	45.8 J	110 J	87.2 J	101 J	36.6 J
VOLATILE ORGANIC COMPOUNDS 8260 (mg/kg)						
1,1,1-TRICHLOROETHANE	0.02 UJ	0.01 UJ	0.02 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,1,2,2-TETRACHLOROETHANE	0.02 UJ	0.01 UJ	0.02 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,1,2-TRICHLOROETHANE	0.02 UJ	0.01 UJ	0.02 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,1-DICHLOROETHANE	0.02 UJ	0.01 UJ	0.02 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,1-DICHLOROETHENE	0.02 UJ	0.01 UJ	0.02 UJ	0.01 UJ	0.01 UJ	0.01 UJ

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB001	ELEMGB001	ELEMGB002	ELEMGB002	ELEMGB003	ELEMGB003
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 1.0	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
VOLATILE ORGANIC COMPOUNDS 8260 (mg/kg) (Continued)						
1,2-DICHLOROETHANE	0.02 UJ	0.01 UJ	0.02 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,2-DICHLOROETHENE	0.02 UJ	0.01 UJ	0.02 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,2-DICHLOROPROPANE	0.02 UJ	0.01 UJ	0.02 UJ	0.01 UJ	0.01 UJ	0.01 UJ
2-BUTANONE	0.02 UJ	0.01 UJ	0.02 UJ	0.01 UJ	0.01 UJ	0.01 UJ
2-HEXANONE	0.02 UJ	0.01 UJ	0.02 UJ	0.01 UJ	0.01 UJ	0.01 UJ
4-METHYL-2-PENTANONE	0.02 UJ	0.01 UJ	0.02 UJ	0.01 UJ	0.01 UJ	0.01 UJ
ACETONE	0.08 J	0.07 J	0.2 J	0.06 J	0.06 UJ	0.04 UJ
BENZENE	0.02 UJ	0.01 UJ	0.02 UJ	0.01 UJ	0.01 UJ	0.01 UJ
BROMODICHLOROMETHANE	0.02 UJ	0.01 UJ	0.02 UJ	0.01 UJ	0.01 UJ	0.01 UJ
BROMOFORM	0.02 UJ	0.01 UJ	0.02 UJ	0.01 UJ	0.01 UJ	0.01 UJ
BROMOMETHANE	0.02 UJ	0.01 UJ	0.02 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CARBON DISULFIDE	0.02 UJ	0.01 UJ	0.02 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CARBON TETRACHLORIDE	0.02 UJ	0.01 UJ	0.02 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CHLOROBENZENE	0.02 UJ	0.01 UJ	0.02 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CHLOROETHANE	0.02 UJ	0.01 UJ	0.02 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CHLOROFORM	0.02 UJ	0.01 UJ	0.02 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CHLOROMETHANE	0.02 UJ	0.01 UJ	0.02 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CIS-1,3-DICHLOROPROPENE	0.02 UJ	0.01 UJ	0.02 UJ	0.01 UJ	0.01 UJ	0.01 UJ
DIBROMOCHLOROMETHANE	0.02 UJ	0.01 UJ	0.02 UJ	0.01 UJ	0.01 UJ	0.01 UJ
ETHYLBENZENE	0.02 UJ	0.01 UJ	0.02 UJ	0.01 UJ	0.01 UJ	0.01 UJ
METHYLENE CHLORIDE	0.02 UJ	0.01 UJ	0.02 UJ	0.01 UJ	0.01 UJ	0.01 UJ
STYRENE	0.02 UJ	0.01 UJ	0.02 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TETRACHLOROETHENE	0.02 UJ	0.01 UJ	0.02 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TOLUENE	0.02 UJ	0.01 UJ	0.02 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TRANS-1,3-DICHLOROPROPENE	0.02 UJ	0.01 UJ	0.02 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TRICHLOROETHENE	0.02 UJ	0.01 UJ	0.02 UJ	0.01 UJ	0.01 UJ	0.01 UJ
VINYL ACETATE	0.02 UJ	0.01 UJ	0.02 UJ	0.01 UJ	0.01 UJ	0.01 UJ
VINYL CHLORIDE	0.02 UJ	0.01 UJ	0.02 UJ	0.01 UJ	0.01 UJ	0.01 UJ
XYLENE (TOTAL)	0.02 UJ	0.01 UJ	0.02 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TOTAL VOCS 8260	0.08 J	0.07 J	0.2 J	0.06 J	0 U	0 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB001	ELEMGB001	ELEMGB002	ELEMGB002	ELEMGB003	ELEMGB003
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 1.0	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SEMIVOLATILE ORGANIC COMPOUNDS (mg/kg)						
BENZO(A)ANTHRACENE	0.05 U	0.04 U	0.06 U	0.04 U	0.04 U	0.04 U
BENZO(A)PYRENE	0.05 U	0.04 U	0.06 U	0.04 U	0.04 U	0.04 U
BENZO(B)FLUORANTHENE	0.05 U	0.04 U	0.06 U	0.04 U	0.04 U	0.04 U
BENZO(G,H,I)PERYLENE	0.05 U	0.04 U	0.06 U	0.04 U	0.04 U	0.04 U
BENZO(K)FLUORANTHENE	0.05 U	0.04 U	0.06 U	0.04 U	0.04 U	0.04 U
DIBENZ(A,H)ANTHRACENE	0.05 U	0.04 U	0.06 U	0.04 U	0.04 U	0.04 U
FLUORANTHENE	0.05 U	0.04 U	0.02 J	0.04 U	0.04 U	0.04 U
FLUORENE	0.05 U	0.04 U	0.06 U	0.04 U	0.04 U	0.04 U
INDENO(1,2,3-CD)PYRENE	0.05 U	0.04 U	0.06 U	0.04 U	0.04 U	0.04 U
PYRENE	0.05 U	0.04 U	0.03 J	0.04 U	0.04 U	0.04 U
TOTAL SVOCS	0 U	0 U	0.05 J	0 U	0 U	0 U
SEMIVOLATILE ORGANIC COMPOUNDS 8270 (mg/kg)						
1,2,4-TRICHLOROBENZENE	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
1,2-DICHLOROBENZENE	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
1,3-DICHLOROBENZENE	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
1,4-DICHLOROBENZENE	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
2,2'-OXYBIS(1-CHLOROPROPANE)	0.5 UJ	0.4 UJ	0.6 UJ	0.4 UJ	0.4 UJ	0.4 UJ
2,4,5-TRICHLOROPHENOL	1 U	1 U	2 U	1 U	1 U	1 U
2,4,6-TRICHLOROPHENOL	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
2,4-DICHLOROPHENOL	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
2,4-DIMETHYLPHENOL	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
2,4-DINITROPHENOL	1 UJ	1 UJ	2 UJ	1 UJ	1 UJ	1 UJ
2,4-DINITROTOLUENE	0.5 UJ	0.4 UJ	0.6 UJ	0.4 UJ	0.4 UJ	0.4 UJ
2,6-DINITROTOLUENE	0.5 UJ	0.4 UJ	0.6 UJ	0.4 UJ	0.4 UJ	0.4 UJ
2-CHLORONAPHTHALENE	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
2-CHLOROPHENOL	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
2-METHYLNAPHTHALENE	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
2-METHYLPHENOL	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
2-NITROANILINE	1 U	1 U	2 U	1 U	1 U	1 UJ
2-NITROPHENOL	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB001	ELEMGB001	ELEMGB002	ELEMGB002	ELEMGB003	ELEMGB003
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 1.0	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SEMIVOLATILE ORGANIC COMPOUNDS 8270 (mg/kg) (Continued)						
3,3'-DICHLOROBENZIDINE	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
3-NITROANILINE	1 U	1 U	2 U	1 U	1 U	1 U
4,6-DINITRO-2-METHYLPHENOL	1 UJ	1 UJ	2 UJ	1 UJ	1 UJ	1 UJ
4-BROMOPHENYL-PHENYL ETHER	1 U	1 U	2 U	1 U	1 U	1 U
4-CHLORO-3-METHYLPHENOL	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
4-CHLOROANILINE	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
4-CHLOROPHENYL-PHENYL ETHER	1 U	1 U	2 U	1 U	1 U	1 U
4-METHYLPHENOL	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
4-NITROANILINE	1 U	1 U	1 U	1 U	1 U	1 U
4-NITROPHENOL	1 U	1 U	1 U	1 U	1 U	1 U
ACENAPHTHENE	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
ACENAPHTHYLENE	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
ANTHRACENE	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
BIS(2-CHLOROETHOXY)METHANE	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
BIS(2-CHLOROETHYL)ETHER	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
BIS(2-ETHYLHEXYL)PHTHALATE	0.4 UJ	0.4 UJ	0.4 UJ	0.2 U	0.4 UJ	0.2 U
BUTYLBENZYLPHTHALATE	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
CARBAZOLE	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
CHRYSENE	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
DI-N-BUTYLPHTHALATE	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
DI-N-OCTYLPHTHALATE	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
DIBENZOFURAN	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
DIETHYLPHTHALATE	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
DIMETHYLPHTHALATE	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
HEXACHLOROBENZENE	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
HEXACHLOROBUTADIENE	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
HEXACHLOROCYCLOPENTADIENE	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
HEXACHLOROETHANE	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
ISOPHORONE	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
N-NITROSO-DI-N-PROPYLAMINE	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 UJ
N-NITROSODIPHENYLAMINE (1)	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB001	ELEMGB001	ELEMGB002	ELEMGB002	ELEMGB003	ELEMGB003
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 1.0	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SEMIVOLATILE ORGANIC COMPOUNDS 8270 (mg/kg)						
NAPHTHALENE	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
NITROBENZENE	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
PENTACHLOROPHENOL	1 U	1 U	2 U	1 U	1 U	1 U
PHENANTHRENE	0.5 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U
PHENOL	0.5 U	0.4 U	0.7	0.4 U	0.4 U	0.4 U
TOTAL SVOCS 8270	0 U	0 U	0.7	0 U	0 U	0 U
PESTICIDES (mg/kg)						
4,4'-DDD	0.005 U	0.004 U	0.009 J	0.004 U	0.004 U	0.004 U
4,4'-DDE	0.005 U	0.004 U	0.006 U	0.004 U	0.004 U	0.004 U
4,4'-DDT	0.005 U	0.003 J	0.006 U	0.004 U	0.004 U	0.004 U
ALDRIN	0.002 U	0.002 U	0.003 U	0.002 U	0.002 U	0.002 U
ALPHA-BHC	0.002 U	0.002 U	0.003 UJ	0.002 U	0.002 U	0.002 U
ALPHA-CHLORDANE	0.002 U	0.002 U	0.003 U	0.002 U	0.002 U	0.002 U
DIELDRIN	0.005 U	0.004 U	0.006 U	0.004 U	0.004 U	0.004 U
ENDRIN	0.005 U	0.004 U	0.006 U	0.004 U	0.004 U	0.004 U
GAMMA-BHC (LINDANE)	0.002 U	0.002 U	0.003 U	0.002 U	0.002 U	0.002 U
GAMMA-CHLORDANE	0.002 U	0.002 U	0.004	0.003	0.002 UJ	0.002 U
HEPTACHLOR	0.002 U	0.002 U	0.003 U	0.002 U	0.002 U	0.002 U
HEPTACHLOR EPOXIDE	0.002 U	0.002 U	0.003 UJ	0.002 U	0.002 U	0.002 U
METHOXYCHLOR	0.02 U	0.02 U	0.03 U	0.02 U	0.02 U	0.02 U
TOXAPHENE	0.2 U	0.2 U	0.3 U	0.2 U	0.2 U	0.2 U
PCBs (mg/kg)						
AROCLOR-1016	0.05 U	0.04 U	0.06 U	0.04 U	0.04 U	0.04 U
AROCLOR-1221	0.09 U	0.08 U	0.1 U	0.09 U	0.08 U	0.08 U
AROCLOR-1232	0.05 U	0.04 U	0.06 U	0.04 U	0.04 U	0.04 U
AROCLOR-1242	0.05 U	0.04 U	0.06 U	0.04 U	0.04 U	0.04 U
AROCLOR-1248	0.05 U	0.04 U	0.06 U	0.04 U	0.04 U	0.04 U
AROCLOR-1254	0.05 U	0.04 U	0.06 U	0.04 U	0.04 U	0.04 U
AROCLOR-1260	0.05 U	0.04 U	0.06 U	0.04 U	0.04 U	0.04 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	**ELEMGB001**	**ELEMGB001**	**ELEMGB002**	**ELEMGB002**	**ELEMGB003**	**ELEMGB003**
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 1.0	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
PCBs (mg/kg)						
TOTAL PCBS	0 U	0 U	0 U	0 U	0 U	0 U
PETROLEUM INDICATORS (mg/kg)						
DIESEL RANGE	14.0 U	12.0 U	18.0 U	13.0 U	12.0 U	12.0 U
GASOLINE RANGE	1.5 U	1.3 U	1.6 U	1.1 U	1.2 U	1.2 U
MOTOR OIL RANGE	59.0 MJ	62.0 U	90.0 U	63.0 U	28.0 MJ	61.0 U
TOTAL TPH	59.0 MJ	0 U	0 U	0 U	28.0 MJ	0 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB004	ELEMGB004	ELEMGB005	ELEMGB005	ELEMGB006	ELEMGB006
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
METALS (mg/kg)						
ALUMINUM	12,600	22,500	10,200	16,800	10,200	19,500
ANTIMONY	12.4 R	4.3 J	2.9 J	11.9 R	3.0 J	2.6 J
ARSENIC	5.4 J	4.1 J	6.1 J	3.3 J	6.7 J	4.3 J
BARIUM	113	192	99.2	136	95.9	170
BERYLLIUM	0.50 J	0.68	0.53 J	0.61	0.44 J	0.63
CADMIUM	0.62 U	0.61 U	0.55 U	0.59 U	0.56 U	0.59 U
CALCIUM	3,610	8,520	1,860	6,100	2,400	5,790
CHROMIUM	26.0	42.2	23.2	32.8	22.6	37.8
CHROMIUM VI	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
COBALT	8.2	16.4	7.5	10.1	6.9	18.0
COPPER	24.2 J	25.1 J	27.7 J	20.5 J	20.3 J	25.0 J
IRON	21,000	25,600	18,700	17,200	19,200	21,600
LEAD	30.2 J	105 J	54.5 J	36.4 J	14.3 J	19.0 J
MAGNESIUM	5,260	4,470	4,250	3,560	4,300	4,570
MANGANESE	296 J	770 J	175 J	323 J	180 J	761 J
MERCURY	0.12 U	0.12 U	0.18	0.12 U	0.09 J	0.12 U
MOLYBDENUM	6.2 UJ	6.1 UJ	0.86 J	5.9 UJ	5.6 UJ	5.9 UJ
NICKEL	26.0 J	63.2 J	20.7 J	38.2 J	18.6 J	47.3 J
SELENIUM	1.2 U	1.2 U	1.1 U	1.2 U	1.1 U	1.2 U
SILVER	2.5 U	2.4 U	2.2 U	2.4 U	2.3 U	2.4 U
SODIUM	185	204	199	468	191	306
THALLIUM	1.2 U	1.2 U	1.1 U	1.2 U	1.1 U	1.2 U
VANADIUM	35.7	42.1	32.2	35.2	33.6	40.4
ZINC	72.9 J	42.7 J	77.1 J	37.0 J	70.7 J	47.3 J
VOLATILE ORGANIC COMPOUNDS 8260 (mg/kg)						
1,1,1-TRICHLOROETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,1,2,2-TETRACHLOROETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,1,2-TRICHLOROETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,1-DICHLOROETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,1-DICHLOROETHENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB004	ELEMGB004	ELEMGB005	ELEMGB005	ELEMGB006	ELEMGB006
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
VOLATILE ORGANIC COMPOUNDS 8260 (mg/kg)						
1,2-DICHLOROETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,2-DICHLOROETHENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,2-DICHLOROPROPANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
2-BUTANONE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
2-HEXANONE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
4-METHYL-2-PENTANONE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.008 J	0.01 UJ
ACETONE	0.07 J	0.04 UJ	0.2 J	0.05 UJ	0.1 J	0.07 J
BENZENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
BROMODICHLOROMETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
BROMOFORM	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
BROMOMETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CARBON DISULFIDE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CARBON TETRACHLORIDE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CHLOROBENZENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CHLOROETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CHLOROFORM	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CHLOROMETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CIS-1,3-DICHLOROPROPENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
DIBROMOCHLOROMETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
ETHYLBENZENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
METHYLENE CHLORIDE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
STYRENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TETRACHLOROETHENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TOLUENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TRANS-1,3-DICHLOROPROPENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TRICHLOROETHENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
VINYL ACETATE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
VINYL CHLORIDE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
XYLENE (TOTAL)	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TOTAL VOCS 8260	0.07 J	0 U	0.2 J	0 U	0.1 J	0.07 J

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB004	ELEMGB004	ELEMGB005	ELEMGB005	ELEMGB006	ELEMGB006
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SEMIVOLATILE ORGANIC COMPOUNDS (mg/kg)						
BENZO(A)ANTHRACENE	0.04 U	0.04 U	0.2 U	0.04 U	0.04 U	0.04 U
BENZO(A)PYRENE	0.04 U	0.04 U	0.2 U	0.04 U	0.04 U	0.04 U
BENZO(B)FLUORANTHENE	0.04 U	0.04 U	0.2 U	0.04 U	0.04 U	0.04 U
BENZO(G,H,I)PERYLENE	0.04 U	0.04 U	0.2 U	0.04 U	0.04 U	0.04 U
BENZO(K)FLUORANTHENE	0.04 U	0.04 U	0.2 U	0.04 U	0.04 U	0.04 U
DIBENZ(A,H)ANTHRACENE	0.04 U	0.04 U	0.2 U	0.04 U	0.04 U	0.04 U
FLUORANTHENE	0.04 U	0.04 U	0.2 U	0.04 U	0.04 U	0.04 U
FLUORENE	0.04 U	0.04 U	0.2 U	0.04 U	0.04 U	0.04 U
INDENO(1,2,3-CD)PYRENE	0.04 U	0.04 U	0.2 U	0.04 U	0.04 U	0.04 U
PYRENE	0.04 U	0.04 U	0.2 U	0.04 U	0.04 U	0.04 U
TOTAL SVOCS	0 U	0 U	0 U	0 U	0 U	0 U
SEMIVOLATILE ORGANIC COMPOUNDS 8270 (mg/kg)						
1,2,4-TRICHLOROBENZENE	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
1,2-DICHLOROBENZENE	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
1,3-DICHLOROBENZENE	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
1,4-DICHLOROBENZENE	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
2,2'-OXYBIS(1-CHLOROPROPANE)	0.4 UJ	0.4 UJ	2 UJ	0.4 UJ	0.7 UJ	0.4 UJ
2,4,5-TRICHLOROPHENOL	1 U	1 U	5 U	1 U	2 U	1 U
2,4,6-TRICHLOROPHENOL	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
2,4-DICHLOROPHENOL	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
2,4-DIMETHYLPHENOL	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
2,4-DINITROPHENOL	1 UJ	1 UJ	5 UJ	1 UJ	2 UJ	1 UJ
2,4-DINITROTOLUENE	0.4 UJ	0.4 UJ	2 UJ	0.4 UJ	0.7 UJ	0.4 UJ
2,6-DINITROTOLUENE	0.4 UJ	0.4 UJ	2 UJ	0.4 UJ	0.7 UJ	0.4 UJ
2-CHLORONAPHTHALENE	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
2-CHLOROPHENOL	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
2-METHYLNAPHTHALENE	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
2-METHYLPHENOL	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
2-NITROANILINE	1 UJ	1 UJ	5 UJ	1 UJ	2 UJ	1 UJ
2-NITROPHENOL	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB004	ELEMGB004	ELEMGB005	ELEMGB005	ELEMGB006	ELEMGB006
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SEMIVOLATILE ORGANIC COMPOUNDS 8270 (mg/kg) (Continued)						
3,3'-DICHLOROBENZIDINE	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
3-NITROANILINE	1 U	1 U	5 U	1 U	2 U	1 U
4,6-DINITRO-2-METHYLPHENOL	1 UJ	1 UJ	5 UJ	1 UJ	2 UJ	1 UJ
4-BROMOPHENYL-PHENYL ETHER	1 U	1 U	5 U	1 U	2 U	1 U
4-CHLORO-3-METHYLPHENOL	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
4-CHLOROANILINE	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
4-CHLOROPHENYL-PHENYL ETHER	1 U	1 U	5 U	1 U	2 U	1 U
4-METHYLPHENOL	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
4-NITROANILINE	1 U	1 U	4 U	1 U	2 U	1 U
4-NITROPHENOL	1 U	1 U	4 U	1 U	2 U	1 U
ACENAPHTHENE	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
ACENAPHTHYLENE	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
ANTHRACENE	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
BIS(2-CHLOROETHOXY)METHANE	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
BIS(2-CHLOROETHYL)ETHER	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
BIS(2-ETHYLHEXYL)PHTHALATE	0.3 UJ	0.2 U	0.9 UJ	0.2 U	0.4 UJ	0.2 U
BUTYLBENZYLPHTHALATE	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
CARBAZOLE	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
CHRYSENE	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
DI-N-BUTYLPHTHALATE	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
DI-N-OCTYLPHTHALATE	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
DIBENZOFURAN	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
DIETHYLPHTHALATE	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
DIMETHYLPHTHALATE	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
HEXACHLOROBENZENE	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
HEXACHLOROBUTADIENE	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
HEXACHLOROCYCLOPENTADIENE	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
HEXACHLOROETHANE	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
ISOPHORONE	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
N-NITROSO-DI-N-PROPYLAMINE	0.4 UJ	0.4 UJ	2 UJ	0.4 UJ	0.7 UJ	0.4 UJ
N-NITROSODIPHENYLAMINE (1)	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB004	ELEMGB004	ELEMGB005	ELEMGB005	ELEMGB006	ELEMGB006
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SEMIVOLATILE ORGANIC COMPOUNDS 8270 (mg/kg) (Continued)						
NAPHTHALENE	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
NITROBENZENE	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
PENTACHLOROPHENOL	1 U	1 U	5 U	1 U	2 U	1 U
PHENANTHRENE	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
PHENOL	0.4 U	0.4 U	2 U	0.4 U	0.7 U	0.4 U
TOTAL SVOCS 8270	0 U	0 U	0 U	0 U	0 U	0 U
PESTICIDES (mg/kg)						
4,4'-DDD	0.003 J	0.004 U	0.006	0.004 U	0.2 U	0.004 U
4,4'-DDE	0.004 U	0.004 U	0.009	0.004 U	0.2 U	0.004 U
4,4'-DDT	0.004 UJ	0.004 U	0.02	0.004 U	0.2 U	0.004 U
ALDRIN	0.002 U	0.002 U	0.002 U	0.002 U	0.1 U	0.002 U
ALPHA-BHC	0.002 UJ	0.002 U	0.002 U	0.002 U	0.1 U	0.002 U
ALPHA-CHLORDANE	0.001 J	0.002 U	0.003	0.002 U	0.1 U	0.002 U
DIELDRIN	0.004 UJ	0.004 U	0.004 U	0.004 U	0.2 U	0.004 U
ENDRIN	0.004	0.004 U	0.004 U	0.004 U	0.2 U	0.004 U
GAMMA-BHC (LINDANE)	0.002 U	0.002 U	0.002 U	0.002 U	0.1 U	0.002 U
GAMMA-CHLORDANE	0.002 J	0.002 U	0.03 J	0.002 U	0.1 U	0.002 U
HEPTACHLOR	0.002 U	0.002 U	0.002 U	0.002 U	0.1 U	0.002 U
HEPTACHLOR EPOXIDE	0.002 U	0.002 U	0.002 U	0.002 U	0.1 U	0.002 U
METHOXYCHLOR	0.02 U	0.02 U	0.02 U	0.02 U	1 U	0.02 U
TOXAPHENE	0.2 U	0.2 U	0.2 U	0.2 U	10 U	0.2 U
PCBs (mg/kg)						
AROCLOR-1016	0.04 U	0.04 U	0.04 U	0.04 U	2 U	0.04 U
AROCLOR-1221	0.08 U	0.08 U	0.07 U	0.08 U	4 U	0.08 U
AROCLOR-1232	0.04 U	0.04 U	0.04 U	0.04 U	2 U	0.04 U
AROCLOR-1242	0.04 U	0.04 U	0.04 U	0.04 U	2 U	0.04 U
AROCLOR-1248	0.04 U	0.04 U	0.04 U	0.04 U	2 U	0.04 U
AROCLOR-1254	0.04 U	0.04 U	0.04 U	0.04 U	2 U	0.04 U
AROCLOR-1260	0.04 U	0.04 U	0.04 U	0.04 U	2 U	0.04 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	**ELEMGB004**	**ELEMGB004**	**ELEMGB005**	**ELEMGB005**	**ELEMGB006**	**ELEMGB006**
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
PCBs (mg/kg) (Continued)						
TOTAL PCBS	0 U	0 U	0 U	0 U	0 U	0 U
PETROLEUM INDICATORS (mg/kg)						
DIESEL RANGE	12.0 H	12.0 U	190 H	12.0 U	69.0 H	12.0 U
GASOLINE RANGE	1.1 U	1.1 U	1.2 U	0.97 U	3.3 ZJ	0.82 ZJ
MOTOR OIL RANGE	42.0 MJ	61.0 U	180 M	59.0 U	60.0 L	59.0 U
TOTAL TPH	54.0 MJH	0 U	370 HM	0 U	129 HL	0 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB007	ELEMGB007	ELEMGB008	ELEMGB008	ELEMGB009	ELEMGB009
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
METALS (mg/kg)						
ALUMINUM	9,770	19,900	6,870	19,200	11,600	22,100
ANTIMONY	11.2 R	2.9 J	2.5 J	2.5 J	12.1 R	12.1 R
ARSENIC	5.6 J	2.3 J	2.5 J	2.4 J	6.9 J	2.7 J
BARIUM	95.5	196	41.7	198	122	144
BERYLLIUM	0.38 J	0.62	0.19 J	0.69	0.55 J	0.72
CADMIUM	0.56 U	0.59 U	0.56 U	0.61 U	0.60 U	0.60 U
CALCIUM	3,180	5,480	3,400	7,440	3,190	6,760
CHROMIUM	20.6	38.6	42.3	35.7	26.4	42.4
CHROMIUM VI	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
COBALT	5.5	11.8	6.3	10.4	8.2	14.6
COPPER	16.9 J	17.1 J	10.3 J	21.0 J	24.3 J	18.0 J
IRON	16,200	18,800	12,300	19,300	23,600	20,500
LEAD	12.3 J	19.1 J	12.4 J	35.8 J	20.6 J	7.7 J
MAGNESIUM	3,880	3,470	3,070	3,700	4,860	3,980
MANGANESE	186 J	384 J	206 J	382 J	284 J	360 J
MERCURY	0.05 J	0.12 U	0.04 J	0.12 U	0.04 J	0.12 U
MOLYBDENUM	5.6 UJ	5.9 UJ	5.6 UJ	6.1 UJ	6.0 UJ	6.0 UJ
NICKEL	18.6 J	40.3 J	33.2 J	57.2 J	25.1 J	51.2 J
SELENIUM	1.1 U	1.2 U	1.1 U	1.2 U	1.2 U	1.2 U
SILVER	2.2 U	2.4 U	2.2 U	2.5 U	2.4 U	2.4 U
SODIUM	179	399	125	230	159	554
THALLIUM	1.1 U	1.2 U	1.1 U	1.2 U	1.2 U	1.2 U
VANADIUM	28.4	38.1	27.0	39.2	40.8	40.4
ZINC	61.0 J	29.9 J	58.0 J	39.4 J	93.2 J	34.6 J
VOLATILE ORGANIC COMPOUNDS 8260 (mg/kg)						
1,1,1-TRICHLOROETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,1,2,2-TETRACHLOROETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,1,2-TRICHLOROETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,1-DICHLOROETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,1-DICHLOROETHENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB007	ELEMGB007	ELEMGB008	ELEMGB008	ELEMGB009	ELEMGB009
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
VOLATILE ORGANIC COMPOUNDS 8260 (mg/kg) (Continued)						
1,2-DICHLOROETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,2-DICHLOROETHENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,2-DICHLOROPROPANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
2-BUTANONE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
2-HEXANONE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
4-METHYL-2-PENTANONE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
ACETONE	0.06 UJ	0.05 UJ	0.08 J	0.05 UJ	0.1 J	0.04 UJ
BENZENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
BROMODICHLOROMETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
BROMOFORM	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
BROMOMETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CARBON DISULFIDE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CARBON TETRACHLORIDE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CHLOROBENZENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CHLOROETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CHLOROFORM	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CHLOROMETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CIS-1,3-DICHLOROPROPENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
DIBROMOCHLOROMETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
ETHYLBENZENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
METHYLENE CHLORIDE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
STYRENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TETRACHLOROETHENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TOLUENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TRANS-1,3-DICHLOROPROPENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TRICHLOROETHENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
VINYL ACETATE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
VINYL CHLORIDE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
XYLENE (TOTAL)	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TOTAL VOCS 8260	0 U	0 U	0.08 J	0 U	0.1 J	0 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB007	ELEMGB007	ELEMGB008	ELEMGB008	ELEMGB009	ELEMGB009
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SEMIVOLATILE ORGANIC COMPOUNDS (mg/kg)						
BENZO(A)ANTHRACENE	0.2 U	0.04 U	0.04 U	0.04 U	0.2 U	0.04 U
BENZO(A)PYRENE	0.2 U	0.04 U	0.04 U	0.04 U	0.2 U	0.04 U
BENZO(B)FLUORANTHENE	0.2 U	0.04 U	0.04 U	0.04 U	0.2 U	0.04 U
BENZO(G,H,I)PERYLENE	0.2 U	0.04 U	0.04 U	0.04 U	0.2 U	0.04 U
BENZO(K)FLUORANTHENE	0.2 U	0.04 U	0.04 U	0.04 U	0.2 U	0.04 U
DIBENZ(A,H)ANTHRACENE	0.2 U	0.04 U	0.04 U	0.04 U	0.2 U	0.04 U
FLUORANTHENE	0.2 U	0.04 U	0.04 U	0.04 U	0.2 U	0.04 U
FLUORENE	0.2 U	0.04 U	0.04 U	0.04 U	0.2 U	0.04 U
INDENO(1,2,3-CD)PYRENE	0.2 U	0.04 U	0.04 U	0.04 U	0.2 U	0.04 U
PYRENE	0.2 U	0.04 U	0.04 U	0.04 U	0.2 U	0.04 U
TOTAL SVOCS	0 U	0 U	0 U	0 U	0 U	0 U
SEMIVOLATILE ORGANIC COMPOUNDS 8270 (mg/kg)						
1,2,4-TRICHLOROBENZENE	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
1,2-DICHLOROBENZENE	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
1,3-DICHLOROBENZENE	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
1,4-DICHLOROBENZENE	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
2,2'-OXYBIS(1-CHLOROPROPANE)	2 UJ	0.4 UJ	0.4 UJ	0.4 UJ	2 UJ	0.4 UJ
2,4,5-TRICHLOROPHENOL	5 U	1 U	0.9 U	1 U	5 U	1 U
2,4,6-TRICHLOROPHENOL	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
2,4-DICHLOROPHENOL	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
2,4-DIMETHYLPHENOL	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
2,4-DINITROPHENOL	5 UJ	1 UJ	0.9 UJ	1 UJ	5 UJ	1 UJ
2,4-DINITROTOLUENE	2 UJ	0.4 UJ	0.4 UJ	0.4 UJ	2 UJ	0.4 UJ
2,6-DINITROTOLUENE	2 UJ	0.4 UJ	0.4 UJ	0.4 UJ	2 UJ	0.4 UJ
2-CHLORONAPHTHALENE	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
2-CHLOROPHENOL	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
2-METHYLNAPHTHALENE	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
2-METHYLPHENOL	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
2-NITROANILINE	5 UJ	1 UJ	0.9 UJ	1 UJ	5 UJ	1 UJ
2-NITROPHENOL	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB007	ELEMGB007	ELEMGB008	ELEMGB008	ELEMGB009	ELEMGB009
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SEMIVOLATILE ORGANIC COMPOUNDS 8270 (mg/kg) (Continued)						
3,3'-DICHLOROBENZIDINE	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
3-NITROANILINE	5 U	1 U	0.9 U	1 U	5 U	1 U
4,6-DINITRO-2-METHYLPHENOL	5 UJ	1 UJ	0.9 UJ	1 UJ	5 UJ	1 UJ
4-BROMOPHENYL-PHENYL ETHER	5 U	1 U	0.9 U	1 U	5 U	1 U
4-CHLORO-3-METHYLPHENOL	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
4-CHLOROANILINE	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
4-CHLOROPHENYL-PHENYL ETHER	5 U	1 U	0.9 U	1 U	5 U	1 U
4-METHYLPHENOL	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
4-NITROANILINE	5 U	1 U	0.9 U	1 U	5 U	1 U
4-NITROPHENOL	5 U	1 U	0.9 U	1 U	5 U	1 U
ACENAPHTHENE	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
ACENAPHTHYLENE	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
ANTHRACENE	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
BIS(2-CHLOROETHOXY)METHANE	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
BIS(2-CHLOROETHYL)ETHER	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
BIS(2-ETHYLHEXYL)PHTHALATE	0.9 UJ	0.2 U	0.5 UJ	0.2 UJ	1 UJ	0.2 U
BUTYLBENZYLPHTHALATE	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
CARBAZOLE	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
CHRYSENE	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
DI-N-BUTYLPHTHALATE	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
DI-N-OCTYLPHTHALATE	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
DIBENZOFURAN	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
DIETHYLPHTHALATE	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
DIMETHYLPHTHALATE	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
HEXACHLOROBENZENE	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
HEXACHLOROBUTADIENE	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
HEXACHLOROCYCLOPENTADIENE	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
HEXACHLOROETHANE	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
ISOPHORONE	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
N-NITROSO-DI-N-PROPYLAMINE	2 UJ	0.4 UJ	0.4 UJ	0.4 UJ	2 UJ	0.4 UJ
N-NITROSODIPHENYLAMINE (1)	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB007	ELEMGB007	ELEMGB008	ELEMGB008	ELEMGB009	ELEMGB009
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SEMIVOLATILE ORGANIC COMPOUNDS 8270 (mg/kg) (Continued)						
NAPHTHALENE	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
NITROBENZENE	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
PENTACHLOROPHENOL	5 U	1 U	0.9 U	1 U	5 U	1 U
PHENANTHRENE	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
PHENOL	2 U	0.4 U	0.4 U	0.4 U	2 U	0.4 U
TOTAL SVOCS 8270	0 U	0 U	0 U	0 U	0 U	0 U
PESTICIDES (mg/kg)						
4,4'-DDD	0.004 U	0.004 U	0.004 UJ	0.004 U	0.004 UJ	0.004 U
4,4'-DDE	0.005	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
4,4'-DDT	0.002 J	0.004 U	0.003 J	0.004 U	0.004 UJ	0.004 U
ALDRIN	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
ALPHA-BHC	0.001 J	0.002 U	0.01	0.002 U	0.002 U	0.002 U
ALPHA-CHLORDANE	0.006	0.002 U	0.004	0.002 U	0.003 J	0.002 U
DIELDRIN	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
ENDRIN	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
GAMMA-BHC (LINDANE)	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
GAMMA-CHLORDANE	0.007 J	0.002 U	0.003	0.003 J	0.002 U	0.002 U
HEPTACHLOR	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
HEPTACHLOR EPOXIDE	0.002 U	0.002 U	0.002 U	0.003 J	0.002 U	0.002 U
METHOXYCHLOR	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
TOXAPHENE	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
PCBs (mg/kg)						
AROCLOR-1016	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
AROCLOR-1221	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U
AROCLOR-1232	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
AROCLOR-1242	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
AROCLOR-1248	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
AROCLOR-1254	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
AROCLOR-1260	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	**ELEMGB007**	**ELEMGB007**	**ELEMGB008**	**ELEMGB008**	**ELEMGB009**	**ELEMGB009**
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
PCBs (mg/kg) (Continued)						
TOTAL PCBS	0 U	0 U	0 U	0 U	0 U	0 U
PETROLEUM INDICATORS (mg/kg)						
DIESEL RANGE	**470 H**	12.0 U	11.0 U	12.0 U	**960 HJ**	12.0 U
GASOLINE RANGE	1.4 ZJ	1.1 U	1.0 U	1.3 U	1.1 ZJ	1.1 U
MOTOR OIL RANGE	400 M	59.0 U	100 M	61.0 U	**810 MJ**	60.0 U
TOTAL TPH	870 HM	0 U	100 M	0 U	1,770 HJMJ	0 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB010	ELEMGB010	ELEMGB011	ELEMGB011	ELEMGB012	ELEMGB012
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
METALS (mg/kg)						
ALUMINUM	8,650	22,600	7,350	21,700	6,050	10,800
ANTIMONY	3.1 J	12.3 R	2.6 J	2.5 J	10.5 R	10.6 R
ARSENIC	4.8 J	3.1 J	1.5 J	3.0 J	2.4	5.5
BARIUM	49.2	175	35.2	169	33.6	70.6
BERYLLIUM	0.44 J	0.76	0.19 J	0.66	0.53 U	0.31 J
CADMIUM	0.55 U	0.62 U	0.53 U	0.59 U	0.53 U	0.53 U
CALCIUM	8,170	7,620	3,210	7,400	2,330	6,340
CHROMIUM	10.7	40.6	42.8	37.7	47.7	12.5
CHROMIUM VI	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
COBALT	6.7	12.5	6.6	11.7	6.9	7.7
COPPER	26.2 J	36.2 J	7.4 J	21.8 J	7.8	61.0
IRON	19,700	22,200	12,800	20,900	12,300	12,300
LEAD	18.6 J	43.5 J	13.7 J	42.6 J	7.9	52.8
MAGNESIUM	4,220	4,290	2,370	3,990	2,520	1,480
MANGANESE	275 J	483 J	209 J	320 J	197	387
MERCURY	0.11 U	0.12 U	0.04 J	0.12 U	0.11 U	0.11
MOLYBDENUM	5.5 UJ	6.2 UJ	5.3 UJ	5.9 UJ	5.3 UJ	5.3 UJ
NICKEL	10.1 J	70.3 J	32.5 J	41.8 J	33.5	11.7
SELENIUM	1.1 U	1.2 U	0.45 J	1.2 U	0.38 UJ	0.40 UJ
SILVER	2.2 U	2.5 U	2.1 U	2.4 U	2.1 U	2.1 U
SODIUM	207	193	135 UJ	170 UJ	170 J	1,040 J
THALLIUM	1.1 U	1.2 U	1.1 U	1.2 U	1.1 U	1.1 U
VANADIUM	46.1	45.1	28.2	41.1	26.3	20.5
ZINC	79.5 J	45.0 J	27.4 J	40.9 J	25.6	196
VOLATILE ORGANIC COMPOUNDS 8260 (mg/kg)						
1,1,1-TRICHLOROETHANE	0.01 UJ	0.01 UJ	0.009 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,1,2,2-TETRACHLOROETHANE	0.01 UJ	0.01 UJ	0.009 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,1,2-TRICHLOROETHANE	0.01 UJ	0.01 UJ	0.009 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,1-DICHLOROETHANE	0.01 UJ	0.01 UJ	0.009 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,1-DICHLOROETHENE	0.01 UJ	0.01 UJ	0.009 UJ	0.01 UJ	0.01 UJ	0.01 UJ

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB010	ELEMGB010	ELEMGB011	ELEMGB011	ELEMGB012	ELEMGB012
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
VOLATILE ORGANIC COMPOUNDS 8260 (mg/kg) (Continued)						
1,2-DICHLOROETHANE	0.01 UJ	0.01 UJ	0.009 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,2-DICHLOROETHENE	0.01 UJ	0.01 UJ	0.009 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,2-DICHLOROPROPANE	0.01 UJ	0.01 UJ	0.009 UJ	0.01 UJ	0.01 UJ	0.01 UJ
2-BUTANONE	0.01 UJ	0.01 UJ	0.009 UJ	0.01 UJ	0.01 UJ	0.01 UJ
2-HEXANONE	0.01 UJ	0.01 UJ	0.009 UJ	0.01 UJ	0.01 UJ	0.01 UJ
4-METHYL-2-PENTANONE	0.01 UJ	0.01 UJ	0.009 UJ	0.01 UJ	0.01 UJ	0.01 UJ
ACETONE	0.06 J	0.08 J	0.05 J	0.06 J	0.08 UJ	0.03 UJ
BENZENE	0.01 UJ	0.01 UJ	0.009 UJ	0.01 UJ	0.01 UJ	0.01 UJ
BROMODICHLOROMETHANE	0.01 UJ	0.01 UJ	0.009 UJ	0.01 UJ	0.01 UJ	0.01 UJ
BROMOFORM	0.01 UJ	0.01 UJ	0.009 UJ	0.01 UJ	0.01 UJ	0.01 UJ
BROMOMETHANE	0.01 UJ	0.01 UJ	0.009 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CARBON DISULFIDE	0.01 UJ	0.01 UJ	0.009 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CARBON TETRACHLORIDE	0.01 UJ	0.01 UJ	0.009 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CHLOROBENZENE	0.01 UJ	0.01 UJ	0.009 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CHLOROETHANE	0.01 UJ	0.01 UJ	0.009 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CHLOROFORM	0.01 UJ	0.01 UJ	0.009 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CHLOROMETHANE	0.01 UJ	0.01 UJ	0.009 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CIS-1,3-DICHLOROPROPENE	0.01 UJ	0.01 UJ	0.009 UJ	0.01 UJ	0.01 UJ	0.01 UJ
DIBROMOCHLOROMETHANE	0.01 UJ	0.01 UJ	0.009 UJ	0.01 UJ	0.01 UJ	0.01 UJ
ETHYLBENZENE	0.01 UJ	0.01 UJ	0.009 UJ	0.01 UJ	0.01 UJ	0.01 UJ
METHYLENE CHLORIDE	0.01 UJ	0.01 UJ	0.009 UJ	0.01 UJ	0.01 UJ	0.01 UJ
STYRENE	0.01 UJ	0.01 UJ	0.009 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TETRACHLOROETHENE	0.01 UJ	0.01 UJ	0.009 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TOLUENE	0.01 UJ	0.01 UJ	0.009 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TRANS-1,3-DICHLOROPROPENE	0.01 UJ	0.01 UJ	0.009 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TRICHLOROETHENE	0.01 UJ	0.01 UJ	0.009 UJ	0.01 UJ	0.01 UJ	0.01 UJ
VINYL ACETATE	0.01 UJ	0.01 UJ	0.009 UJ	0.01 UJ	0.01 UJ	0.01 UJ
VINYL CHLORIDE	0.01 UJ	0.01 UJ	0.009 UJ	0.01 UJ	0.01 UJ	0.01 UJ
XYLENE (TOTAL)	0.01 UJ	0.01 UJ	0.009 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TOTAL VOCS 8260	0.06 J	0.08 J	0.05 J	0.06 J	0 U	0 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB010	ELEMGB010	ELEMGB011	ELEMGB011	ELEMGB012	ELEMGB012
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SEMIVOLATILE ORGANIC COMPOUNDS (mg/kg)						
BENZO(A)ANTHRACENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
BENZO(A)PYRENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
BENZO(B)FLUORANTHENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
BENZO(G,H,I)PERYLENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
BENZO(K)FLUORANTHENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
DIBENZ(A,H)ANTHRACENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
FLUORANTHENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.02 J
FLUORENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
INDENO(1,2,3-CD)PYRENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
PYRENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.02 J
TOTAL SVOCS	0 U	0 U	0 U	0 U	0 U	0.03 J
SEMIVOLATILE ORGANIC COMPOUNDS 8270 (mg/kg)						
1,2,4-TRICHLOROBENZENE	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
1,2-DICHLOROBENZENE	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
1,3-DICHLOROBENZENE	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
1,4-DICHLOROBENZENE	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
2,2'-OXYBIS(1-CHLOROPROPANE)	0.4 UJ	0.4 UJ	0.7 UJ	0.4 UJ	0.4 UJ	0.4 UJ
2,4,5-TRICHLOROPHENOL	0.9 U	1 U	2 U	1 U	0.9 U	0.9 U
2,4,6-TRICHLOROPHENOL	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
2,4-DICHLOROPHENOL	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
2,4-DIMETHYLPHENOL	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
2,4-DINITROPHENOL	0.9 UJ	1 UJ	2 UJ	1 UJ	0.9 UJ	0.9 UJ
2,4-DINITROTOLUENE	0.4 UJ	0.4 UJ	0.7 UJ	0.4 UJ	0.4 UJ	0.4 UJ
2,6-DINITROTOLUENE	0.4 UJ	0.4 UJ	0.7 UJ	0.4 UJ	0.4 UJ	0.4 UJ
2-CHLORONAPHTHALENE	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
2-CHLOROPHENOL	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
2-METHYLNAPHTHALENE	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
2-METHYLPHENOL	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
2-NITROANILINE	0.9 UJ	1 UJ	2 UJ	1 UJ	0.9 UJ	0.9 UJ
2-NITROPHENOL	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB010	ELEMGB010	ELEMGB011	ELEMGB011	ELEMGB012	ELEMGB012
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SEMIVOLATILE ORGANIC COMPOUNDS 8270 (mg/kg) (Continued)						
3,3'-DICHLOROBENZIDINE	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
3-NITROANILINE	0.9 U	1 U	2 U	1 U	0.9 U	0.9 U
4,6-DINITRO-2-METHYLPHENOL	0.9 UJ	1 UJ	2 UJ	1 UJ	0.9 UJ	0.9 UJ
4-BROMOPHENYL-PHENYL ETHER	0.9 U	1 U	2 U	1 U	0.9 U	0.9 U
4-CHLORO-3-METHYLPHENOL	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
4-CHLOROANILINE	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
4-CHLOROPHENYL-PHENYL ETHER	0.9 U	1 U	2 U	1 U	0.9 U	0.9 U
4-METHYLPHENOL	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
4-NITROANILINE	0.9 U	1 U	2 U	0.9 U	0.8 U	0.9 U
4-NITROPHENOL	0.9 U	1 U	2 U	0.9 U	0.8 U	0.9 U
ACENAPHTHENE	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
ACENAPHTHYLENE	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
ANTHRACENE	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
BIS(2-CHLOROETHOXY)METHANE	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
BIS(2-CHLOROETHYL)ETHER	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
BIS(2-ETHYLHEXYL)PHTHALATE	0.4 UJ	0.2 U	0.4 UJ	0.2 U	0.2 UJ	0.2 UJ
BUTYLBENZYLPHTHALATE	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
CARBAZOLE	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
CHRYSENE	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
DI-N-BUTYLPHTHALATE	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
DI-N-OCTYLPHTHALATE	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
DIBENZOFURAN	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
DIETHYLPHTHALATE	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
DIMETHYLPHTHALATE	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
HEXACHLOROBENZENE	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
HEXACHLOROBUTADIENE	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
HEXACHLOROCYCLOPENTADIENE	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
HEXACHLOROETHANE	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
ISOPHORONE	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
N-NITROSO-DI-N-PROPYLAMINE	0.4 UJ	0.4 UJ	0.7 U	0.4 U	0.4 U	0.4 U
N-NITROSODIPHENYLAMINE (1)	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB010	ELEMGB010	ELEMGB011	ELEMGB011	ELEMGB012	ELEMGB012
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SEMIVOLATILE ORGANIC COMPOUNDS 8270 (mg/kg) (Continued)						
NAPHTHALENE	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
NITROBENZENE	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
PENTACHLOROPHENOL	0.9 U	1 U	2 U	1 U	0.9 U	0.9 U
PHENANTHRENE	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
PHENOL	0.4 U	0.4 U	0.7 U	0.4 U	0.4 U	0.4 U
TOTAL SVOCS 8270	0 U	0 U	0 U	0 U	0 U	0 U
PESTICIDES (mg/kg)						
4,4'-DDD	0.002 J	0.004 U	0.004 UJ	0.004 U	0.004 U	0.002 J
4,4'-DDE	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 UJ
4,4'-DDT	0.003 J	0.004 U	0.004 UJ	0.004 U	0.004 U	0.004
ALDRIN	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
ALPHA-BHC	0.002 U	0.002 U	0.006	0.002 U	0.002 U	0.002 U
ALPHA-CHLORDANE	0.02 J	0.002 U	0.002 J	0.002 U	0.002 U	0.002 U
DIELDRIN	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
ENDRIN	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
GAMMA-BHC (LINDANE)	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
GAMMA-CHLORDANE	0.01	0.002 U	0.002	0.002 U	0.002 U	0.002 U
HEPTACHLOR	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
HEPTACHLOR EPOXIDE	0.003 J	0.002 U	0.001 J	0.002 U	0.002 U	0.002 U
METHOXYCHLOR	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
TOXAPHENE	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
PCBs (mg/kg)						
AROCLOR-1016	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
AROCLOR-1221	0.07 U	0.08 U	0.07 U	0.08 U	0.07 U	0.07 U
AROCLOR-1232	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
AROCLOR-1242	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
AROCLOR-1248	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
AROCLOR-1254	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
AROCLOR-1260	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.02 J

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	**ELEMGB010**	**ELEMGB010**	**ELEMGB011**	**ELEMGB011**	**ELEMGB012**	**ELEMGB012**
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
PCBs (mg/kg) (Continued)						
TOTAL PCBS	0 U	0 U	0 U	0 U	0 U	0.02 J
PETROLEUM INDICATORS (mg/kg)						
DIESEL RANGE	11.0 U	12.0 U	11.0 U	12.0 U	10.0 U	11.0 U
GASOLINE RANGE	1.1 U	1.0 U	0.91 U	1.0 U	0.99 U	0.99 U
MOTOR OIL RANGE	110 M	62.0 U	41.0 MJ	59.0 U	52.0 U	98.0 M
TOTAL TPH	110 M	0 U	41.0 MJ	0 U	0 U	98.0 M

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	**ELEMGB013**	**ELEMGB013**	**ELEMGB014**	**ELEMGB014**	**ELEMGB015**	**ELEMGB015**
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
METALS (mg/kg)						
ALUMINUM	18,200	12,300	17,100	15,100	19,300	20,400
ANTIMONY	3.9 J	2.8 J	11.5 R	11.6 R	2.7 J	10.7 R
ARSENIC	**7.4**	4.3	5.9	4.3	8.0	1.1 U
BARIUM	217	93.4	168	97.4	216	11.2
BERYLLIUM	0.44 J	0.59 J	0.41 J	0.61	0.46 J	0.54 U
CADMIUM	0.59 U	0.60 U	0.57 U	0.58 U	0.58 U	0.54 U
CALCIUM	3,770	4,920	6,210	4,140	4,570	30,200
CHROMIUM	34.4	23.1	26.4	26.8	34.4	8.6
CHROMIUM VI	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
COBALT	14.1	9.1	12.0	7.6	15.4	18.1
COPPER	45.5	23.3	36.5	14.3	46.5	37.2
IRON	31,000	14,300	25,600	16,600	33,500	**45,800**
LEAD	8.7	7.6	9.5	6.9	9.0	1.1 U
MAGNESIUM	6,380	3,170	5,910	2,930	6,930	14,900
MANGANESE	602	338	559	369	676	600
MERCURY	0.09 J	0.12 U	0.32	0.12 U	0.24	0.78
MOLYBDENUM	5.9 UJ	6.0 UJ	5.7 UJ	5.8 UJ	5.8 UJ	5.4 UJ
NICKEL	38.6	30.4	34.2	29.0	39.9	11.5
SELENIUM	1.3 UJ	0.64 UJ	0.82 UJ	0.68 UJ	1.5 UJ	2.0 UJ
SILVER	2.4 U	2.4 U	2.3 U	2.3 U	2.3 U	2.1 U
SODIUM	229 J	520 J	3,370 J	412 J	231 J	2,390 J
THALLIUM	0.60 UJ	1.2 U	1.2 U	1.2 U	0.77 UJ	1.1 U
VANADIUM	55.2	33.7	48.4	33.0	60.4	141
ZINC	75.8	30.3	68.1	26.0	81.8	61.0
VOLATILE ORGANIC COMPOUNDS 8260 (mg/kg)						
1,1,1-TRICHLOROETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,1,2,2-TETRACHLOROETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,1,2-TRICHLOROETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,1-DICHLOROETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,1-DICHLOROETHENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB013	ELEMGB013	ELEMGB014	ELEMGB014	ELEMGB015	ELEMGB015
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
VOLATILE ORGANIC COMPOUNDS 8260 (mg/kg) (Continued)						
1,2-DICHLOROETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,2-DICHLOROETHENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,2-DICHLOROPROPANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
2-BUTANONE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
2-HEXANONE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
4-METHYL-2-PENTANONE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
ACETONE	0.1 UJ	0.07 UJ	0.1 UJ	0.07 UJ	0.05 UJ	0.01 UJ
BENZENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
BROMODICHLOROMETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
BROMOFORM	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
BROMOMETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CARBON DISULFIDE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CARBON TETRACHLORIDE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CHLOROBENZENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CHLOROETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CHLOROFORM	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CHLOROMETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CIS-1,3-DICHLOROPROPENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
DIBROMOCHLOROMETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
ETHYLBENZENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
METHYLENE CHLORIDE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
STYRENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TETRACHLOROETHENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TOLUENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TRANS-1,3-DICHLOROPROPENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TRICHLOROETHENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
VINYL ACETATE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
VINYL CHLORIDE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
XYLENE (TOTAL)	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TOTAL VOCS 8260	0 U	0 U	0 U	0 U	0 U	0 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB013	ELEMGB013	ELEMGB014	ELEMGB014	ELEMGB015	ELEMGB015
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SEMIVOLATILE ORGANIC COMPOUNDS (mg/kg)						
BENZO(A)ANTHRACENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
BENZO(A)PYRENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
BENZO(B)FLUORANTHENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
BENZO(G,H,I)PERYLENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
BENZO(K)FLUORANTHENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
DIBENZ(A,H)ANTHRACENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
FLUORANTHENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
FLUORENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
INDENO(1,2,3-CD)PYRENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
PYRENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 UJ
TOTAL SVOCS	0 U	0 U	0 U	0 U	0 U	0 U
SEMIVOLATILE ORGANIC COMPOUNDS 8270 (mg/kg)						
1,2,4-TRICHLOROBENZENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,2-DICHLOROBENZENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,3-DICHLOROBENZENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,4-DICHLOROBENZENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
2,2'-OXYBIS(1-CHLOROPROPANE)	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ
2,4,5-TRICHLOROPHENOL	1 U	1 U	1 U	1 U	1 U	0.9 U
2,4,6-TRICHLOROPHENOL	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
2,4-DICHLOROPHENOL	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
2,4-DIMETHYLPHENOL	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
2,4-DINITROPHENOL	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	0.9 UJ
2,4-DINITROTOLUENE	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ
2,6-DINITROTOLUENE	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ
2-CHLORONAPHTHALENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
2-CHLOROPHENOL	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
2-METHYLNAPHTHALENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
2-METHYLPHENOL	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
2-NITROANILINE	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	0.9 UJ
2-NITROPHENOL	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB013	ELEMGB013	ELEMGB014	ELEMGB014	ELEMGB015	ELEMGB015
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SEMIVOLATILE ORGANIC COMPOUNDS 8270 (mg/kg) (Continued)						
3,3'-DICHLOROBENZIDINE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
3-NITROANILINE	1 U	1 U	1 U	1 U	1 U	0.9 U
4,6-DINITRO-2-METHYLPHENOL	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	0.9 UJ
4-BROMOPHENYL-PHENYL ETHER	1 U	1 U	1 U	1 U	1 U	0.9 U
4-CHLORO-3-METHYLPHENOL	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
4-CHLOROANILINE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
4-CHLOROPHENYL-PHENYL ETHER	1 U	1 U	1 U	1 U	1 U	0.9 U
4-METHYLPHENOL	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
4-NITROANILINE	0.9 U	1 U	0.9 U	0.9 U	0.9 U	0.9 U
4-NITROPHENOL	0.9 U	1 U	0.9 U	0.9 U	0.9 U	0.9 U
ACENAPHTHENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
ACENAPHTHYLENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
ANTHRACENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
BIS(2-CHLOROETHOXY)METHANE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
BIS(2-CHLOROETHYL)ETHER	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
BIS(2-ETHYLHEXYL)PHTHALATE	0.2 UJ	0.2 U	0.3 UJ	0.2 U	0.2 UJ	0.2 UJ
BUTYLBENZYLPHTHALATE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
CARBAZOLE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
CHRYSENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
DI-N-BUTYLPHTHALATE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
DI-N-OCTYLPHTHALATE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
DIBENZOFURAN	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
DIETHYLPHTHALATE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
DIMETHYLPHTHALATE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
HEXACHLOROBENZENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
HEXACHLOROBUTADIENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
HEXACHLOROCYCLOPENTADIENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
HEXACHLOROETHANE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
ISOPHORONE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
N-NITROSO-DI-N-PROPYLAMINE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
N-NITROSODIPHENYLAMINE (1)	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB013	ELEMGB013	ELEMGB014	ELEMGB014	ELEMGB015	ELEMGB015
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SEMIVOLATILE ORGANIC COMPOUNDS 8270 (mg/kg)						
NAPHTHALENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
NITROBENZENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
PENTACHLOROPHENOL	1 U	1 U	1 U	1 U	1 U	0.9 U
PHENANTHRENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
PHENOL	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
TOTAL SVOCS 8270	0 U	0 U	0 U	0 U	0 U	0 U
PESTICIDES (mg/kg)						
4,4'-DDD	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
4,4'-DDE	0.05	0.004 U	0.06	0.004 U	0.02	0.004 U
4,4'-DDT	0.02	0.004 U	0.02	0.004 U	0.009	0.004 U
ALDRIN	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
ALPHA-BHC	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
ALPHA-CHLORDANE	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
DIELDRIN	0.004 UJ	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
ENDRIN	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
GAMMA-BHC (LINDANE)	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
GAMMA-CHLORDANE	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
HEPTACHLOR	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
HEPTACHLOR EPOXIDE	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
METHOXYCHLOR	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
TOXAPHENE	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
PCBs (mg/kg)						
AROCLOR-1016	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
AROCLOR-1221	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.07 U
AROCLOR-1232	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
AROCLOR-1242	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
AROCLOR-1248	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
AROCLOR-1254	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
AROCLOR-1260	0.04 U	0.04 U	0.05	0.04 U	0.04 U	0.04 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	**ELEMGB013**	**ELEMGB013**	**ELEMGB014**	**ELEMGB014**	**ELEMGB015**	**ELEMGB015**
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
PCBs (mg/kg) (Continued)						
TOTAL PCBS	0 U	0 U	0.05	0 U	0 U	0 U
PETROLEUM INDICATORS (mg/kg)						
DIESEL RANGE	12.0 U	12.0 U	11.0 U	12.0 U	12.0 U	11.0 U
GASOLINE RANGE	1.1 U	1.2 U	1.2 U	0.96 U	1.3 U	1.1 U
MOTOR OIL RANGE	59.0 U	60.0 U	57.0 U	58.0 U	58.0 U	53.0 U
TOTAL TPH	0 U	0 U	0 U	0 U	0 U	0 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB016	ELEMGB016	ELEMGB017	ELEMGB017	ELEMGB018	ELEMGB018
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
METALS (mg/kg)						
ALUMINUM	7,390	18,400	8,950	12,000	15,600	16,100
ANTIMONY	11.7 R	11.7 R	2.4 J	11.6 R	12.5 R	12.7 R
ARSENIC	5.3	6.9	5.1	6.1	7.4	6.9
BARIUM	345	88.8	81.3	100	193	260
BERYLLIUM	0.37 J	0.69	0.47 J	0.34 J	0.43 J	0.65
CADMIUM	0.59 U	0.59 U	0.58 U	0.58 U	0.62 U	0.63 U
CALCIUM	2,040	4,310	2,240	2,160	4,240	11,100
CHROMIUM	13.2	30.5	18.0	20.2	30.0	30.0
CHROMIUM VI	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
COBALT	5.6	6.2	6.3	3.4	12.2	10.7
COPPER	18.4	23.3	14.8	10.6	38.8	15.5
IRON	15,900	19,300	17,600	16,300	26,800	21,600
LEAD	6.3	13.3	9.4	6.3	9.9	7.9
MAGNESIUM	2,800	3,890	4,400	2,630	6,020	4,550
MANGANESE	139	136	197	252	542	380
MERCURY	0.12 U	0.12 U	0.12 U	0.12 U	0.19	0.06 J
MOLYBDENUM	5.9 UJ	5.9 UJ	5.8 UJ	5.8 UJ	6.2 UJ	6.3 UJ
NICKEL	17.1	29.8	19.5	12.3	35.2	45.4
SELENIUM	0.62 UJ	1.0 UJ	0.85 UJ	0.88 UJ	1.3 UJ	0.94 UJ
SILVER	2.4 U	2.4 U	2.3 U	2.3 U	2.5 U	2.5 U
SODIUM	135 J	415 J	140 J	140 J	196 J	250 J
THALLIUM	1.2 U	1.2 U	1.2 U	1.2 U	1.3 U	1.3 U
VANADIUM	21.3	42.0	25.4	29.5	51.0	45.5
ZINC	43.6	33.5	56.1	29.1	72.6	38.0
VOLATILE ORGANIC COMPOUNDS 8260 (mg/kg)						
1,1,1-TRICHLOROETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,1,2,2-TETRACHLOROETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,1,2-TRICHLOROETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,1-DICHLOROETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,1-DICHLOROETHENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB016	ELEMGB016	ELEMGB017	ELEMGB017	ELEMGB018	ELEMGB018
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
VOLATILE ORGANIC COMPOUNDS 8260 (mg/kg) (Continued)						
1,2-DICHLOROETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,2-DICHLOROETHENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,2-DICHLOROPROPANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
2-BUTANONE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
2-HEXANONE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
4-METHYL-2-PENTANONE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
ACETONE	0.08 UJ	0.06 UJ	0.02 UJ	0.05 UJ	0.1 UJ	0.04 UJ
BENZENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
BROMODICHLOROMETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
BROMOFORM	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
BROMOMETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CARBON DISULFIDE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CARBON TETRACHLORIDE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CHLOROBENZENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CHLOROETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CHLOROFORM	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CHLOROMETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CIS-1,3-DICHLOROPROPENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
DIBROMOCHLOROMETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
ETHYLBENZENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
METHYLENE CHLORIDE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
STYRENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TETRACHLOROETHENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TOLUENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TRANS-1,3-DICHLOROPROPENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TRICHLOROETHENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
VINYL ACETATE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
VINYL CHLORIDE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
XYLENE (TOTAL)	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TOTAL VOCS 8260	0 U	0 U	0 U	0 U	0 U	0 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB016	ELEMGB016	ELEMGB017	ELEMGB017	ELEMGB018	ELEMGB018
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SEMIVOLATILE ORGANIC COMPOUNDS (mg/kg)						
BENZO(A)ANTHRACENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
BENZO(A)PYRENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
BENZO(B)FLUORANTHENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
BENZO(G,H,I)PERYLENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
BENZO(K)FLUORANTHENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
DIBENZ(A,H)ANTHRACENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
FLUORANTHENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
FLUORENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
INDENO(1,2,3-CD)PYRENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
PYRENE	0.04 UJ	0.04 UJ	0.04 UJ	0.04 UJ	0.04 U	0.04 U
TOTAL SVOCS	0 U	0 U	0 U	0 U	0 U	0 U
SEMIVOLATILE ORGANIC COMPOUNDS 8270 (mg/kg)						
1,2,4-TRICHLOROBENZENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,2-DICHLOROBENZENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,3-DICHLOROBENZENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,4-DICHLOROBENZENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
2,2'-OXYBIS(1-CHLOROPROPANE)	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ
2,4,5-TRICHLOROPHENOL	1 U	1 U	1 U	1 U	1 U	1 U
2,4,6-TRICHLOROPHENOL	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
2,4-DICHLOROPHENOL	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
2,4-DIMETHYLPHENOL	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
2,4-DINITROPHENOL	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
2,4-DINITROTOLUENE	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ
2,6-DINITROTOLUENE	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ
2-CHLORONAPHTHALENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
2-CHLOROPHENOL	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
2-METHYLNAPHTHALENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
2-METHYLPHENOL	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
2-NITROANILINE	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
2-NITROPHENOL	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB016	ELEMGB016	ELEMGB017	ELEMGB017	ELEMGB018	ELEMGB018
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SEMIVOLATILE ORGANIC COMPOUNDS 8270 (mg/kg) (Continued)						
3,3'-DICHLOROBENZIDINE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
3-NITROANILINE	1 U	1 U	1 U	1 U	1 U	1 U
4,6-DINITRO-2-METHYLPHENOL	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
4-BROMOPHENYL-PHENYL ETHER	1 U	1 U	1 U	1 U	1 U	1 U
4-CHLORO-3-METHYLPHENOL	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
4-CHLOROANILINE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
4-CHLOROPHENYL-PHENYL ETHER	1 U	1 U	1 U	1 U	1 U	1 U
4-METHYLPHENOL	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
4-NITROANILINE	0.9 U	0.9 U	0.9 U	0.9 U	1 U	1 U
4-NITROPHENOL	0.9 U	0.9 U	0.9 U	0.9 U	1 U	1 U
ACENAPHTHENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
ACENAPHTHYLENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
ANTHRACENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
BIS(2-CHLOROETHOXY)METHANE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
BIS(2-CHLOROETHYL)ETHER	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
BIS(2-ETHYLHEXYL)PHTHALATE	0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 UJ	0.2 U
BUTYLBENZYLPHTHALATE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
CARBAZOLE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
CHRYSENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
DI-N-BUTYLPHTHALATE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
DI-N-OCTYLPHTHALATE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
DIBENZOFURAN	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
DIETHYLPHTHALATE	4 UJ	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
DIMETHYLPHTHALATE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
HEXACHLOROBENZENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
HEXACHLOROBUTADIENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
HEXACHLOROCYCLOPENTADIENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
HEXACHLOROETHANE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
ISOPHORONE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
N-NITROSO-DI-N-PROPYLAMINE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
N-NITROSODIPHENYLAMINE (1)	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB016	ELEMGB016	ELEMGB017	ELEMGB017	ELEMGB018	ELEMGB018
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SEMIVOLATILE ORGANIC COMPOUNDS 8270 (mg/kg) (Continued)						
NAPHTHALENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
NITROBENZENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
PENTACHLOROPHENOL	1 U	1 U	1 U	1 U	1 U	1 U
PHENANTHRENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
PHENOL	0.4 U	0.4 U	3	4	3	2
TOTAL SVOCS 8270	0 U	0 U	3	4	3	2
PESTICIDES (mg/kg)						
4,4'-DDD	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
4,4'-DDE	0.004 U	0.004 U	0.004 U	0.004 U	0.01	0.004 U
4,4'-DDT	0.004 U	0.004 U	0.004 U	0.004 U	0.002 J	0.004 U
ALDRIN	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
ALPHA-BHC	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
ALPHA-CHLORDANE	0.002 U	0.002 U	0.02 J	0.002 U	0.002 U	0.002 U
DIELDRIN	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
ENDRIN	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
GAMMA-BHC (LINDANE)	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
GAMMA-CHLORDANE	0.002 U	0.002 U	0.007	0.002 UJ	0.002 U	0.002 UJ
HEPTACHLOR	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
HEPTACHLOR EPOXIDE	0.002 U	0.002 U	0.002 UJ	0.002 U	0.002 U	0.002 U
METHOXYCHLOR	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
TOXAPHENE	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
PCBs (mg/kg)						
AROCLOR-1016	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
AROCLOR-1221	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.09 U
AROCLOR-1232	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
AROCLOR-1242	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
AROCLOR-1248	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
AROCLOR-1254	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
AROCLOR-1260	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	**ELEMGB016**	**ELEMGB016**	**ELEMGB017**	**ELEMGB017**	**ELEMGB018**	**ELEMGB018**
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
PCBs (mg/kg) (Continued)						
TOTAL PCBS	0 U	0 U	0 U	0 U	0 U	0 U
PETROLEUM INDICATORS (mg/kg)						
DIESEL RANGE	12.0 U	12.0 U	12.0 U	12.0 U	12.0 U	13.0 U
GASOLINE RANGE	1.0 U	0.97 U	0.96 U	0.92 U	1.1 U	1.0 U
MOTOR OIL RANGE	59.0 U	59.0 U	58.0 U	58.0 U	62.0 U	63.0 U
TOTAL TPH	0 U	0 U	0 U	0 U	0 U	0 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB019	ELEMGB019	ELEMGB020	ELEMGB020	ELEMGB021	ELEMGB021
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
METALS (mg/kg)						
ALUMINUM	15,600	15,100	20,200	18,100	18,800	22,400
ANTIMONY	12.7 R	12.0 R	14.7 R	12.0 R	12.2 R	2.8 J
ARSENIC	6.0	7.2	7.5	7.2	7.0	8.6
BARIUM	173	180	220	186	140	140
BERYLLIUM	0.41 J	0.59 J	0.47 J	0.69	0.44 J	0.67
CADMIUM	0.64 U	0.60 U	0.73 U	0.60 U	0.61 U	0.61 U
CALCIUM	3,370	10,200	4,120	5,660	6,560	3,730
CHROMIUM	28.7	25.7	35.9	33.2	29.5	38.4
CHROMIUM VI	0.01 U	0.01 U	0.02 U	0.01 U	0.01 U	0.01 U
COBALT	10.8	12.4	14.5	9.4	15.3	25.5
COPPER	38.0	21.7	43.3	25.9	32.5	17.9
IRON	25,600	19,600	31,200	20,700	30,400	25,000
LEAD	8.8	23.0	9.0	23.7	7.9	9.7
MAGNESIUM	5,760	3,570	7,140	3,660	8,330	4,640
MANGANESE	392	488	676	361	500	915
MERCURY	0.10 J	0.22	0.05 J	0.08 J	0.12 U	0.12 U
MOLYBDENUM	6.4 UJ	6.0 UJ	7.3 UJ	6.0 UJ	6.1 UJ	6.1 UJ
NICKEL	32.0	31.1	39.3	31.2	41.8	60.4
SELENIUM	1.3 UJ	0.87 UJ	1.9 UJ	0.79 UJ	1.9 UJ	1.5 UJ
SILVER	2.6 U	2.4 U	2.9 U	2.4 U	2.4 U	2.4 U
SODIUM	203 J	237 J	249 J	390	744 J	979 J
THALLIUM	0.55 UJ	1.2 U	1.5 U	1.2 U	0.42 UJ	0.76 UJ
VANADIUM	49.3	37.4	61.4	46.5	71.7	50.9
ZINC	68.6	138	86.2	184	63.9	40.0
VOLATILE ORGANIC COMPOUNDS 8260 (mg/kg)						
1,1,1-TRICHLOROETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,1,2,2-TETRACHLOROETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,1,2-TRICHLOROETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,1-DICHLOROETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,1-DICHLOROETHENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB019	ELEMGB019	ELEMGB020	ELEMGB020	ELEMGB021	ELEMGB021
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
VOLATILE ORGANIC COMPOUNDS 8260 (mg/kg) (Continued)						
1,2-DICHLOROETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,2-DICHLOROETHENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
1,2-DICHLOROPROPANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
2-BUTANONE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
2-HEXANONE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
4-METHYL-2-PENTANONE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
ACETONE	0.04 UJ	0.06 UJ	0.07 UJ	0.05 UJ	0.02 UJ	0.01 UJ
BENZENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
BROMODICHLOROMETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
BROMOFORM	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
BROMOMETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CARBON DISULFIDE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CARBON TETRACHLORIDE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CHLOROBENZENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CHLOROETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CHLOROFORM	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CHLOROMETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CIS-1,3-DICHLOROPROPENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
DIBROMOCHLOROMETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
ETHYLBENZENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
METHYLENE CHLORIDE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
STYRENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TETRACHLOROETHENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TOLUENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TRANS-1,3-DICHLOROPROPENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TRICHLOROETHENE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
VINYL ACETATE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
VINYL CHLORIDE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
XYLENE (TOTAL)	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
TOTAL VOCS 8260	0 U	0 U	0 U	0 U	0 U	0 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB019	ELEMGB019	ELEMGB020	ELEMGB020	ELEMGB021	ELEMGB021
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SEMIVOLATILE ORGANIC COMPOUNDS (mg/kg)						
BENZO(A)ANTHRACENE	0.04 U	0.04 U	0.05 U	0.04 U	0.04 U	0.04 U
BENZO(A)PYRENE	0.04 U	0.04 U	0.05 U	0.04 U	0.04 U	0.04 U
BENZO(B)FLUORANTHENE	0.04 U	0.04 U	0.05 U	0.04 U	0.04 U	0.04 U
BENZO(G,H,I)PERYLENE	0.04 U	0.04 U	0.05 U	0.04 U	0.04 U	0.04 U
BENZO(K)FLUORANTHENE	0.04 U	0.04 U	0.05 U	0.04 U	0.04 U	0.04 U
DIBENZ(A,H)ANTHRACENE	0.04 U	0.04 U	0.05 U	0.04 U	0.04 U	0.04 U
FLUORANTHENE	0.04 U	0.04 U	0.05 U	0.04 U	0.04 U	0.04 U
FLUORENE	0.04 U	0.04 U	0.05 U	0.04 U	0.04 U	0.04 U
INDENO(1,2,3-CD)PYRENE	0.04 U	0.04 U	0.05 U	0.04 U	0.04 U	0.04 U
PYRENE	0.04 UJ	0.04 UJ	0.05 UJ	0.04 U	0.04 U	0.04 U
TOTAL SVOCS	0 U	0 U	0 U	0 U	0 U	0 U
SEMIVOLATILE ORGANIC COMPOUNDS 8270 (mg/kg)						
1,2,4-TRICHLOROBENZENE	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
1,2-DICHLOROBENZENE	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
1,3-DICHLOROBENZENE	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
1,4-DICHLOROBENZENE	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
2,2'-OXYBIS(1-CHLOROPROPANE)	0.4 UJ	0.4 UJ	0.5 UJ	0.4 UJ	0.4 UJ	0.4 UJ
2,4,5-TRICHLOROPHENOL	1 U	1 U	1 U	1 U	1 U	1 U
2,4,6-TRICHLOROPHENOL	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
2,4-DICHLOROPHENOL	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
2,4-DIMETHYLPHENOL	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
2,4-DINITROPHENOL	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
2,4-DINITROTOLUENE	0.4 UJ	0.4 UJ	0.5 UJ	0.4 UJ	0.4 UJ	0.4 UJ
2,6-DINITROTOLUENE	0.4 UJ	0.4 UJ	0.5 UJ	0.4 UJ	0.4 UJ	0.4 UJ
2-CHLORONAPHTHALENE	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
2-CHLOROPHENOL	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
2-METHYLNAPHTHALENE	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
2-METHYLPHENOL	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
2-NITROANILINE	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
2-NITROPHENOL	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB019	ELEMGB019	ELEMGB020	ELEMGB020	ELEMGB021	ELEMGB021
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SEMIVOLATILE ORGANIC COMPOUNDS 8270 (mg/kg) (Continued)						
3,3'-DICHLOROBENZIDINE	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
3-NITROANILINE	1 U	1 U	1 U	1 U	1 U	1 U
4,6-DINITRO-2-METHYLPHENOL	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
4-BROMOPHENYL-PHENYL ETHER	1 U	1 U	1 U	1 U	1 U	1 U
4-CHLORO-3-METHYLPHENOL	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
4-CHLOROANILINE	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
4-CHLOROPHENYL-PHENYL ETHER	1 U	1 U	1 U	1 U	1 U	1 U
4-METHYLPHENOL	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
4-NITROANILINE	1 U	1 U	1 U	1 U	1 U	1 U
4-NITROPHENOL	1 U	1 U	1 U	1 U	1 U	1 U
ACENAPHTHENE	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
ACENAPHTHYLENE	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
ANTHRACENE	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
BIS(2-CHLOROETHOXY)METHANE	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
BIS(2-CHLOROETHYL)ETHER	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
BIS(2-ETHYLHEXYL)PHTHALATE	0.2 UJ	0.2 U	0.3 UJ	0.2 U	0.3 UJ	0.2 U
BUTYLBENZYLPHTHALATE	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
CARBAZOLE	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
CHRYSENE	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
DI-N-BUTYLPHTHALATE	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
DI-N-OCTYLPHTHALATE	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
DIBENZOFURAN	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
DIETHYLPHTHALATE	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
DIMETHYLPHTHALATE	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
HEXACHLOROBENZENE	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
HEXACHLOROBUTADIENE	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
HEXACHLOROCYCLOPENTADIENE	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
HEXACHLOROETHANE	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
ISOPHORONE	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
N-NITROSO-DI-N-PROPYLAMINE	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
N-NITROSODIPHENYLAMINE (1)	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB019	ELEMGB019	ELEMGB020	ELEMGB020	ELEMGB021	ELEMGB021
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SEMIVOLATILE ORGANIC COMPOUNDS 8270 (mg/kg)						
NAPHTHALENE	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
NITROBENZENE	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
PENTACHLOROPHENOL	1 U	1 U	1 U	1 U	1 U	1 U
PHENANTHRENE	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U
PHENOL	0.8	3	1	0.4 U	0.4 U	0.4 U
TOTAL SVOCS 8270	0.8	3	1	0 U	0 U	0 U
PESTICIDES (mg/kg)						
4,4'-DDD	0.002 J	0.004 U	0.005 U	0.03	0.004 U	0.004 U
4,4'-DDE	0.01	0.004 U	0.005 U	0.03	0.004 U	0.004 U
4,4'-DDT	0.005	0.004 U	0.005 U	0.01	0.004 U	0.004 U
ALDRIN	0.002 U	0.002 U	0.003 U	0.002 U	0.002 U	0.002 U
ALPHA-BHC	0.002 UJ	0.002 U	0.003 U	0.002 U	0.002 U	0.002 U
ALPHA-CHLORDANE	0.002 U	0.01 J	0.003 U	0.07 J	0.002 U	0.002 U
DIELDRIN	0.004 U	0.004 U	0.005 U	0.004 U	0.004 U	0.004 U
ENDRIN	0.004 U	0.004 U	0.005 U	0.004 U	0.004 U	0.004 U
GAMMA-BHC (LINDANE)	0.002 U	0.002 U	0.003 U	0.002 U	0.002 U	0.002 U
GAMMA-CHLORDANE	0.002 U	0.003	0.003 U	0.03	0.002 U	0.002 J
HEPTACHLOR	0.002 U	0.002 U	0.003 U	0.002 U	0.002 U	0.002 U
HEPTACHLOR EPOXIDE	0.002 U	0.002 UJ	0.003 U	0.002	0.002 U	0.002 U
METHOXYCHLOR	0.02 U	0.02 U	0.03 U	0.02 U	0.02 U	0.02 U
TOXAPHENE	0.2 U	0.2 U	0.3 U	0.2 U	0.2 U	0.2 U
PCBs (mg/kg)						
AROCLOR-1016	0.04 U	0.04 U	0.05 U	0.04 U	0.04 U	0.04 U
AROCLOR-1221	0.09 U	0.08 U	0.1 U	0.08 U	0.08 U	0.08 U
AROCLOR-1232	0.04 U	0.04 U	0.05 U	0.04 U	0.04 U	0.04 U
AROCLOR-1242	0.04 U	0.04 U	0.05 U	0.04 U	0.04 U	0.04 U
AROCLOR-1248	0.04 U	0.04 U	0.05 U	0.04 U	0.04 U	0.04 U
AROCLOR-1254	0.04 U	0.04 U	0.05 U	0.04 U	0.04 U	0.04 U
AROCLOR-1260	0.04 U	0.04 U	0.05 U	0.04 U	0.04 U	0.04 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	**ELEMGB019**	**ELEMGB019**	**ELEMGB020**	**ELEMGB020**	**ELEMGB021**	**ELEMGB021**
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002	11/24/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
PCBs (mg/kg) (Continued)						
TOTAL PCBS	0 U	0 U	0 U	0 U	0 U	0 U
PETROLEUM INDICATORS (mg/kg)						
DIESEL RANGE	13.0 U	12.0 U	15.0 U	12.0 U	12.0 U	12.0 U
GASOLINE RANGE	1.0 U	0.95 U	1.4 U	1.1 U	1.2 U	1.1 U
MOTOR OIL RANGE	64.0 U	60.0 U	73.0 U	60.0 U	25.0 L	61.0 U
TOTAL TPH	0 U	0 U	0 U	0 U	25.0 L	0 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB022	ELEMGB022	ELEMGB023	ELEMGB023	ELEMGB024	ELEMGB024
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/25/2002	11/25/2002	11/25/2002	11/25/2002	11/25/2002	11/25/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
METALS (mg/kg)						
ALUMINUM	20,300	15,200	23,000	22,600	21,300	27,300
ANTIMONY	3.9 J	11.6 R	3.0 J	2.8 J	3.1 J	5.6 J
ARSENIC	6.7	8.2	8.2	10.4	9.5	5.4
BARIUM	168 J	133 J	185 J	431 J	211 J	182 J
BERYLLIUM	0.58 J	0.62	0.60 J	0.71	0.53 J	0.71
CADMIUM	0.62 U	0.58 U	0.62 U	0.62 U	0.60 U	0.57 U
CALCIUM	19,700	12,400	18,200	115,000	5,300	20,900
CHROMIUM	43.0	46.4	49.0	35.8	38.3	111
CHROMIUM VI	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
COBALT	8.6	8.7	10.8	4.7	12.7	22.7
COPPER	27.4	42.8	36.5	19.8	38.4	61.7
IRON	21,900	22,400	26,600	19,600	**28,600**	34,000
LEAD	17.4	31.3	13.3	6.5	12.2	7.4
MAGNESIUM	5,940	4,840	7,360	7,140	6,350	18,400
MANGANESE	403 J	298 J	555 J	107 J	594 J	1,390 J
MERCURY	0.11 J	0.27	0.16	0.12 U	0.05 J	0.04 J
MOLYBDENUM	6.2 UJ	5.8 UJ	6.2 UJ	6.2 UJ	6.0 UJ	5.7 UJ
NICKEL	37.3	68.6	46.3	31.2	39.8	136
SELENIUM	0.91 UJ	1.2 UJ	1.3 UJ	1.2 U	1.7 UJ	1.6 UJ
SILVER	2.5 U	2.3 U	2.5 U	2.5 U	2.4 U	2.3 U
SODIUM	204	133	296	255	136	294
THALLIUM	1.2 U	0.69 UJ	0.94 UJ	1.2 U	0.87 UJ	0.56 UJ
VANADIUM	44.6	37.6	55.5	52.2	59.0	63.6
ZINC	102 J	91.5 J	95.2 J	39.5 J	82.7 J	71.4 J
VOLATILE ORGANIC COMPOUNDS 8260 (mg/kg)						
1,1,1-TRICHLOROETHANE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
1,1,2,2-TETRACHLOROETHANE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
1,1,2-TRICHLOROETHANE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
1,1-DICHLOROETHANE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
1,1-DICHLOROETHENE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB022	ELEMGB022	ELEMGB023	ELEMGB023	ELEMGB024	ELEMGB024
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/25/2002	11/25/2002	11/25/2002	11/25/2002	11/25/2002	11/25/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
VOLATILE ORGANIC COMPOUNDS 8260 (mg/kg) (Continued)						
1,2-DICHLOROETHANE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
1,2-DICHLOROETHENE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
1,2-DICHLOROPROPANE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
2-BUTANONE	0.02	0.01 U	0.03	0.01 U	0.02 UJ	0.01 U
2-HEXANONE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
4-METHYL-2-PENTANONE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
ACETONE	0.2	0.06	0.4	0.03 UJ	0.3	0.05
BENZENE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
BROMODICHLOROMETHANE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
BROMOFORM	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
BROMOMETHANE	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CARBON DISULFIDE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.003 J
CARBON TETRACHLORIDE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
CHLOROBENZENE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
CHLOROETHANE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
CHLOROFORM	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
CHLOROMETHANE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
CIS-1,3-DICHLOROPROPENE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
DIBROMOCHLOROMETHANE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
ETHYLBENZENE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
METHYLENE CHLORIDE	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 UJ
STYRENE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
TETRACHLOROETHENE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
TOLUENE	0.003 J	0.01 U	0.02	0.01 U	0.03	0.01 U
TRANS-1,3-DICHLOROPROPENE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
TRICHLOROETHENE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
VINYL ACETATE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
VINYL CHLORIDE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
XYLENE (TOTAL)	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
TOTAL VOCS 8260	0.2 J	0.06	0.4	0 U	0.3	0.05 J

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB022	ELEMGB022	ELEMGB023	ELEMGB023	ELEMGB024	ELEMGB024
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/25/2002	11/25/2002	11/25/2002	11/25/2002	11/25/2002	11/25/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SEMIVOLATILE ORGANIC COMPOUNDS (mg/kg)						
BENZO(A)ANTHRACENE	0.04 U	0.08 U	0.04 U	0.04 U	0.04 U	0.04 U
BENZO(A)PYRENE	0.04 U	0.08 U	0.04 U	0.04 U	0.04 U	0.04 U
BENZO(B)FLUORANTHENE	0.04 U	0.08 U	0.04 U	0.04 U	0.04 U	0.04 U
BENZO(G,H,I)PERYLENE	0.04 U	0.08 U	0.04 U	0.04 U	0.04 U	0.04 U
BENZO(K)FLUORANTHENE	0.04 U	0.08 U	0.04 U	0.04 U	0.04 U	0.04 U
DIBENZ(A,H)ANTHRACENE	0.04 U	0.08 U	0.04 U	0.04 U	0.04 U	0.04 U
FLUORANTHENE	0.04 U	0.08 U	0.04 U	0.04 U	0.04 U	0.04 U
FLUORENE	0.04 U	0.08 U	0.04 U	0.04 U	0.04 U	0.04 U
INDENO(1,2,3-CD)PYRENE	0.04 U	0.08 U	0.04 U	0.04 U	0.04 U	0.04 U
PYRENE	0.04 U	0.08 U	0.04 U	0.04 U	0.04 U	0.04 U
TOTAL SVOCS	0 U	0 U	0 U	0 U	0 U	0 U
SEMIVOLATILE ORGANIC COMPOUNDS 8270 (mg/kg)						
1,2,4-TRICHLOROBENZENE	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
1,2-DICHLOROBENZENE	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
1,3-DICHLOROBENZENE	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
1,4-DICHLOROBENZENE	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
2,2'-OXYBIS(1-CHLOROPROPANE)	0.4 UJ	0.8 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ
2,4,5-TRICHLOROPHENOL	1 U	2 U	1 U	1 U	1 U	1 U
2,4,6-TRICHLOROPHENOL	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
2,4-DICHLOROPHENOL	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
2,4-DIMETHYLPHENOL	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
2,4-DINITROPHENOL	1 UJ	2 UJ	1 UJ	1 UJ	1 UJ	1 UJ
2,4-DINITROTOLUENE	0.4 UJ	0.8 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ
2,6-DINITROTOLUENE	0.4 UJ	0.8 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ
2-CHLORONAPHTHALENE	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
2-CHLOROPHENOL	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
2-METHYLNAPHTHALENE	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
2-METHYLPHENOL	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
2-NITROANILINE	1 UJ	2 UJ	1 UJ	1 UJ	1 UJ	1 UJ
2-NITROPHENOL	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB022	ELEMGB022	ELEMGB023	ELEMGB023	ELEMGB024	ELEMGB024
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/25/2002	11/25/2002	11/25/2002	11/25/2002	11/25/2002	11/25/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SEMIVOLATILE ORGANIC COMPOUNDS 8270 (mg/kg) (Continued)						
3,3'-DICHLOROBENZIDINE	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
3-NITROANILINE	1 U	2 U	1 U	1 U	1 U	1 U
4,6-DINITRO-2-METHYLPHENOL	1 UJ	2 UJ	1 UJ	1 UJ	1 UJ	1 UJ
4-BROMOPHENYL-PHENYL ETHER	1 U	2 U	1 U	1 U	1 U	1 U
4-CHLORO-3-METHYLPHENOL	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
4-CHLOROANILINE	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
4-CHLOROPHENYL-PHENYL ETHER	1 U	2 U	1 U	1 U	1 U	1 U
4-METHYLPHENOL	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
4-NITROANILINE	1 U	2 U	1 U	1 U	1 U	0.9 U
4-NITROPHENOL	1 U	2 U	1 U	1 U	1 U	0.9 U
ACENAPHTHENE	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
ACENAPHTHYLENE	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
ANTHRACENE	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
BIS(2-CHLOROETHOXY)METHANE	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
BIS(2-CHLOROETHYL)ETHER	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
BIS(2-ETHYLHEXYL)PHTHALATE	0.9 UJ	0.4 UJ	0.3 UJ	0.2 U	0.4 UJ	0.2 UJ
BUTYLBENZYLPHTHALATE	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
CARBAZOLE	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
CHRYSENE	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
DI-N-BUTYLPHTHALATE	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
DI-N-OCTYLPHTHALATE	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
DIBENZOFURAN	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
DIETHYLPHTHALATE	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
DIMETHYLPHTHALATE	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
HEXACHLOROBENZENE	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
HEXACHLOROBUTADIENE	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
HEXACHLOROCYCLOPENTADIENE	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
HEXACHLOROETHANE	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
ISOPHORONE	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
N-NITROSO-DI-N-PROPYLAMINE	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
N-NITROSODIPHENYLAMINE (1)	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB022	ELEMGB022	ELEMGB023	ELEMGB023	ELEMGB024	ELEMGB024
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/25/2002	11/25/2002	11/25/2002	11/25/2002	11/25/2002	11/25/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SEMIVOLATILE ORGANIC COMPOUNDS 8270 (mg/kg) (Continued)						
NAPHTHALENE	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
NITROBENZENE	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
PENTACHLOROPHENOL	1 U	2 U	1 U	1 U	1 U	1 U
PHENANTHRENE	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
PHENOL	0.4 U	0.8 U	0.4 U	0.4 U	0.4 U	0.4 U
TOTAL SVOCS 8270	0 U	0 U	0 U	0 U	0 U	0 U
PESTICIDES (mg/kg)						
4,4'-DDD	0.01	0.004 U	0.03	0.004 U	0.01	0.004 U
4,4'-DDE	0.04 J	0.004 U	0.02 J	0.004 U	0.05	0.004 U
4,4'-DDT	0.004 U	0.007	0.02 J	0.004 U	0.02 J	0.004 U
ALDRIN	0.003	0.002 U	0.005	0.002 U	0.003	0.002 U
ALPHA-BHC	0.002 U	0.002 U	0.002 U	0.002 U	0.003 J	0.002 U
ALPHA-CHLORDANE	0.002 U	0.004 J	0.003 J	0.002 U	0.002	0.002 U
DIELDRIN	0.004 U	0.003 J	0.01	0.004 U	0.009 J	0.004 U
ENDRIN	0.004 U	0.004 U	0.004 U	0.004 U	0.009 J	0.004 U
GAMMA-BHC (LINDANE)	0.002 U	0.002 U	0.002 U	0.002 U	0.001 J	0.002 U
GAMMA-CHLORDANE	0.002 U	0.003	0.002 U	0.002 U	0.002 U	0.002 U
HEPTACHLOR	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
HEPTACHLOR EPOXIDE	0.002 U	0.002 U	0.005 J	0.002 U	0.002	0.002 U
METHOXYCHLOR	0.02 U	0.02 U	0.02 U	0.02 U	0.06 J	0.02 U
TOXAPHENE	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
PCBs (mg/kg)						
AROCLOR-1016	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
AROCLOR-1221	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U
AROCLOR-1232	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
AROCLOR-1242	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
AROCLOR-1248	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
AROCLOR-1254	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
AROCLOR-1260	0.04 U	0.05	0.04 U	0.04 U	0.04 U	0.04 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	**ELEMGB022**	**ELEMGB022**	**ELEMGB023**	**ELEMGB023**	**ELEMGB024**	**ELEMGB024**
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/25/2002	11/25/2002	11/25/2002	11/25/2002	11/25/2002	11/25/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
PCBs (mg/kg) (Continued)						
TOTAL PCBS	0 U	0.05	0 U	0 U	0 U	0 U
PETROLEUM INDICATORS (mg/kg)						
DIESEL RANGE	12.0 U	12.0 U	12.0 U	12.0 U	12.0 U	11.0 U
GASOLINE RANGE	1.6 Z	1.1 U	2.1 Z	1.3 U	6.5 Z	0.98 U
MOTOR OIL RANGE	49.0 J	42.0 J	50.0 J	62.0 U	60.0 U	57.0 U
TOTAL TPH	49.0 J	42.0 J	50.0 J	0 U	0 U	0 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB025	ELEMGB025	ELEMGB026	ELEMGB026	ELEMGB027	ELEMGB027
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/25/2002	11/25/2002	11/25/2002	11/25/2002	11/25/2002	11/25/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
METALS (mg/kg)						
ALUMINUM	21,200	21,500	19,700	23,900	7,260	17,200
ANTIMONY	11.6 R	4.2 J	2.8 J	2.8 J	2.4 J	3.7 J
ARSENIC	**6**.6	4.5	7.3	7.6	1.9	4.1
BARIUM	184 J	74.8 J	166 J	139 J	58.7 J	105 J
BERYLLIUM	0.51 J	0.43 J	0.54 J	0.60	0.23 J	0.41 J
CADMIUM	0.58 U	0.56 U	0.56 U	0.59 U	0.53 U	0.56 U
CALCIUM	21,400	24,500	11,500	9,120	2,920	14,500
CHROMIUM	29.1	21.6	34.4	35.5	13.2	24.4
CHROMIUM VI	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
COBALT	17.3	12.6	10.3	13.7	3.1	9.7
COPPER	38.3	36.7	26.2	28.2	9.5	22.3
IRON	32,600	39,100	25,600	28,000	8,380	24,300
LEAD	9.5	4.6	12.2	14.8	4.7	8.1
MAGNESIUM	8,400	11,200	5,980	6,620	2,320	7,640
MANGANESE	610 J	451 J	387 J	448 J	144 J	338 J
MERCURY	0.04 J	0.21	0.05 J	0.17	0.11 U	0.21
MOLYBDENUM	5.8 UJ	5.6 UJ	5.6 UJ	5.9 UJ	5.3 UJ	5.6 UJ
NICKEL	37.7	18.7	33.8	29.9	11.1	27.7
SELENIUM	1.8 UJ	1.9 UJ	1.2 UJ	1.6 UJ	0.72 UJ	1.2 UJ
SILVER	2.3 U	2.2 U	2.3 U	2.4 U	2.1 U	2.2 U
SODIUM	394	2,310	287	1,290	120	1,140
THALLIUM	1.2 U	0.97 UJ	1.1 U	1.2 U	0.33 UJ	1.1 U
VANADIUM	78.9	101	52.2	64.1	19.9	61.0
ZINC	161 J	77.4 J	78.9 J	71.7 J	36.5 J	56.4 J
VOLATILE ORGANIC COMPOUNDS 8260 (mg/kg)						
1,1,1-TRICHLOROETHANE	0.01 U	0.01 U	0.009 U	0.01 U	0.01 U	0.01 U
1,1,2,2-TETRACHLOROETHANE	0.01 U	0.01 U	0.009 U	0.01 U	0.01 U	0.01 U
1,1,2-TRICHLOROETHANE	0.01 U	0.01 U	0.009 U	0.01 U	0.01 U	0.01 U
1,1-DICHLOROETHANE	0.01 U	0.01 U	0.009 U	0.01 U	0.01 U	0.01 U
1,1-DICHLOROETHENE	0.01 U	0.01 U	0.009 U	0.01 U	0.01 U	0.01 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB025	ELEMGB025	ELEMGB026	ELEMGB026	ELEMGB027	ELEMGB027
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/25/2002	11/25/2002	11/25/2002	11/25/2002	11/25/2002	11/25/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
VOLATILE ORGANIC COMPOUNDS 8260 (mg/kg) (Continued)						
1,2-DICHLOROETHANE	0.01 U	0.01 U	0.009 U	0.01 U	0.01 U	0.01 U
1,2-DICHLOROETHENE	0.01 U	0.01 U	0.009 U	0.01 U	0.01 U	0.01 U
1,2-DICHLOROPROPANE	0.01 U	0.01 U	0.009 U	0.01 U	0.01 U	0.01 U
2-BUTANONE	0.01 U	0.01 U	0.009 U	0.01 U	0.01 U	0.01 U
2-HEXANONE	0.01 U	0.01 U	0.009 U	0.01 U	0.01 U	0.01 U
4-METHYL-2-PENTANONE	0.01 U	0.01 U	0.009 U	0.01 U	0.01 U	0.01 U
ACETONE	0.09	0.04 UJ	0.07	0.06	0.05 UJ	0.07
BENZENE	0.01 U	0.01 U	0.009 U	0.01 U	0.01 U	0.01 U
BROMODICHLOROMETHANE	0.01 U	0.01 U	0.009 U	0.01 U	0.01 U	0.01 U
BROMOFORM	0.01 U	0.01 U	0.009 U	0.01 U	0.01 U	0.01 U
BROMOMETHANE	0.01 UJ	0.01 UJ	0.009 UJ	0.01 UJ	0.01 UJ	0.01 UJ
CARBON DISULFIDE	0.01 U	0.01 U	0.009 U	0.01 U	0.01 U	0.004 J
CARBON TETRACHLORIDE	0.01 U	0.01 U	0.009 U	0.01 U	0.01 U	0.01 U
CHLOROBENZENE	0.01 U	0.01 U	0.009 U	0.01 U	0.01 U	0.01 U
CHLOROETHANE	0.01 U	0.01 U	0.009 U	0.01 U	0.01 U	0.01 U
CHLOROFORM	0.01 U	0.01 U	0.009 U	0.01 U	0.01 U	0.01 U
CHLOROMETHANE	0.01 U	0.01 U	0.009 U	0.01 U	0.01 U	0.01 U
CIS-1,3-DICHLOROPROPENE	0.01 U	0.01 U	0.009 U	0.01 U	0.01 U	0.01 U
DIBROMOCHLOROMETHANE	0.01 U	0.01 U	0.009 U	0.01 U	0.01 U	0.01 U
ETHYLBENZENE	0.01 U	0.01 U	0.009 U	0.01 U	0.01 U	0.01 U
METHYLENE CHLORIDE	0.01 UJ	0.01 U	0.009 U	0.01 UJ	0.01 UJ	0.01 U
STYRENE	0.01 U	0.01 U	0.009 U	0.01 U	0.01 U	0.01 U
TETRACHLOROETHENE	0.01 U	0.01 U	0.009 U	0.01 U	0.01 U	0.01 U
TOLUENE	0.01 U	0.01 U	0.009 U	0.01 U	0.01 U	0.01 U
TRANS-1,3-DICHLOROPROPENE	0.01 U	0.01 U	0.009 U	0.01 U	0.01 U	0.01 U
TRICHLOROETHENE	0.01 U	0.01 U	0.009 U	0.01 U	0.01 U	0.01 U
VINYL ACETATE	0.01 U	0.01 U	0.009 U	0.01 U	0.01 U	0.01 U
VINYL CHLORIDE	0.01 U	0.01 U	0.009 U	0.01 U	0.01 U	0.01 U
XYLENE (TOTAL)	0.01 U	0.01 U	0.009 U	0.01 U	0.01 U	0.01 U
TOTAL VOCS 8260	0.09	0 U	0.07	0.06	0 U	0.07 J

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB025	ELEMGB025	ELEMGB026	ELEMGB026	ELEMGB027	ELEMGB027
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/25/2002	11/25/2002	11/25/2002	11/25/2002	11/25/2002	11/25/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SEMIVOLATILE ORGANIC COMPOUNDS (mg/kg)						
BENZO(A)ANTHRACENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
BENZO(A)PYRENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
BENZO(B)FLUORANTHENE	0.04 U	0.04 UJ	0.04 UJ	0.04 UJ	0.04 UJ	0.04 UJ
BENZO(G,H,I)PERYLENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
BENZO(K)FLUORANTHENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
DIBENZ(A,H)ANTHRACENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
FLUORANTHENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
FLUORENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
INDENO(1,2,3-CD)PYRENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
PYRENE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
TOTAL SVOCS	0 U	0 U	0 U	0 U	0 U	0 U
SEMIVOLATILE ORGANIC COMPOUNDS 8270 (mg/kg)						
1,2,4-TRICHLOROBENZENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,2-DICHLOROBENZENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,3-DICHLOROBENZENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,4-DICHLOROBENZENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
2,2'-OXYBIS(1-CHLOROPROPANE)	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ
2,4,5-TRICHLOROPHENOL	1 U	0.9 U	0.9 U	1 U	0.9 U	0.9 U
2,4,6-TRICHLOROPHENOL	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
2,4-DICHLOROPHENOL	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
2,4-DIMETHYLPHENOL	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
2,4-DINITROPHENOL	1 UJ	0.9 UJ	0.9 UJ	1 UJ	0.9 UJ	0.9 UJ
2,4-DINITROTOLUENE	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ
2,6-DINITROTOLUENE	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ
2-CHLORONAPHTHALENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
2-CHLOROPHENOL	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
2-METHYLNAPHTHALENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
2-METHYLPHENOL	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
2-NITROANILINE	1 UJ	0.9 UJ	0.9 UJ	1 UJ	0.9 UJ	0.9 UJ
2-NITROPHENOL	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB025	ELEMGB025	ELEMGB026	ELEMGB026	ELEMGB027	ELEMGB027
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/25/2002	11/25/2002	11/25/2002	11/25/2002	11/25/2002	11/25/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SEMIVOLATILE ORGANIC COMPOUNDS 8270 (mg/kg) (Continued)						
3,3'-DICHLOROBENZIDINE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
3-NITROANILINE	1 U	0.9 U	0.9 U	1 U	0.9 U	0.9 U
4,6-DINITRO-2-METHYLPHENOL	1 UJ	0.9 UJ	0.9 UJ	1 UJ	0.9 UJ	0.9 UJ
4-BROMOPHENYL-PHENYL ETHER	1 U	0.9 U	0.9 U	1 U	0.9 U	0.9 U
4-CHLORO-3-METHYLPHENOL	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
4-CHLOROANILINE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
4-CHLOROPHENYL-PHENYL ETHER	1 U	0.9 U	0.9 U	1 U	0.9 U	0.9 U
4-METHYLPHENOL	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
4-NITROANILINE	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U
4-NITROPHENOL	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U
ACENAPHTHENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
ACENAPHTHYLENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
ANTHRACENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
BIS(2-CHLOROETHOXY)METHANE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
BIS(2-CHLOROETHYL)ETHER	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
BIS(2-ETHYLHEXYL)PHTHALATE	0.4 UJ	0.2 UJ	1	0.2 U	0.5 UJ	0.3 UJ
BUTYLBENZYLPHTHALATE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 UJ	0.4 U
CARBAZOLE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
CHRYSENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
DI-N-BUTYLPHTHALATE	0.4 U	0.4 U	2 UJ	0.4 U	0.4 U	0.4 U
DI-N-OCTYLPHTHALATE	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ
DIBENZOFURAN	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
DIETHYLPHTHALATE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
DIMETHYLPHTHALATE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
HEXACHLOROBENZENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
HEXACHLOROBUTADIENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
HEXACHLOROCYCLOPENTADIENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
HEXACHLOROETHANE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
ISOPHORONE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
N-NITROSO-DI-N-PROPYLAMINE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
N-NITROSODIPHENYLAMINE (1)	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB025	ELEMGB025	ELEMGB026	ELEMGB026	ELEMGB027	ELEMGB027
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/25/2002	11/25/2002	11/25/2002	11/25/2002	11/25/2002	11/25/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SEMIVOLATILE ORGANIC COMPOUNDS 8270 (mg/kg)						
NAPHTHALENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
NITROBENZENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
PENTACHLOROPHENOL	1 U	0.9 U	0.9 U	1 U	0.9 U	0.9 U
PHENANTHRENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
PHENOL	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
TOTAL SVOCS 8270	0 U	0 U	1	0 U	0 U	0 U
PESTICIDES (mg/kg)						
4,4'-DDD	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
4,4'-DDE	0.03	0.005	0.01	0.004 U	0.009	0.007
4,4'-DDT	0.01	0.003 J	0.005	0.004 U	0.006	0.003 J
ALDRIN	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
ALPHA-BHC	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
ALPHA-CHLORDANE	0.002 U	0.004 J	0.004 J	0.009 J	0.002 U	0.002 U
DIELDRIN	0.004 U	0.004 U	0.004 U	0.004 U	0.002 J	0.004 U
ENDRIN	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
GAMMA-BHC (LINDANE)	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
GAMMA-CHLORDANE	0.002 U	0.002 J	0.002 U	0.004	0.002 U	0.002 U
HEPTACHLOR	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
HEPTACHLOR EPOXIDE	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.003 J
METHOXYCHLOR	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
TOXAPHENE	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
PCBs (mg/kg)						
AROCLOR-1016	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
AROCLOR-1221	0.08 U	0.08 U	0.08 U	0.08 U	0.07 U	0.08 U
AROCLOR-1232	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
AROCLOR-1242	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
AROCLOR-1248	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
AROCLOR-1254	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
AROCLOR-1260	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	**ELEMGB025**	**ELEMGB025**	**ELEMGB026**	**ELEMGB026**	**ELEMGB027**	**ELEMGB027**
Sample Depth (feet bgs)	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.5 - 2.0
Sample Date	11/25/2002	11/25/2002	11/25/2002	11/25/2002	11/25/2002	11/25/2002
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
PCBs (mg/kg) (Continued)						
TOTAL PCBS	0 U	0 U	0 U	0 U	0 U	0 U
PETROLEUM INDICATORS (mg/kg)						
DIESEL RANGE	12.0 U	11.0 U	11.0 U	12.0 U	11.0 U	11.0 U
GASOLINE RANGE	1.1 U	1.1 U	1.0 U	1.0 U	0.93 U	0.53 J
MOTOR OIL RANGE	58.0 U	56.0 U	27.0 J	59.0 U	53.0 U	56.0 U
TOTAL TPH	0 U	0 U	27.0 J	0 U	0 U	0.53 J

Notes to table on page B-55

TABLE B-1: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Notes: U = Not detected at given detection limit J = Estimated value H = Pattern is in the heavier hydrocarbon end of the analyte's range in the standard.

L = Pattern is in the lighter hydrocarbon end of the analyte's range in the standard. M = Pattern resembles motor oil.

R = Rejected result; laboratory did not satisfy quality assurance/quality control requirements for accuracy.

Z = Other peak(s); chromatogram does not suggest the presence of a fuel.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

TPH results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Concentrations shown in bold type are greater than the comparison criteria. Preliminary remediation goals (PRG) for residential use were used when available (EPA 2002)

Alternate criteria were used for lead and TPH (Tetra Tech 1998a; PRC 1997).

Diesel range includes hydrocarbons quantified as diesel and diesel-range unknowns.

Gasoline range includes hydrocarbons quantified as gasoline and gasoline-range unknowns. Motor oil range includes hydrocarbons quantified as motor oil and motor-oil-range unknowns.

Sources: PRC Environmental Management, Inc. (PRC). 1997. "Draft Final Group II and III Accelerated Study Field Sampling and Analysis Plan, Mare Island." August 5.

Tetra Tech EM Inc. (Tetra Tech). 1998a. "Basewide Polychlorinated Biphenyl Confirmation Sampling Summary Report, Mare Island, California." February 13.

Tetra Tech. 1998b. "Draft Technical Memorandum Estimation of Ambient Concentrations of Polynuclear Aromatic Hydrocarbons in Soil, Mare Island, Vallejo, California." July 27.

Tetra Tech. 2002. "Final Compilation of Technical Memoranda on Ambient Analyses of Metals in Soils and Groundwater, Mare Island, California." April 19.

U.S. Environmental Protection Agency (EPA). 2002. "Region IX Preliminary Remediation Goals 2002."

TABLE B-2: COMPLETE ANALYTICAL RESULTS FOR AQUEOUS SAMPLES, 2002

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	**23W08**	**23W09**
Sample Date	11/25/2002	11/25/2002
Matrix	WATER	WATER
METALS (ug/L)		
ALUMINUM	200 U	200 U
ANTIMONY	100 U	100 U
ARSENIC	10.0 U	10.0 U
BARIUM	51.8	53.3
BERYLLIUM	10.0 U	10.0 U
CADMIUM	10.0 U	10.0 U
CALCIUM	155,000 J	167,000 J
CHROMIUM	20.0 U	20.0 U
CHROMIUM VI	1.4	0.60
COBALT	20.0 U	20.0 U
COPPER	10.0 U	10.0 U
IRON	1,000 U	1,000 U
LEAD	10.0 U	10.0 U
MAGNESIUM	26,900	30,500
MANGANESE	100 U	100 U
MERCURY	0.50 U	0.50 U
MOLYBDENUM	100 U	100 U
NICKEL	20.0 U	20.0 U
SELENIUM	10.0 U	10.0 U
SILVER	20.0 U	20.0 U
SODIUM	441,000	289,000
THALLIUM	10.0 U	10.0 U
VANADIUM	10.0 U	10.0 U
ZINC	6.6 UJ	7.8 UJ
VOLATILE ORGANIC COMPOUNDS 8260 (ug/L)		
1,1,1-TRICHLOROETHANE	0.5 U	0.5 U
1,1,2,2-TETRACHLOROETHANE	0.5 U	0.5 U
1,1,2-TRICHLOROETHANE	0.5 U	0.5 U
1,1-DICHLOROETHANE	0.5 U	0.5 U
1,1-DICHLOROETHENE	0.5 U	0.5 U

Notes to table on page B-62

TABLE B-2: COMPLETE ANALYTICAL RESULTS FOR AQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	**23W08**	**23W09**
Sample Date	11/25/2002	11/25/2002
Matrix	WATER	WATER
VOLATILE ORGANIC COMPOUNDS 8260 (ug/L) (Continued)		
1,2-DICHLOROETHANE	0.5 U	0.5 U
1,2-DICHLOROETHENE	0.5 U	0.5 U
1,2-DICHLOROPROPANE	0.5 U	0.5 U
2-BUTANONE	5 U	5 U
2-HEXANONE	5 UJ	5 UJ
4-METHYL-2-PENTANONE	5 U	5 U
ACETONE	5 R	5 R
BENZENE	0.4 J	0.5 U
BROMODICHLOROMETHANE	0.5 U	0.5 U
BROMOFORM	0.5 U	0.5 U
BROMOMETHANE	0.5 U	0.5 U
CARBON DISULFIDE	0.5 U	0.5 U
CARBON TETRACHLORIDE	0.5 U	0.5 U
CHLOROBENZENE	0.5 U	0.5 U
CHLOROETHANE	0.5 U	0.5 U
CHLOROFORM	0.5 U	0.5 U
CHLOROMETHANE	0.5 U	0.5 U
CIS-1,3-DICHLOROPROPENE	0.5 U	0.5 U
DIBROMOCHLOROMETHANE	0.5 U	0.5 U
ETHYLBENZENE	0.5 U	0.5 U
METHYLENE CHLORIDE	0.6 UJ	0.6 UJ
STYRENE	0.5 U	0.5 U
TETRACHLOROETHENE	0.5 U	0.5 U
TOLUENE	0.5 J	0.5 U
TRANS-1,3-DICHLOROPROPENE	0.5 U	0.5 U
TRICHLOROETHENE	0.5 U	0.5 U
VINYL ACETATE	1 U	1 U
VINYL CHLORIDE	0.5 U	0.5 U
XYLENE (TOTAL)	0.5 U	0.5 U
TOTAL VOCS 8260	0.8 J	0 U

Notes to table on page B-62

TABLE B-2: COMPLETE ANALYTICAL RESULTS FOR AQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	**23W08**	**23W09**
Sample Date	11/25/2002	11/25/2002
Matrix	WATER	WATER
SEMIVOLATILE ORGANIC COMPOUNDS 8270 (ug/L) (Continued)		
1,2,4-TRICHLOROBENZENE	10 U	10 U
1,2-DICHLOROBENZENE	10 U	10 U
1,3-DICHLOROBENZENE	10 U	10 U
1,4-DICHLOROBENZENE	10 U	10 U
2,2'-OXYBIS(1-CHLOROPROPANE)	10 U	10 U
2,4,5-TRICHLOROPHENOL	47 U	47 U
2,4,6-TRICHLOROPHENOL	10 U	10 U
2,4-DICHLOROPHENOL	10 U	10 U
2,4-DIMETHYLPHENOL	10 U	10 U
2,4-DINITROPHENOL	47 U	47 U
2,4-DINITROTOLUENE	10 U	10 U
2,6-DINITROTOLUENE	10 U	10 U
2-CHLORONAPHTHALENE	10 U	10 U
2-CHLOROPHENOL	10 U	10 U
2-METHYLNAPHTHALENE	10 U	10 U
2-METHYLPHENOL	10 U	10 U
2-NITROANILINE	47 U	47 U
2-NITROPHENOL	10 U	10 U
3,3'-DICHLOROBENZIDINE	19 U	19 U
3-NITROANILINE	47 U	47 U
4,6-DINITRO-2-METHYLPHENOL	47 U	47 U
4-BROMOPHENYL-PHENYL ETHER	10 U	10 U
4-CHLORO-3-METHYLPHENOL	10 U	10 U
4-CHLOROANILINE	10 U	10 U
4-CHLOROPHENYL-PHENYL ETHER	10 U	10 U
4-METHYLPHENOL	10 U	10 U
4-NITROANILINE	47 U	47 U
4-NITROPHENOL	19 UJ	19 UJ
ACENAPHTHENE	10 U	10 U
ACENAPHTHYLENE	10 U	10 U
ANTHRACENE	10 U	10 U

Notes to table on page B-62

TABLE B-2: COMPLETE ANALYTICAL RESULTS FOR AQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	**23W08**	**23W09**
Sample Date	11/25/2002	11/25/2002
Matrix	WATER	WATER
SEMIVOLATILE ORGANIC COMPOUNDS 8270 (ug/L)		
BENZO(A)ANTHRACENE	10 U	10 U
BENZO(A)PYRENE	10 U	10 U
BENZO(B)FLUORANTHENE	10 U	10 U
BENZO(G,H,I)PERYLENE	10 U	10 U
BENZO(K)FLUORANTHENE	10 U	10 U
BIS(2-CHLOROETHOXY)METHANE	10 U	10 U
BIS(2-CHLOROETHYL)ETHER	10 U	10 U
BIS(2-ETHYLHEXYL)PHTHALATE	19 U	19 U
BUTYLBENZYLPHTHALATE	10 U	10 U
CARBAZOLE	10 U	10 U
CHRYSENE	10 U	10 U
DI-N-BUTYLPHTHALATE	10 U	10 U
DI-N-OCTYLPHTHALATE	10 U	10 U
DIBENZ(A,H)ANTHRACENE	10 U	10 U
DIBENZOFURAN	10 U	10 U
DIETHYLPHTHALATE	10 U	10 U
DIMETHYLPHTHALATE	10 U	10 U
FLUORANTHENE	10 U	10 U
FLUORENE	10 U	10 U
HEXACHLOROBENZENE	10 U	10 U
HEXACHLOROBUTADIENE	10 U	10 U
HEXACHLOROCYCLOPENTADIENE	10 U	10 U
HEXACHLOROETHANE	10 U	10 U
INDENO(1,2,3-CD)PYRENE	10 U	10 U
ISOPHORONE	10 U	10 U
N-NITROSO-DI-N-PROPYLAMINE	10 U	10 U
N-NITROSODIPHENYLAMINE (1)	10 U	10 U
NAPHTHALENE	10 U	10 U
NITROBENZENE	10 U	10 U
PENTACHLOROPHENOL	28 U	28 U
PHENANTHRENE	10 U	10 U

Notes to table on page B-62

TABLE B-2: COMPLETE ANALYTICAL RESULTS FOR AQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	**23W08**	**23W09**
Sample Date	11/25/2002	11/25/2002
Matrix	WATER	WATER
SEMIVOLATILE ORGANIC COMPOUNDS 8270 (ug/L) (Continued)		
PHENOL	10 U	10 U
PYRENE	10 U	10 U
TOTAL SVOCS 8270	0 U	0 U
PESTICIDES (ug/L)		
4,4'-DDD	6 U	6 U
4,4'-DDE	6 U	6 U
4,4'-DDT	6 UJ	6 UJ
ALDRIN	3 U	3 U
ALPHA-BHC	3 U	3 U
ALPHA-CHLORDANE	3 U	3 U
DIELDRIN	6 U	6 U
ENDRIN	6 U	6 U
GAMMA-BHC (LINDANE)	3 U	3 U
GAMMA-CHLORDANE	3 U	3 U
HEPTACHLOR	3 U	3 U
HEPTACHLOR EPOXIDE	**0.04 J**	3 U
METHOXYCHLOR	28 U	28 U
TOXAPHENE	57 U	57 U
PCBs (ug/L)		
AROCLOR-1016	15 U	15 U
AROCLOR-1221	15 U	15 U
AROCLOR-1232	15 U	15 U
AROCLOR-1242	15 U	15 U
AROCLOR-1248	15 U	15 U
AROCLOR-1254	15 U	15 U
AROCLOR-1260	15 U	15 U
TOTAL PCBS	0 U	0 U

Notes to table on page B-62

TABLE B-2: COMPLETE ANALYTICAL RESULTS FOR AQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	**23W08**	**23W09**
Sample Date	11/25/2002	11/25/2002
Matrix	WATER	WATER
PETROLEUM INDICATORS (mg/L)		
DIESEL RANGE	0.10 U	0.10 U
GASOLINE RANGE	0.06 UJ	0.07 UJ
MOTOR OIL RANGE	0.48 U	0.48 U
TPH-DR/MR	0 U	0 U
TPH-GR	0 U	0 U

Notes to table on page B-62

TABLE B-2: COMPLETE ANALYTICAL RESULTS FOR AQUEOUS SAMPLES, 2002 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Notes: U = Not detected at given detection limit J = Estimated value

R = Rejected result; laboratory did not satisfy quality assurance/quality control requirements for accuracy.

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

TPH results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Concentrations shown in bold exceed the higher value of the ambient concentration (95th percentile) (Tetra Tech 2002) and ecological criteria (RWQCB 2000).

Sources: California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB). 2000. "A Compilation of Water Quality Goals." Prepared by Jon B. Marshack, D. Env. Senior Environmental Specialist. August.

Tetra Tech EM Inc. (Tetra Tech). 2002. "Final Compilation of Technical Memoranda on Ambient Analyses of Metals in Soils and Groundwater, Mare Island, California." April 19.

TABLE B-3: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2003

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	**ELEMGB028**	**ELEMGB028**	**ELEMGB028**	**ELEMGB029**	**ELEMGB029**	**ELEMGB029**
Sample Depth (feet bgs)	11.0 - 12.0	23.0 - 24.0	31.0 - 32.0	19.0 - 20.0	25.0 - 26.0	31.0 - 32.0
Sample Date	08/19/2003	08/19/2003	08/19/2003	08/19/2003	08/19/2003	08/19/2003
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SEMIVOLATILE ORGANIC COMPOUNDS (mg/kg)						
ACENAPHTHENE	NA	NA	0.02 U	NA	0.03 U	NA
ACENAPHTHYLENE	NA	NA	0.02 U	NA	0.03 U	NA
ANTHRACENE	NA	NA	0.02 U	NA	0.03 U	NA
BENZO(A)ANTHRACENE	NA	NA	0.03 U	NA	0.04 U	NA
BENZO(A)PYRENE	NA	NA	0.02 U	NA	0.03 U	NA
BENZO(B)FLUORANTHENE	NA	NA	0.03 U	NA	0.04 U	NA
BENZO(G,H,I)PERYLENE	NA	NA	0.02 U	NA	0.03 U	NA
BENZO(K)FLUORANTHENE	NA	NA	0.02 U	NA	0.03 U	NA
CHRYSENE	NA	NA	0.02 U	NA	0.03 U	NA
DIBENZ(A,H)ANTHRACENE	NA	NA	0.02 U	NA	0.03 U	NA
FLUORANTHENE	NA	NA	0.02 U	NA	0.03 U	NA
FLUORENE	NA	NA	0.02 U	NA	0.03 U	NA
INDENO(1,2,3-CD)PYRENE	NA	NA	0.02 U	NA	0.03 U	NA
NAPHTHALENE	NA	NA	0.02 U	NA	0.03 U	NA
PHENANTHRENE	NA	NA	0.02 U	NA	0.03 U	NA
PYRENE	NA	NA	0.02 U	NA	0.03 U	NA
TOTAL SVOCS	NA	NA	0 U	NA	0 U	NA
PETROLEUM INDICATORS (mg/kg)						
DIESEL RANGE	12.0 U	12.0 U	12.0 U	21.0 D	36.0 D	12.0 U
MOTOR OIL RANGE	60.0 U	61.0 U	60.0 U	60.0 U	70.0 U	60.0 U
TOTAL TPH	0 U	0 U	0 U	21.0 D	36.0 D	0 U

TABLE B-3: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2003 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	**ELEMGB030**	**ELEMGB030**	**ELEMGB030**	**ELEMGB031**	**ELEMGB031**	**ELEMGB031**
Sample Depth (feet bgs)	9.0 - 10.0	19.0 - 20.0	31.0 - 32.0	9.0 - 10.0	16.0 - 17.0	26.0 - 27.0
Sample Date	08/19/2003	08/19/2003	08/19/2003	08/19/2003	08/19/2003	08/19/2003
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SEMIVOLATILE ORGANIC COMPOUNDS (mg/kg)						
ACENAPHTHENE	NA	0.02 U	NA	NA	0.02 U	NA
ACENAPHTHYLENE	NA	0.02 U	NA	NA	0.02 U	NA
ANTHRACENE	NA	0.02 U	NA	NA	0.02 U	NA
BENZO(A)ANTHRACENE	NA	0.03 U	NA	NA	0.03 U	NA
BENZO(A)PYRENE	NA	0.02 U	NA	NA	0.02 U	NA
BENZO(B)FLUORANTHENE	NA	0.03 U	NA	NA	0.03 U	NA
BENZO(G,H,I)PERYLENE	NA	0.02 U	NA	NA	0.02 U	NA
BENZO(K)FLUORANTHENE	NA	0.02 U	NA	NA	0.02 U	NA
CHRYSENE	NA	0.02 U	NA	NA	0.02 U	NA
DIBENZ(A,H)ANTHRACENE	NA	0.02 U	NA	NA	0.02 U	NA
FLUORANTHENE	NA	0.02 U	NA	NA	0.02 U	NA
FLUORENE	NA	0.02 U	NA	NA	0.02 U	NA
INDENO(1,2,3-CD)PYRENE	NA	0.02 U	NA	NA	0.02 U	NA
NAPHTHALENE	NA	0.02 U	NA	NA	0.02 U	NA
PHENANTHRENE	NA	0.02 U	NA	NA	0.02 U	NA
PYRENE	NA	0.02 U	NA	NA	0.02 U	NA
TOTAL SVOCS	NA	0 U	NA	NA	0 U	NA
PETROLEUM INDICATORS (mg/kg)						
DIESEL RANGE	12.0 U	880 DJ	12.0 U	12.0 U	20.0 D	11.0 U
MOTOR OIL RANGE	58.0 U	59.0 U	58.0 U	58.0 U	58.0 U	56.0 U
TOTAL TPH	0 U	880 DJ	0 U	0 U	20.0 D	0 U

TABLE B-3: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2003 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB032	ELEMGB032	ELEMGB032	ELEMGB033	ELEMGB033	ELEMGB033
Sample Depth (feet bgs)	9.0 - 10.0	13.0 - 14.0	16.0 - 17.0	11.0 - 12.0	19.0 - 20.0	27.0 - 28.0
Sample Date	08/20/2003	08/20/2003	08/20/2003	08/20/2003	08/20/2003	08/20/2003
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SEMIVOLATILE ORGANIC COMPOUNDS (mg/kg)						
ACENAPHTHENE	NA	0.02 UJ	NA	NA	0.02 U	NA
ACENAPHTHYLENE	NA	0.02 UJ	NA	NA	0.02 U	NA
ANTHRACENE	NA	0.02 UJ	NA	NA	0.02 U	NA
BENZO(A)ANTHRACENE	NA	0.03 UJ	NA	NA	0.03 U	NA
BENZO(A)PYRENE	NA	0.02 UJ	NA	NA	0.02 U	NA
BENZO(B)FLUORANTHENE	NA	0.03 UJ	NA	NA	0.03 U	NA
BENZO(G,H,I)PERYLENE	NA	0.02 UJ	NA	NA	0.02 U	NA
BENZO(K)FLUORANTHENE	NA	0.02 UJ	NA	NA	0.02 U	NA
CHRYSENE	NA	0.02 UJ	NA	NA	0.02 U	NA
DIBENZ(A,H)ANTHRACENE	NA	0.02 UJ	NA	NA	0.02 U	NA
FLUORANTHENE	NA	0.02 UJ	NA	NA	0.02 U	NA
FLUORENE	NA	0.02 UJ	NA	NA	0.02 U	NA
INDENO(1,2,3-CD)PYRENE	NA	0.02 UJ	NA	NA	0.02 U	NA
NAPHTHALENE	NA	0.02 UJ	NA	NA	0.02 U	NA
PHENANTHRENE	NA	0.02 UJ	NA	NA	0.02 U	NA
PYRENE	NA	0.02 UJ	NA	NA	0.02 U	NA
TOTAL SVOCS	NA	0 U	NA	NA	0 U	NA
PETROLEUM INDICATORS (mg/kg)						
DIESEL RANGE	12.0 U	12.0 U	11.0 U	12.0 U	11.0 U	12.0 U
MOTOR OIL RANGE	61.0 U	59.0 U	57.0 U	58.0 U	56.0 U	58.0 U
TOTAL TPH	0 U	0 U	0 U	0 U	0 U	0 U

TABLE B-3: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2003 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	ELEMGB034	ELEMGB034	ELEMGB034	ELEMGB035	ELEMGB035	ELEMGB035
Sample Depth (feet bgs)	9.0 - 10.0	13.0 - 14.0	16.0 - 17.0	17.0 - 18.0	19.0 - 20.0	20.0 - 21.0
Sample Date	08/20/2003	08/20/2003	08/20/2003	08/20/2003	08/20/2003	08/20/2003
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SEMIVOLATILE ORGANIC COMPOUNDS (mg/kg)						
ACENAPHTHENE	0.02 U	NA	NA	0.02 U	NA	NA
ACENAPHTHYLENE	0.02 U	NA	NA	0.02 U	NA	NA
ANTHRACENE	0.02 U	NA	NA	0.02 U	NA	NA
BENZO(A)ANTHRACENE	0.03 U	NA	NA	0.03 U	NA	NA
BENZO(A)PYRENE	0.02 U	NA	NA	0.02 U	NA	NA
BENZO(B)FLUORANTHENE	0.03 U	NA	NA	0.03 U	NA	NA
BENZO(G,H,I)PERYLENE	0.02 U	NA	NA	0.02 U	NA	NA
BENZO(K)FLUORANTHENE	0.02 U	NA	NA	0.02 U	NA	NA
CHRYSENE	0.02 U	NA	NA	0.02 U	NA	NA
DIBENZ(A,H)ANTHRACENE	0.02 U	NA	NA	0.02 U	NA	NA
FLUORANTHENE	0.02 U	NA	NA	0.02 U	NA	NA
FLUORENE	0.02 U	NA	NA	0.02 U	NA	NA
INDENO(1,2,3-CD)PYRENE	0.02 U	NA	NA	0.02 U	NA	NA
NAPHTHALENE	0.02 U	NA	NA	0.02 U	NA	NA
PHENANTHRENE	0.02 U	NA	NA	0.02 U	NA	NA
PYRENE	0.02 U	NA	NA	0.02 U	NA	NA
TOTAL SVOCS	0 U	NA	NA	0 U	NA	NA
PETROLEUM INDICATORS (mg/kg)						
DIESEL RANGE	11.0 U	11.0 U	11.0 U	12.0 U	11.0 U	11.0 U
MOTOR OIL RANGE	56.0 U	57.0 U	57.0 U	58.0 U	55.0 U	54.0 U
TOTAL TPH	0 U	0 U	0 U	0 U	0 U	0 U

TABLE B-3: COMPLETE ANALYTICAL RESULTS FOR NONAQUEOUS SAMPLES, 2003 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Notes: U = Not detected at given detection limit J = Estimated value NA = Not analyzed

D = Pattern resembles diesel.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

TPH results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

Diesel range includes hydrocarbons quantified as diesel and diesel-range unknowns.

Motor oil range includes hydrocarbons quantified as motor oil and motor-oil-range unknowns.

Sources

PRC Environmental Management, Inc. (PRC). 1997. "Draft Final Group II and III Accelerated Study Field Sampling and Analysis Plan, Mare Island." August 5.

Tetra Tech EM Inc. (Tetra Tech). 1998a. "Basewide Polychlorinated Biphenyl Confirmation Sampling Summary Report, Mare Island, California." February 13.

Tetra Tech. 1998b. "Draft Technical Memorandum Estimation of Ambient Concentrations of Polynuclear Aromatic Hydrocarbons in Soil, Mare Island, Vallejo, California." July 27.

Tetra Tech. 2002. "Final Compilation of Technical Memoranda on Ambient Analyses of Metals in Soils and Groundwater, Mare Island, California." April 19.

U.S. Environmental Protection Agency (EPA). 2002. "Region IX Preliminary Remediation Goals 2002."

TABLE B-4: COMPLETE ANALYTICAL RESULTS FOR AQUEOUS SAMPLES, 2003

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	**ELEMGB028**	**ELEMGB029**	**ELEMGB030**	**ELEMGB031**	**ELEMGB032**	**ELEMGB033**
Sample Date	08/20/2003	08/20/2003	08/20/2003	08/20/2003	08/21/2003	08/20/2003
Matrix	WATER	WATER	WATER	WATER	WATER	WATER
PETROLEUM INDICATORS (mg/L)						
DIESEL RANGE	0.10 U	0.09 U	0.09 U	0.10 U	0.09 U	0.32 D
MOTOR OIL RANGE	0.25 MJ	0.10 MJ	0.14 MJ	0.50 U	0.60 L	2.8 M
TPH-DR/MR	0.25 MJ	0.10 MJ	0.14 MJ	0 U	0.60 L	3.1 DM αβ

TABLE B-4: COMPLETE ANALYTICAL RESULTS FOR AQUEOUS SAMPLES, 2003 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Sample Location ID	**ELEMGB034**	**ELEMGB035**
Sample Date	08/21/2003	08/21/2003
Matrix	WATER	WATER
PETROLEUM INDICATORS (mg/L)		
DIESEL RANGE	0.09 U	0.05 D
MOTOR OIL RANGE	0.29 LJ	0.50 L
TPH-DR/MR	0.29 LJ	0.55 DL

TABLE B-4: COMPLETE ANALYTICAL RESULTS FOR AQUEOUS SAMPLES, 2003 (Continued)

Final Site Inspection Report for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California

Notes: U = Not detected at given detection limit J = Estimated value

D = Pattern resembles diesel. L = Pattern is in the lighter hydrocarbon end of the analyte's range in the standard.

M = Pattern resembles motor oil.

Organic results less than 10 are reported to one significant figure, and results greater than 10 are reported to two significant figures.

TPH results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

β = Concentrations greater than the human health ingestion screening criteria.

α = Concentrations greater than the ecological screening criteria (RWQCB 2000).

Sources

California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB). 2000. "A Compilation of Water Quality Goals." Prepared by Jon B. Marshack, D. Env. Senior Environmental Specialist. August.

Tetra Tech EM Inc. (Tetra Tech). 2002. "Final Compilation of Technical Memoranda on Ambient Analyses of Metals in Soils and Groundwater, Mare Island, California." April 19.

APPENDIX C
WASTE DOCUMENTATION

25 pages.

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Hexavalent Chromium

Lab #:	162194	Location:	Mare Island School Sampl.
Client:	Tetra Tech EMI	Prep:	METHOD
Project#:	G0069179W1603	Analysis:	EPA 7199
Analyte:	Hexavalent Chromium	Batch#:	77154
Matrix:	Water	Sampled:	11/25/02
Units:	ug/L	Received:	11/25/02
Diln Fac:	1.000	Analyzed:	11/25/02

Field ID	Type	Lab ID	Result	RL
179ELEMWB001	SAMPLE	162194-001	1.4	0.50
179ELEMWB002	SAMPLE	162194-002	0.60	0.50
	BLANK	QC197006	ND	0.50

ND= Not Detected
RL= Reporting Limit

1.0

METHOD 3050B/6010B
METALS BY TRACE ICP

Client	: TETRA TECH EMI	Date Collected:	11/24/02
Project	: MARE ISLAND SCHOOL	Date Received:	11/26/02
SDG NO.	: 02K228	Date Extracted:	12/02/02 15:30
Sample ID:	179ELEMGP006	Date Analyzed:	12/10/02 03:52
Lab Samp ID:	K228-06	Dilution Factor:	1
Lab File ID:	I73L017019	Matrix :	SOIL
Ext Btch ID:	IPL006S	% Moisture :	18.1
Calib. Ref.:	I73L017009	Instrument ID :	EMAXTI73

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Arsenic	3.79	1.22	.244
Lead	620	1.22	.208
Manganese	813	1.22	.122
Selenium	ND	1.22	.366
Thallium	ND	1.22	.366

RL: Reporting Limit

SW3550B/8082
PCBs

Client : TETRA TECH EMI	Date Collected: 11/24/02
Project : MARE ISLAND SCHOOL	Date Received: 11/26/02
Batch No. : 02K229	Date Extracted: 11/27/02 17:30
Sample ID: 179ELEMGP028	Date Analyzed: 11/30/02 17:43
Lab Samp ID: K229-05	Dilution Factor: 1
Lab File ID: SK29069A	Matrix : SOIL
Ext Btch ID: CPK031S	% Moisture : 12.8
Calib. Ref.: SK29058A	Instrument ID : GCT008

PARAMETERS	RESULTS (ug/kg)	RL (ug/kg)	MDL (ug/kg)
AROCLOR 1016	(ND) | ND	38	19 | 19
AROCLOR 1221	(ND) | ND	77	19 | 19
AROCLOR 1232	(ND) | ND	38	19 | 19
AROCLOR 1242	(ND) | ND	38	19 | 19
AROCLOR 1248	(ND) | ND	38	19 | 19
AROCLOR 1254	(ND) | ND	38	19 | 19
AROCLOR 1260	(50) | 42	38	19 | 19

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	(107) | 89	47-137
DECACHLOROBIPHENYL	(93) | 74	34-129

RL: Reporting Limit
Left of | is related to first column ; Right of | related to second column
( ) included the reported column
* Out side of QC Limit

SW 3550B/8270C
SEMI VOLATILE ORGANICS BY GC/MS

Client	: TETRA TECH EMI	Date Collected:	11/24/02
Project	: MARE ISLAND SCHOOL	Date Received:	11/26/02
Batch No.	: 02K229	Date Extracted:	11/26/02 20:30
Sample ID:	179ELEMGP032	Date Analyzed:	12/04/02 00:43
Lab Samp ID:	K229-09	Dilution Factor:	1
Lab File ID:	RLH044	Matrix :	SOIL
Ext Btch ID:	SVK038S	% Moisture :	14.8
Calib. Ref.:	RJH406	Instrument ID :	T-041

PARAMETERS	RESULTS (ug/kg)	RL (ug/kg)	MDL (ug/kg)
1,2,4-TRICHLOROBENZENE	ND	390	200
1,2-DICHLOROBENZENE	ND	390	93
1,3-DICHLOROBENZENE	ND	390	69
1,4-DICHLOROBENZENE	ND	390	83
2,4,5-TRICHLOROPHENOL	ND	970	200
2,4,6-TRICHLOROPHENOL	ND	390	200
2,4-DICHLOROPHENOL	ND	390	200
2,4-DIMETHYLPHENOL	ND	390	200
2,4-DINITROPHENOL	ND	970	200
2,4-DINITROTOLUENE	ND	390	200
2,6-DINITROTOLUENE	ND	390	200
2-CHLORONAPHTHALENE	ND	390	200
2-CHLOROPHENOL	ND	390	200
2-METHYLNAPHTHALENE	ND	390	200
2-METHYLPHENOL	ND	390	200
2-NITROANILINE	ND	970	200
2-NITROPHENOL	ND	390	200
3,3'-DICHLOROBENZIDINE	ND	390	200
3-NITROANILINE	ND	970	200
4,6-DINITRO-2-METHYLPHENOL	ND	970	200
4-BROMOPHENYL-PHENYL ETHER	ND	970	200
4-CHLORO-3-METHYLPHENOL	ND	390	200
4-CHLOROANILINE	ND	390	200
4-CHLOROPHENYL-PHENYL ETHER	ND	970	200
4-METHYLPHENOL (1)	ND	390	200
4-NITROANILINE	ND	940	200
4-NITROPHENOL	ND	940	200
ACENAPHTHENE	ND	390	200
ACENAPHTHYLENE	ND	390	200
ANTHRACENE	ND	390	200
BIS(2-CHLOROETHOXY)METHANE	ND	390	200
BIS(2-CHLOROETHYL)ETHER	ND	390	200
BIS(2-CHLOROISOPROPYL)ETHER	ND	390	200
BIS(2-ETHYLHEXYL)PHTHALATE	160J	190	60
BUTYLBENZYLPHTHALATE	ND	390	200
CHRYSENE	ND	390	200
DI-N-BUTYLPHTHALATE	ND	390	200
DI-N-OCTYLPHTHALATE	ND	390	200
DIBENZOFURAN	ND	390	200
DIETHYLPHTHALATE	3700	390	200
DIMETHYLPHTHALATE	ND	390	200
HEXACHLOROBENZENE	ND	390	200
HEXACHLOROBUTADIENE	ND	390	200
HEXACHLOROCYCLOPENTADIENE	ND	390	200
HEXACHLOROETHANE	ND	390	200
ISOPHORONE	ND	390	200
N-NITROSO-DI-N-PROPYLAMINE	ND	390	200
N-NITROSODIPHENYLAMINE (2)	ND	390	200
NAPHTHALENE	ND	390	200
NITROBENZENE	ND	390	200
PENTACHLOROPHENOL	ND	970	200
PHENANTHRENE	ND	390	200
PHENOL	ND	390	200
CARBAZOLE	ND	390	200

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
2,4,6-TRIBROMOPHENOL	95	19-122
2-FLUOROBIPHENYL	69	30-115
2-FLUOROPHENOL	57	25-121
NITROBENZENE-D5	73	23-120
PHENOL-D5	67	24-113
TERPHENYL-D14	62	18-137

RL: Reporting Limit
(1): Cannot be separated from 3-Methylphenol
(2): Cannot be separated from Diphenylamine

SW 5035/8260B
VOLATILE ORGANICS BY GC/MS

Client : TETRA TECH EMI	Date Collected: 11/25/02
Project : MARE ISLAND SCHOOL	Date Received: 11/27/02
Batch No. : 02K237	Date Extracted: 12/07/02 04:17
Sample ID: 179ELEMGP048	Date Analyzed: 12/07/02 04:17
Lab Samp ID: K237-03	Dilution Factor: 1.1
Lab File ID: RLW187	Matrix : SOIL
Ext Btch ID: VO06L19	% Moisture : 19.9
Calib. Ref.: RKW560	Instrument ID : T-006

PARAMETERS	RESULTS (ug/kg)	RL (ug/kg)	MDL (ug/kg)
1,1,1-TRICHLOROETHANE	ND	14	2.7
1,1,2,2-TETRACHLOROETHANE	ND	14	2.7
1,1,2-TRICHLOROETHANE	ND	14	2.7
1,1-DICHLOROETHANE	ND	14	2.7
1,1-DICHLOROETHENE	ND	14	2.7
1,2-DICHLOROETHANE	ND	14	2.7
1,2-DICHLOROETHENE	ND	14	2.7
1,2-DICHLOROPROPANE	ND	14	2.7
2-BUTANONE (MEK)	28	14	6.9
2-HEXANONE	ND	14	6.9
4-METHYL-2-PENTANONE (MIBK)	ND	14	6.9
ACETONE	370	14	6.9
BENZENE	ND	14	2.7
BROMODICHLOROMETHANE	ND	14	2.7
BROMOFORM	ND	14	2.7
BROMOMETHANE	ND	14	4.1
CARBON DISULFIDE	ND	14	2.7
CARBON TETRACHLORIDE	ND	14	2.7
CHLOROBENZENE	ND	14	2.7
CHLOROETHANE	ND	14	4.1
CHLOROFORM	ND	14	2.7
CHLOROMETHANE	ND	14	6.9
CIS-1,3-DICHLOROPROPENE	ND	14	2.7
DIBROMOCHLOROMETHANE	ND	14	2.7
ETHYLBENZENE	ND	14	2.7
METHYLENE CHLORIDE	ND	14	2.7
STYRENE	ND	14	2.7
TETRACHLOROETHENE	ND	14	2.7
TOLUENE	16	14	2.7
TRANS-1,3-DICHLOROPROPENE	ND	14	2.7
TRICHLOROETHENE	ND	14	2.7
VINYL ACETATE	ND	14	2.7
VINYL CHLORIDE	ND	14	2.7
M,P-XYLENES	ND	14	4.1
O-XYLENE	ND	14	2.7

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	116	78-129
BROMOFLUOROBENZENE	97	70-130
TOLUENE-D8	112	77-120

Preservation Date: 11/27/02 11:30

SW 3550B/8270C
SEMI VOLATILE ORGANICS BY GC/MS

Client	: TETRA TECH EMI	Date Collected:	11/25/02
Project	: MARE ISLAND SCHOOL	Date Received:	11/27/02
Batch No.	: 02K237	Date Extracted:	12/02/02 13:00
Sample ID:	179ELEMGP054	Date Analyzed:	12/06/02 14:51
Lab Samp ID:	K237-09	Dilution Factor:	1
Lab File ID:	RLH089	Matrix	: SOIL
Ext Btch ID:	SVL001S	% Moisture	: 11.3
Calib. Ref.:	RJH406	Instrument ID	: T-041

PARAMETERS	RESULTS (ug/kg)	RL (ug/kg)	MDL (ug/kg)
1,2,4-TRICHLOROBENZENE	ND	370	190
1,2-DICHLOROBENZENE	ND	370	90
1,3-DICHLOROBENZENE	ND	370	66
1,4-DICHLOROBENZENE	ND	370	80
2,4,5-TRICHLOROPHENOL	ND	940	190
2,4,6-TRICHLOROPHENOL	ND	370	190
2,4-DICHLOROPHENOL	ND	370	190
2,4-DIMETHYLPHENOL	ND	370	190
2,4-DINITROPHENOL	ND	940	190
2,4-DINITROTOLUENE	ND	370	190
2,6-DINITROTOLUENE	ND	370	190
2-CHLORONAPHTHALENE	ND	370	190
2-CHLOROPHENOL	ND	370	190
2-METHYLNAPHTHALENE	ND	370	190
2-METHYLPHENOL	ND	370	190
2-NITROANILINE	ND	940	190
2-NITROPHENOL	ND	370	190
3,3'-DICHLOROBENZIDINE	ND	370	190
3-NITROANILINE	ND	940	190
4,6-DINITRO-2-METHYLPHENOL	ND	940	190
4-BROMOPHENYL-PHENYL ETHER	ND	940	190
4-CHLORO-3-METHYLPHENOL	ND	370	190
4-CHLOROANILINE	ND	370	190
4-CHLOROPHENYL-PHENYL ETHER	ND	940	190
4-METHYLPHENOL (1)	ND	370	190
4-NITROANILINE	ND	900	190
4-NITROPHENOL	ND	900	190
ACENAPHTHENE	ND	370	190
ACENAPHTHYLENE	ND	370	190
ANTHRACENE	ND	370	190
BIS(2-CHLOROETHOXY)METHANE	ND	370	190
BIS(2-CHLOROETHYL)ETHER	ND	370	190
BIS(2-CHLOROISOPROPYL)ETHER	ND	370	190
BIS(2-ETHYLHEXYL)PHTHALATE	950	180	58
BUTYLBENZYLPHTHALATE	ND	370	190
CHRYSENE	ND	370	190
DI-N-BUTYLPHTHALATE	1600	370	190
DI-N-OCTYLPHTHALATE	ND	370	190
DIBENZOFURAN	ND	370	190
DIETHYLPHTHALATE	ND	370	190
DIMETHYLPHTHALATE	ND	370	190
HEXACHLOROBENZENE	ND	370	190
HEXACHLOROBUTADIENE	ND	370	190
HEXACHLOROCYCLOPENTADIENE	ND	370	190
HEXACHLOROETHANE	ND	370	190
ISOPHORONE	ND	370	190
N-NITROSO-DI-N-PROPYLAMINE	ND	370	190
N-NITROSODIPHENYLAMINE (2)	ND	370	190
NAPHTHALENE	ND	370	190
NITROBENZENE	ND	370	190
PENTACHLOROPHENOL	ND	940	190
PHENANTHRENE	ND	370	190
PHENOL	ND	370	190
CARBAZOLE	ND	370	190

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
2,4,6-TRIBROMOPHENOL	88	19-122
2-FLUOROBIPHENYL	60	30-115
2-FLUOROPHENOL	54	25-121
NITROBENZENE-D5	64	23-120
PHENOL-D5	63	24-113
TERPHENYL-D14	73	18-137

RL: Reporting Limit
(1): Cannot be separated from 3-Methylphenol
(2): Cannot be separated from Diphenylamine

METHOD 3050B/6010B
METALS BY ICP

Client	: TETRA TECH EMI	Date Collected:	11/25/02
Project	: MARE ISLAND SCHOOL	Date Received:	11/27/02
SDG NO.	: 02K237	Date Extracted:	12/03/02 15:40
Sample ID:	179ELEMGP051	Date Analyzed:	12/06/02 00:05
Lab Samp ID:	K237-06	Dilution Factor:	1
Lab File ID:	I07L006035	Matrix :	SOIL
Ext Btch ID:	IPL009S	% Moisture :	12.9
Calib. Ref.:	I07L006032	Instrument ID :	EMAXTI07

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Aluminum	27300	23	5.74
Antimony	5.57J	11.5	2.3
Barium	182	11.5	.172
Beryllium	.712	.574	.172
Cadmium	ND	.574	.574
Calcium	20900	115	8.61
Chromium	111	2.3	.689
Cobalt	22.7	2.3	.861
Copper	61.7	1.15	.574
Iron	34000	11.5	1.72
Magnesium	18400	115	11.5
Molybdenum	ND	5.74	.861
Nickel	136	2.3	.631
Silver	ND	2.3	.723
Sodium	294	115	28.7
Vanadium	63.6	1.15	.574
Zinc	71.4	2.3	.344

RL: Reporting Limit

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

Client	: TETRA TECH EMI	Date Collected:	11/25/02
Project	: MARE ISLAND SCHOOL	Date Received:	11/27/02
Batch No.	: 02K243	Date Extracted:	12/07/02 08:29
Sample ID:	179ELEMWB002	Date Analyzed:	12/07/02 08:29
Lab Samp ID:	K243-02	Dilution Factor:	1
Lab File ID:	RLB161	Matrix :	WATER
Ext Btch ID:	VO03L17	% Moisture :	NA
Calib. Ref.:	RKB343	Instrument ID :	T-003

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	.5	.2
1,1,2,2-TETRACHLOROETHANE	ND	.5	.3
1,1,2-TRICHLOROETHANE	ND	.5	.2
1,1-DICHLOROETHANE	ND	.5	.2
1,1-DICHLOROETHENE	ND	.5	.2
1,2-DICHLOROETHANE	ND	.5	.2
1,2-DICHLOROETHENE	ND	.5	.2
1,2-DICHLOROPROPANE	ND	.5	.2
2-BUTANONE (MEK)	ND	5	5
2-HEXANONE	ND	5	1
4-METHYL-2-PENTANONE (MIBK)	ND	5	1
ACETONE	ND	5	2
BENZENE	ND	.5	.2
BROMODICHLOROMETHANE	ND	.5	.2
BROMOFORM	ND	.5	.2
BROMOMETHANE	ND	.5	.2
CARBON DISULFIDE	ND	.5	.2
CARBON TETRACHLORIDE	ND	.5	.2
CHLOROBENZENE	ND	.5	.2
CHLOROETHANE	ND	.5	.2
CHLOROFORM	ND	.5	.2
CHLOROMETHANE	ND	.5	.5
CIS-1,3-DICHLOROPROPENE	ND	.5	.2
DIBROMOCHLOROMETHANE	ND	.5	.2
ETHYLBENZENE	ND	.5	.2
METHYLENE CHLORIDE	.62B	.5	.12
STYRENE	ND	.5	.2
TETRACHLOROETHENE	ND	.5	.2
TOLUENE	ND	.5	.2
TRANS-1,3-DICHLOROPROPENE	ND	.5	.2
TRICHLOROETHENE	ND	.5	.2
VINYL ACETATE	ND	1	.7
VINYL CHLORIDE	ND	.5	.3
M,P-XYLENES	ND	1	.3
O-XYLENE	ND	.5	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	119	78-129
BROMOFLUOROBENZENE	104	70-130
TOLUENE-D8	110	77-120

CTC 179, PM: Brenda McCarthy

State of California—Environmental Protection Agency
Form Approved OMB No. 2050-0039 (Expires 9-30-99)
Please print or type. *Form designed for use on elite (12-pitch) typewriter.*

See Instructions on back of page 6.

Department of Toxic Substances Control
Sacramento, California

21981134

IN CASE OF EMERGENCY OR SPILL, CALL THE NATIONAL RESPONSE CENTER 1-800-424-8802: WITHIN CALIFORNIA, CALL 1-800-852-7550

GENERATOR

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: CA717002477 5
Manifest Document No.: 0 3 0 1 9
2. Page 1 of 1
Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
MARE ISLAND CSO EFAW BP
ROICE OFFICE, SAN FRANCISCO
2450 SARATOGA ST, STE 200
~~P.O. BOX 2193 BLDG. 535~~
~~VALLEJO CA 94592-0193~~
ALAMEDA, CA 94501

4. Generator's Phone (707) ~~646-6363~~ 333-8197

A. State Manifest Document Number: 21981134

B. State Generator's ID: HYH036020982

5. Transporter 1 Company Name: ONYX ENVIRONMENTAL SVCS L.L.C.
6. US EPA ID Number: NJD080631369

C. State Transporter's ID [Reserved.]

D. Transporter's Phone: (973) 347-7111

7. Transporter 2 Company Name
8. US EPA ID Number

E. State Transporter's ID [Reserved.]

F. Transporter's Phone

9. Designated Facility Name and Site Address
CHEMICAL WASTE MANAGEMENT, INC
35251 OLD SKYLINE ROAD
KETTLEMAN CITY, CA 93239

10. US EPA ID Number
P.O. BOX 471
CAT000646117

G. State Facility's ID

H. Facility's Phone: (559) 386-9711

11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste Number
HAZARDOUS WASTE, LIQUID, n.o.s. (CHROMIUM, LEAD) 9,NA3082,III	001	DM	00400	P	State 343; EPA/Other D007
b.					State; EPA/Other
c.					State; EPA/Other
d.					State; EPA/Other

J. Additional Descriptions for Materials Listed Above
A)L/E KHFEB5470

K. Handling Codes for Wastes Listed Above
a. b.
c. d.

15. Special Handling Instructions and Additional Information
PACKING SLIPS ATTACHED FOR CLARIFICATION EMERGENCY NUMBER-INFOTRAC:800 535-5053
C.O.D REQUIRED: REMIT TO: ONYX 4227 TECHNOLOGY DR
FREMONT CA 94578

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: Bob Palmer
Signature: [signature]
Month Day Year: 01 16 03

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: BREAL BOSWORTH
Signature: [signature]
Month Day Year: 01 16 03

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name
Signature
Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name
Signature
Month Day Year

DO NOT WRITE BELOW THIS LINE.

DTSC 8022A (1/99)
EPA 8700—22

Blue: GENERATOR SENDS THIS COPY TO DTSC WITHIN 30 DAYS.
To: P.O. Box 400, Sacramento, CA 95812-0400

ONYX ENVIRONMENTAL SERVICES

ONYX

LAND DISPOSAL NOTIFICATION AND CERTIFICATION FORM PHASE IV

Page 1 of 1

Generator Name: MARE ISLAND CSO EPA ID # CA7600 2477 State Manifest No. 2198 1134

1. If waste is a wastewater (see 40 CFR 268.2) place "w" next to the applicable code(s)

Profile # _____

2. CODES WITH SUBCATEGORIES (place appropriate letter from section 8 before each code that applies) (See 40 CFR 268 for details)

___ D001 Hi-TOC
___ D001 Except Hi-TOC
___ D003 Reactive Cyanide
___ D003 Reactive Sulfide
___ D003 Explosive
___ D003 Water Reactives
___ D003 Unexp Ord. Emg
___ D003 Other Reactives
___ D006 Batteries
___ D008 Lead acid batteries
___ D009 Organic Hg > 260ppm
___ D009 Inorg. Hg > 260
___ D009 Hg < 260
___ F025 Light ends
___ F025 Spent filter
___ K006 Hydrated
___ K006 Anhydrous
___ K069 Calcium Sulfate
___ K069 Not Calcium Sulfate
___ K071 Rmerc Res.
___ K071 Not Rmerc Res.
___ K106 Lo Rmerc Res.
___ K106 Not Rmerc Res.
___ K106 > 260 ppm Hg
___ P047 Salts
___ P047 Nonsalts
___ P065 Lo Inc. Res.
___ P065 Lo RMERC Res.
___ P065 Not Inc./RMERC Res.
___ P065 Hi Inc./RMERC Res.
___ P092 Lo Inc. Res.
___ P092 Lo RMERC Res.
___ P092 Not Inc/RMERC Res.
___ P092 Hi Inc//RMERC Res.
___ U151 Lo RMERC Res.
___ U151 Lo Not RMERC Res.
___ U151 Hi Hg
___ U240 2, 4 D
___ U240 2, 4 esters & Salts

The subcategory for D018-D043 waste is "treated in nonCWA/nonSDWA facility" unless the following box is checked: ☐ "treated in CWA/SDWA facility"

3. COMMON CODES (Place appropriate letter from section 8 before each code that applies)

___ D002 ___ D004 ___ D020 ___ D036 ___ U007
___ P012 ___ D005 ___ D021 ___ D037 ___ U044
___ P030 ___ D006 ___ D022 ___ D038 ___ U061
___ P051 ✓ ___ D007 ___ D023 ___ D039 ___ U072
___ P098 ✓ ___ D008 ___ D024 ___ D040 ___ U080
___ P105 ___ D009 ___ D025 ___ D041 ___ U108
___ P205 ___ D010 ___ D026 ___ D042 ___ U117
___ F006 ___ D011 ___ D027 ___ D043 ___ U122
___ F007 ___ D012 ___ D028 ___ F001 ___ U123
___ F008 ___ D013 ___ D029 ___ F002 ___ U136
___ F009 ___ D014 ___ D030 ___ F003 ___ U154
___ F010 ___ D015 ___ D031 ___ F004 ___ U188
___ F011 ___ D016 ___ D032 ___ F005 ___ U213
___ F012 ___ D017 ___ D033 ___ U002 ___ U220
___ F019 ___ D018 ___ D034 ___ U003 ___ U226
___ F039 ___ D019 ___ D035 ___ U006 ___ U279 ___ K061

ADDITIONAL CODES (Enter all codes not identified above which are associated with waste)

4. USEPA HAZARDOUS WASTE CODE(S)	5. TREATMENT STANDARDS FOR NON-PHASE II STATES (INDICATE THE APPLICABLE TREATMENT STANDARD 268.41, 268.43 OR SPECIFIED TECHNOLOGY BELOW)	6. HOW MUST THE WASTE BE MANAGED? ENTER THE LETTER FROM BELOW

To identify F039, or UHCs managed in non-CWA, use the "F039/Underlying Hazardous Constituents Form" provided and check here: ☐
If no UHCs are present upon generation check here: ☐ Check here if disposal facility will check for all UHCs ☐ (i.e. no UHC form required)
To list additional EPA waste code(s), use the supplemental sheet and check here: ☐ In lieu of supplemental sheet you may use multiple copies of this form.

7. SOLVENT CONSTITUENTS (F001 - F005) Check here if disposal facility will check for all spent solvents ___

___ Acetone
___ Carbon Tetrachloride
___ Cyclohexanone
___ Ethyl benzene
___ Methylene chloride
___ 2-Nitropropane
___ 1,1,1 Trichloroethane
___ Trichloromonofluoromethane
___ Benzene
___ Chlorobenzene
___ o-Dichlorobenzene
___ Ethyl ether
___ Methyl ethyl ketone
___ Pyridine
___ 1, 1, 2-Trichloroethane
___ Xylenes
___ n-Butyl alcohol
___ O-Cresol
___ 2-Ethoxyethanol
___ Isobutanol
___ Methyl isobutyl ketone
___ Tetrachloroethylene
___ 1, 1, 2-Trichloro, 1, 2, 2-trifluoroethane
___ Carbon disulfide
___ Cresols (m&p)
___ Ethyl acetate
___ Methanol
___ Nitrobenzene
___ Toluene
___ Trichloroethylene

8. (States authorized by EPA to manage the LDR program may have regulatory citations different from the 40 CFR citations listed below. Where these regulatory citations differ, your certification will be deemed to refer to those state citations instead of the 40 CFR citations.)

A. or ✓ RESTRICTED WASTE REQUIRES TREATMENT
This waste must be treated to the applicable treatment standards set forth in 40 CFR Part 268.40.
☐ For Hazardous Debris: "This hazardous debris is subject to the alternative treatment standards of 40 CFR 268.45."

B.1 RESTRICTED WASTE TREATMENT TO PERFORMANCE STANDARDS
"I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification. Based on my inquiry of those individuals immediately responsible for obtaining this information, I believe that the treatment process has been operated and maintained properly so as to comply with the treatment standards specified in 40 CFR 268.40 without impermissible dilution of the prohibited waste. I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment."

B.2 (CERTIFICATION REMOVED BY PHASE IV)

B.3 GOOD FAITH AND ANALYTICAL CERTIFICATION - FOR INCINERATED ORGANICS
"I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification. Based on my inquiry of those individuals immediately responsible for obtaining this information, I believe that the nonwastewater organic constituents have been treated by combustion units as specified in 268.42, Table 1. I have been unable to detect the nonwastewater organic constituents, despite having used best good faith efforts to analyze for such constituents. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment."

B.4 DECHARACTERIZED WASTE REQUIRES TREATMENT FOR UNDERLYING HAZARDOUS CONSTITUENTS
"I certify under penalty of law that the waste has been treated in accordance with the requirements of 40 CFR 268.40 to remove the hazardous characteristic. This decharacterized waste contains underlying hazardous constituents that require further treatment to meet universal treatment standards. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment."

C. RESTRICTED WASTE SUBJECT TO A VARIANCE
This waste is subject to a national capacity variance, a treatability variance, or a case-by-case extension. Enter the effective date of prohibition in column 5 above.
☐ For hazardous debris: "This hazardous debris is subject to the alternative treatment standards of 40 CFR 268.45."

D. RESTRICTED WASTE CAN BE LAND DISPOSED WITHOUT FURTHER TREATMENT
"I certify under penalty of law that I have personally examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this certification that the waste complies with the treatment standards specified in 40 CFR Part 268 Subpart D. I believe that the information I submitted is true, accurate and complete. I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment."

E. WASTE NOT CURRENTLY SUBJECT TO PART 268 RESTRICTIONS
This waste is a newly identified waste that is not currently subject to any 40 CFR Part 268 restrictions.

I hereby certify that all information in this and all associated documents is complete and accurate, to the best of my knowledge and information.

Signature X Bob Polzer

Title ENVIR ENGR Date 1/16/03

FORM # OES-78B

State of California—Environmental Protection Agency
Form Approved OMB No. 2050–0039 (Expires 9-30-99)
Please print or type. *Form designed for use on elite (12-pitch) typewriter.*

See Instructions on back of page 6.

Department of Toxic Substances Control
Sacramento, California

22702345

IN CASE OF EMERGENCY OR SPILL, CALL THE NATIONAL RESPONSE CENTER 1-800-424-8802: WITHIN CALIFORNIA, CALL 1-800-852-7550

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: CA717002477 5
Manifest Document No.: 0 3 0 2 1
2. Page 1 of 1
Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
NAVY-MARE ISLAND- CSO EFAW
P O BOX 2193 BLDG. 535
VALLEJO, CA 94592-0193

4. Generator's Phone (707) 646-6363

A. State Manifest Document Number: 22702345

B. State Generator's ID:

5. Transporter 1 Company Name: ONYX ENVIRONMENTAL SVCS L L C

6. US EPA ID Number: NJD080631369

C. State Transporter's ID [Reserved.]

D. Transporter's Phone: (973) 347-7111

7. Transporter 2 Company Name:

8. US EPA ID Number:

E. State Transporter's ID [Reserved.]

F. Transporter's Phone:

9. Designated Facility Name and Site Address
CHEMICAL WASTE MANAGEMENT, INC
35251 OLD SKYLINE ROAD
P O BOX 471
KETTLEMAN CITY, CA 93239

10. US EPA ID Number: CAT000646117

G. State Facility's ID:

H. Facility's Phone: (559) 386-9711

11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste Number
a. HAZARDOUS WASTE, LIQUID, n.o.s., (LEAD, CHROMIUM), 9, NA3082, III	001	DM	00200	P	State 611 ~~343~~ FW; EPA/Other D007
b. NON-RCRA HAZARDOUS WASTE SOLID, (EMPTY CONTAINERS, CLAY), NONE, NONE	001	DM	00150	P	State 611 ~~332~~ FW; EPA/Other NONE
c.					State; EPA/Other
d.					State; EPA/Other

J. Additional Descriptions for Materials Listed Above
A) L/E WASTE WATER
B) S/- DEBRIS

K. Handling Codes for Wastes Listed Above
a. b.
c. d.

15. Special Handling Instructions and Additional Information
PACKING SLIPS ATTACHED FOR CLARIFICATION - EMERGENCY NUMBER-INFOTRAC 1-800-535-5053

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month	Day	Year
RANDALL R. ANDERSON	Randall R. Anderson	11	18	03

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
FRED WIESEMAN	Fred Wieseman	11	18	03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year

GENERATOR / TRANSPORTER / FACILITY

DO NOT WRITE BELOW THIS LINE.

DTSC 8022A (1/99)
EPA 8700—22

White: TSDF SENDS THIS COPY TO DTSC WITHIN 30 DAYS.
To: P.O. Box 3000, Sacramento, CA 95812

ONYX ENVIRONMENTAL SERVICES
ONYX

Activity Report

JOB NO 0401850000 WO NO 0401850000
BILL DOC NO C531118704
GENERATOR NO 422883 EPA ID CA7170024775

BILL TO TETRA TECH EM INC.
135 MAIN STREET
SUITE 1800
SAN FRANCISCO, CA 94105-0400

JOB SITE NAVY-MARE ISLAND- CS0 EFAW
P.O. BOX 2193 BLDG. 535
VALLEJO, CA 94592-0193

CONTACT LARRY HERNANDEZ

CONTACT BOB PALMER (NAVY)

MANIFEST NUMBER(S)
22702345

CUSTOMER P.O. NUMBER	PROJECT NUMBER	SHIP DATE	TERR.
		11/18/2003	C40

DESCRIPTION	# CONT	CONT. CODE	QTY	UOM	PG LN	WASTE AREA
9743204/HFBM7200 - MISCELLANEOUS DEBRIS CONTAM W/TPH	1	551A2-DM	150	P	1B	
809570/KHFEB5470 - RCRA WASTEWATER-CHROMIUM & LEAD & TPH	1	551A2-DM	200	P	1A	
Manpwr - FIELD SUPERVISOR		125	1@1.5	HOUR		
Manpwr - MOBILIZATION FEE		1246	1@0.5	EACH		
Manpwr - SERVICE VEHICLE CHARGE		1317	1@1	EACH		

Total Hours 1.5
# of Containers 2
Total Pounds 350

Comments:

By: [signature]

ONYX Environmental Services is permitted for and has capacity to accept waste listed above in container quantities

FORM# OES-6

ONYX ENVIRONMENTAL SERVICES

Land Disposal Restriction Notification Form

Generator Name: NAVY-MARE ISLAND- CS0 EFAW

EPA ID Number: CA7170024775 Manifest: 22702345

This notice is being provided in accordance with 40 CFR 268.7 to inform you that this shipment contains waste restricted from land disposal by the USEPA under the land disposal restriction program. Identified below for each container is the designation of the waste as a wastewater or non-wastewater, the Clean Water Act (CWA) permit status associated with the treatment/disposal facility, applicable waste codes and any corresponding subcategories, list of any F001-F005 solvent constituents that are present in the waste, and any underlying hazardous constituents (UHC) that are present.

Container Number: **C5-0401850000-002**

WIP / Approval Code:	**609570 / KHFEB5470**
Form Designation / CWA Status:	**Non-Wastewater / Non-CWA**
Waste Codes (Subcategories):	**D007, D008 (NONE)**
Constituents (F001 - F005):	**None**
UHCs Present:	**None**
Treatment Requirements:	**Restricted waste requires treatment to applicable standards.**
Additional Notices:	

I hearby certify that all information in this and associated land disposal restriction documents is complete and accurate to the best of my knowledge and information.

Signature: [illegible]

Title: Facility Engr. Date: 11/18/03

FORM# OES-6

ONYX ENVIRONMENTAL SERVICES

INCOMING PACKING SUMMARY

Generator Number: 422983
NAVY-MARE ISLAND- CS0 EFAW
P.O. BOX 2193 BLDG. 535
VALLEJO, CA 94592-0193
Attn: BOB PALMER (NAVY)
EPA ID: CA7170024775

Manifest Number: 22702345
Field System ID: C5
Work Order Number: 0401850000
Date Shipped: 11/18/2003
Document Number: 03021

Container#: C5-0401850000-002 Waste Area: Manifest Page/Line: 01 / A

WIP: 609570 DisposalCode: KHFEB5470 PHY State: L

Date Accumulated: 11/18/2003 Special Handling: Gen Drum ID:

Shipping Name: HAZARDOUS WASTE, LIQUID, n.o.s., (LEAD, CHROMIUM), 9, NA3082, III

No. of Commons: 01 Outer Container: 551A2-DM Inner Container:

Primary Waste Codes: D007, D008

Total Cmns Wt: 200 SIC: 9199 Source: G14 Form: W219 System: H111 Cubic Ft.: 7.50

Units	Container Size	Net Weight	Chemical Name
1	55 GAL	METAL	CHROMIUM [5-50M] LEAD [5-50M] WATER [75-100%] SOIL [0-25%] TPH [0-5%]

Container#: C5-0401850000-001 Waste Area: Manifest Page/Line: 01 / B

WIP: 974320 DisposalCode: KHFBM7200 PHY State: S

Date Accumulated: 11/18/2003 Special Handling: Gen Drum ID:

Shipping Name: NON-RCRA HAZARDOUS WASTE SOLID, (EMPTY CONTAINERS, CLAY), NONE, NONE

No. of Commons: 01 Outer Container: 551A2-DM Inner Container:

Primary Waste Codes:

Total Cmns Wt: 150 SIC: 9199 Source: G49 Form: W301 System: H132 Cubic Ft.: 7.50

Units	Container Size	Net Weight	Chemical Name
1	55 GAL	METAL	FILTERS [0-100%] RCRA EMPTY, CRUSHED CONTAINERS [0-100%] NON-BIOGRADABLE CLAY BASED ABSORBENT [0-99%] DEBRIS (INCLUDING, BUT NOT LIMITED TO: BOOMS, PPE, [0-1%] FILTER, RAGS, WIRE, STAINLESS STEEL, WOOD, [0-1%] CONCRETE, ASPHALT, PIPING, HOSES, METAL SHAVINGS, [0-1%] PAPER) [0-100%] SOIL/ SAND [0-100%] GASOLINE/ DIESEL/ OIL/ ETHYLENE GLYCOL/ T [0-20%] FUEL/ KEROSENE [0-1%] NON-FRIABLE ASBESTOS [0-5%] BRAZE SALTS [0-10%] ALUMINA BEADS (1/2 INCH DIAMETER) [0-80%] RUSTY METAL SCALE [0-100%] POLYMER SOLIDS [0-50%]

FORM# OES-6

Curtis & Tompkins, Ltd

California Title 26 Metals

Lab #:	167886	Project#:	G90160640301
Client:	Tetra Tech EMI	Location:	MareIsland SchoolYard Inv
Field ID:	MINSOIL2-IDW	Basis:	dry
Lab ID:	167886-001	Diln Fac:	1.000
Matrix:	Soil	Sampled:	09/30/03
Units:	mg/Kg	Received:	09/30/03

Moisture: 12%

Analyte	Result	RL	Batch#	Prepared	Analyzed	Prep	Analysis
Antimony	ND	3.0	85010	10/02/03	10/11/03	EPA 3050	EPA 6010B
Arsenic	7.9	0.25	85010	10/02/03	10/11/03	EPA 3050	EPA 6010B
Barium	120	0.49	85010	10/02/03	10/11/03	EPA 3050	EPA 6010B
Beryllium	0.41	0.098	85010	10/02/03	10/11/03	EPA 3050	EPA 6010B
Cadmium	0.61	0.25	85010	10/02/03	10/11/03	EPA 3050	EPA 6010B
Chromium	17	0.49	85010	10/02/03	10/11/03	EPA 3050	EPA 6010B
Cobalt	7.8	0.98	85010	10/02/03	10/11/03	EPA 3050	EPA 6010B
Copper	18	0.49	85010	10/02/03	10/11/03	EPA 3050	EPA 6010B
Lead	7.3	0.15	85010	10/02/03	10/11/03	EPA 3050	EPA 6010B
Mercury	0.026	0.021	85196	10/09/03	10/09/03	METHOD	EPA 7471
Molybdenum	0.58 J	0.98	85010	10/02/03	10/11/03	EPA 3050	EPA 6010B
Nickel	19	0.98	85010	10/02/03	10/11/03	EPA 3050	EPA 6010B
Selenium	0.38	0.25	85010	10/02/03	10/11/03	EPA 3050	EPA 6010B
Silver	ND	0.25	85010	10/02/03	10/11/03	EPA 3050	EPA 6010B
Thallium	0.86	0.25	85010	10/02/03	10/11/03	EPA 3050	EPA 6010B
Vanadium	28	0.49	85010	10/02/03	10/11/03	EPA 3050	EPA 6010B
Zinc	53	0.98	85010	10/02/03	10/11/03	EPA 3050	EPA 6010B

J= Estimated value
ND= Not Detected
RL= Reporting Limit

5

Curtis & Tompkins, Ltd

Purgeable Organics by GC/MS

Lab #:	167886	Location:	MareIsl.nd S:hoolYard Inv
Client:	Terra Tech EMI	Prep:	EPA 503.0B
Project#:	G90160640301	Analysis:	EPA 826.0B
Field ID:	MINSOIL2-IDW	Diln Fac:	1.000
Lab ID:	167886-001	Batch#:	84981
Matrix:	Soil	Sampled:	09/30/0
Units:	ug/Kg	Received:	09/30/0
Basis:	dry	Analyzed:	10/01/0

Analyte	Result	RL
2-Chlorotoluene	ND	5.7
4-Chlorotoluene	ND	5.7
tert-Butylbenzene	ND	5.7
1,2,4-Trimethylbenzene	ND	5.7
sec-Butylbenzene	ND	5.7
para-Isopropyl Toluene	ND	5.7
1,3-Dichlorobenzene	ND	5.7
1,4-Dichlorobenzene	ND	5.7
n-Butylbenzene	ND	5.7
1,2-Dichlorobenzene	ND	5.7
1,2-Dibromo-3-Chloropropane	ND	5.7
1,2,4-Trichlorobenzene	ND	5.7
Hexachlorobutadiene	ND	5.7
Naphthalene	ND	5.7
1,2,3-Trichlorobenzene	ND	5.7

Surrogate	%REC	Limits
Dibromofluoromethane	96	63-133
1,2-Dichloroethane-d4	106	76-130
Toluene-d8	101	80-111
Bromofluorobenzene	95	77-126

J= Estimated value
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

California Title 26 Metals

Lab #:	167886	Location:	MareIsland SchoolYard Inv
Client:	Tetra Tech EMI	Prep:	EPA 3050
Project#:	G90160640301	Analysis:	EPA 6010B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC227644	Batch#:	85010
Matrix:	Soil	Prepared:	10/02/03
Units:	mg/Kg	Analyzed:	10/11/03
Basis:	as received		

Analyte	Result	RL
Antimony	ND	3.0
Arsenic	0.13 J	0.25
Barium	ND	0.50
Beryllium	ND	0.10
Cadmium	ND	0.25
Chromium	ND	0.50
Cobalt	ND	1.0
Copper	ND	0.50
Lead	ND	0.15
Molybdenum	ND	1.0
Nickel	ND	1.0
Selenium	ND	0.25
Silver	ND	0.25
Thallium	ND	0.25
Vanadium	ND	0.50
Zinc	ND	1.0

J= Estimated value
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd

California Title 26 Metals

Lab #:	167886	Location:	MareIsland SchoolYard Inv
Client:	Tetra Tech EMI	Prep:	METHOD
Project#:	G90160640301	Analysis:	EPA 7471
Analyte:	Mercury	Basis:	as received
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC228388	Batch#:	85196
Matrix:	Soil	Prepared:	10/09/03
Units:	mg/Kg	Analyzed:	10/09/03

Result	RL
ND	0.020

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd

Purgeable Organics by GC/MS

Lab #:	167886	Location:	MareIsland SchoolYard Inv
Client:	Tetra Tech EMI	Prep:	EPA 5030B
Project#:	G90160640301	Analysis:	EPA 8260B
Type:	BLANK	Basis:	as received
Lab ID:	QC227542	Diln Fac:	1.000
Matrix:	Soil	Batch#:	84981
Units:	ug/Kg	Analyzed:	10/01/03

Analyte	Result	RL
Freon 12	ND	10
Chloromethane	ND	10
Vinyl Chloride	ND	10
Bromomethane	ND	10
Chloroethane	ND	10
Trichlorofluoromethane	ND	5.0
Acetone	ND	20
Freon 113	ND	5.0
1,1-Dichloroethene	ND	5.0
Methylene Chloride	0.9 J	20
Carbon Disulfide	ND	5.0
MTBE	ND	5.0
trans-1,2-Dichloroethene	ND	5.0
Vinyl Acetate	ND	50
1,1-Dichloroethane	ND	5.0
2-Butanone	ND	10
cis-1,2-Dichloroethene	ND	5.0
2,2-Dichloropropane	ND	5.0
Chloroform	ND	5.0
Bromochloromethane	ND	5.0
1,1,1-Trichloroethane	ND	5.0
1,1-Dichloropropene	ND	5.0
Carbon Tetrachloride	ND	5.0
1,2-Dichloroethane	ND	5.0
Benzene	ND	5.0
Trichloroethene	ND	5.0
1,2-Dichloropropane	ND	5.0
Bromodichloromethane	ND	5.0
Dibromomethane	ND	5.0
4-Methyl-2-Pentanone	ND	10
cis-1,3-Dichloropropene	ND	5.0
Toluene	ND	5.0
trans-1,3-Dichloropropene	ND	5.0
1,1,2-Trichloroethane	ND	5.0
2-Hexanone	ND	10
1,3-Dichloropropane	ND	5.0
Tetrachloroethene	ND	5.0

J= Estimated value
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd

Purgeable Organics by GC/MS

Lab #:	167886	Location:	MareIsland SchoolYard Inv
Client:	Tetra Tech EMI	Prep:	EPA 5030B
Project#:	G90160640301	Analysis:	EPA 8260B
Type:	BLANK	Basis:	as received
Lab ID:	QC227542	Diln Fac:	1.000
Matrix:	Soil	Batch#:	84981
Units:	ug/Kg	Analyzed:	10/01/03

Analyte	Result	RL
Dibromochloromethane	ND	5.0
1,2-Dibromoethane	ND	5.0
Chlorobenzene	ND	5.0
1,1,1,2-Tetrachloroethane	ND	5.0
Ethylbenzene	ND	5.0
m,p-Xylenes	ND	5.0
o-Xylene	ND	5.0
Styrene	ND	5.0
Bromoform	ND	5.0
Isopropylbenzene	ND	5.0
1,1,2,2-Tetrachloroethane	ND	5.0
1,2,3-Trichloropropane	ND	5.0
Propylbenzene	ND	5.0
Bromobenzene	ND	5.0
1,3,5-Trimethylbenzene	ND	5.0
2-Chlorotoluene	ND	5.0
4-Chlorotoluene	ND	5.0
tert-Butylbenzene	ND	5.0
1,2,4-Trimethylbenzene	ND	5.0
sec-Butylbenzene	ND	5.0
para-Isopropyl Toluene	ND	5.0
1,3-Dichlorobenzene	ND	5.0
1,4-Dichlorobenzene	ND	5.0
n-Butylbenzene	ND	5.0
1,2-Dichlorobenzene	ND	5.0
1,2-Dibromo-3-Chloropropane	ND	5.0
1,2,4-Trichlorobenzene	ND	5.0
Hexachlorobutadiene	ND	5.0
Naphthalene	0.9 J	5.0
1,2,3-Trichlorobenzene	ND	5.0

Surrogate	%REC	Limits
Dibromofluoromethane	95	63-133
1,2-Dichloroethane-d4	103	76-130
Toluene-d8	100	80-111
Bromofluorobenzene	94	77-126

J= Estimated value
ND= Not Detected
RL= Reporting Limit

Tetra Tech EM Inc.
San Francisco Office
135 Main St. Suite 1800
San Francisco. CA 94105
415-543-4880
Fax 415-543-5480

Chain of Custody Record No. 4793

4793

Lab PO#: 032241	Lab: CURTIS & THOMPKINS	
Project name: MARE ISLAND IDW	TtEMI technical contact: WILLIAM WARREN	Field samplers: RAFAEL LAGO/WILL WARREN
Project (CTO) number: G9016064030	TtEMI project manager: RAFAEL LAGO	Field samplers' signatures: [signature]

Preservative Added

No./Container Types

Analysis Required

Sample ID	Sample Location (Pt. ID)	Date	Time	Matrix	MS / MSD	40 ml VOA	1 liter Amber	500 ml Poly	Sleeve	Glass Jar 8 oz	VOA	SVOA	Pest/PCBs	Metals	TPH Purgeables	TPH Extractables
MINSOIL2 -- IDW		9/30/03	1116	SOIL						4	X	—		X		

William Warren
9-30-03

	Name (print)	Company Name	Date	Time
Relinquished by: [signature]	RAFAEL LAGO	TtEMI	9/30/03	1500
Received by: [signature]	A. Alvarez	CT	9/30/03	5:00pm
Relinquished by:				
Received by:				
Relinquished by:				
Received by:				

Turnaround time/remarks:

SEE PO

Received ☑ On ice ☑ Cold ☐ Ambient ☑ Intact

Fed Ex #:

WHITE-Laboratory Copy YELLOW-Sample Tracker PINK-File Copy

Tetra Tech EM Inc.
San Francisco Office
135 Main St. Suite 1800
San Francisco. CA 94105
415-543-4880
Fax 415-543-5480

Chain of Custody Record No. 4793

4193

Project name:	Lab PO#:	Lab:
Project (CTO) number:	TtEMI technical contact:	Field samplers:
	TtEMI project manager:	Field samplers' signatures:

Sample ID	Sample Location (Pt. ID)	Date	Time	Matrix	MS / MSD	40 ml VOA	1 liter Amber	500 ml Poly	Sleeve	Glass Jar				VOA	SVOA	Pest/PCBs	Metals	TPH Purgeables	TPH Extractables
										1				X			X		

Preservative Added

No./Container Types

Analysis Required

	Name (print)	Company Name	Date	Time
Relinquished by:				
Received by:				
Relinquished by:				
Received by:				
Relinquished by:				
Received by:				

Turnaround time/remarks:

Fed Ex #:

WHITE-Laboratory Copy YELLOW-Sample Tracker PINK-File Copy

167886

Tetra Tech EM Inc.
San Francisco Office
135 Main St. Suite 1800
San Francisco, CA 94105
415-543-4880
Fax 415-543-5480

Chain of Custody Record No. 4793

Page 1 of 1

4793

Preservative Added

Lab PO#: 032241	Lab: CURTIS & TOMPKINS	
Project name: MARK ISLAND IDW	TtEMI technical contact: WILLIAM WARREN	Field samplers: RAFAEL LAGO/WILL WARREN
Project (CTO) number: G9016064030 1	TtEMI project manager: RAFAEL LAGO	Field samplers' signatures: [signature]

No./Container Types

Analysis Required

Sample ID	Sample Location (Pt. ID)	Date	Time	Matrix	MS / MSD	40 ml VOA	1 liter Amber	500 ml Poly	Sleeve	Glass Jar 8 oz	VOA	SVOA	Pest/PCBs	Metals	TPH Purgeables	TPH Extractables
MINSOIL2-IDW		9/30/03	1116	SOIL						4	X			X		

William Warren
9-30-03

	Name (print)	Company Name	Date	Time
Relinquished by: [signature]	RAFAEL LAGO	TtEMI	9/30/03	1500
Received by: [signature]	A. Alvarez	CT	9/30/03	5:00pm
Relinquished by:				
Received by:				
Relinquished by:				
Received by:				

Turnaround time/remarks:

SEE PO

Received ☑ Cold ☐ Ambient ☑ Ice ☑ Intact

Fed Ex #:

Oct-14-03 08:48am From-CURTIS & TOMPKINS 5104860532 T-472 P.02/10 F-569

SOP Volume: Client Services
Section: 1.1.2
Page: 1 of 1
Effective Date: 10-May-99
Revision: 1 Number 3 of 3
Filename: F:\QC\Forms\QC\Cooler.wpd

Curtis & Tompkins, Ltd.

COOLER RECEIPT CHECKLIST

Login#: 167886 Date Received: 9/30/03 Number of Coolers: 1
Client: ITEMI Project: 6980160640301

A. Preliminary Examination Phase
Date Opened: 9/30/03 By (print): Peter Petricka (sign) [signature]

1. Did cooler come with a shipping slip (airbill, etc.)? ..... YES (NO)
   If YES, enter carrier name and airbill number: _____
2. Were custody seals on outside of cooler? ..... YES (NO)
   How many and where? _____ Seal date: _____ Seal name: _____
3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES NO
4. Were custody papers dry and intact when received? ..... (YES) NO
5. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO
6. Did you sign the custody papers in the appropriate place? ..... YES NO
7. Was project identifiable from custody papers? ..... (YES) NO
   If YES, enter project name at the top of this form.
8. If required, was sufficient ice used? Samples should be 2-6 degrees C. ..... YES NO
   Type of ice: WET IN ZIPLOC Temperature: 15°

B. Login Phase
Date Logged In: 9/30/03 By (print): Peter Petricka (sign) [signature]

1. Describe type of packing in cooler: Zip Lock
2. Did all bottles arrive unbroken? ..... (YES) NO
3. Were labels in good condition and complete (ID, date, time, signature, etc.)? ..... (YES) NO
4. Did bottle labels agree with custody papers? ..... (YES) NO
5. Were appropriate containers used for the tests indicated? ..... (YES) NO
6. Were correct preservatives added to samples? ..... YES NO N/A
7. Was sufficient amount of sample sent for tests indicated? ..... (YES) NO
8. Were bubbles absent in VOA samples? If NO, list sample Ids below ..... YES NO N/A
9. Was the client contacted concerning this sample delivery? ..... YES NO
   If YES, give details below.
   Who was called? _____ By whom? _____ Date: _____

Additional Comments:
A.8 - Samples from field cooling process had begun.

Curtis & Tompkins, Ltd

Purgeable Organics by GC/MS

Lab #:	167886	Location:	MareIsland SchoolYard Inv
Client:	Tetra Tech EMI	Prep:	EPA 5030c
Project#:	G90160640301	Analysis:	EPA 8260b
Field ID:	MINSOIL2-IDW	Diln Fac:	1.000
Lab ID:	167886-001	Batch#:	84981
Matrix:	Soil	Sampled:	05/30/03
Units:	ug/kg	Received:	09/30/03
Basis:	dry	Analyzed:	10/01/03

Moisture: 12%

Analyte	Result	RL
Freon 12	ND	11
Chloromethane	ND	11
Vinyl Chloride	ND	11
Bromomethane	ND	11
Chloroethane	ND	11
Trichlorofluoromethane	ND	5.7
Acetone	ND	23
Freon 113	ND	5.7
1,1-Dichloroethene	ND	5.7
Methylene Chloride	6.8 J	23
Carbon Disulfide	ND	5.7
MTBE	ND	5.7
trans-1,2-Dichloroethene	ND	5.7
Vinyl Acetate	ND	57
1,1-Dichloroethane	ND	5.7
2-Butanone	ND	11
cis-1,2-Dichloroethene	ND	5.7
2,2-Dichloropropane	ND	5.7
Chloroform	ND	5.7
Bromochloromethane	ND	5.7
1,1,1-Trichloroethane	ND	5.7
1,1-Dichloropropene	ND	5.7
Carbon Tetrachloride	ND	5.7
1,2-Dichloroethane	ND	5.7
Benzene	ND	5.7
Trichloroethene	ND	5.7
1,2-Dichloropropane	ND	5.7
Bromodichloromethane	ND	5.7
Dibromomethane	ND	5.7
4-Methyl-2-Pentanone	ND	11
cis-1,3-Dichloropropene	ND	5.7
Toluene	ND	5.7
trans-1,3-Dichloropropene	ND	5.7
1,1,2-Trichloroethane	ND	5.7
2-Hexanone	ND	11
1,3-Dichloropropane	ND	5.7
Tetrachloroethene	ND	5.7
Dibromochloromethane	ND	5.7
1,2-Dibromoethane	ND	5.7
Chlorobenzene	ND	5.7
1,1,1,2-Tetrachloroethane	ND	5.7
Ethylbenzene	ND	5.7
m,p-Xylenes	ND	5.7
o-Xylene	ND	5.7
Styrene	ND	5.7
Bromoform	ND	5.7
Isopropylbenzene	ND	5.7
1,1,2,2-Tetrachloroethane	ND	5.7
1,2,3-Trichloropropane	ND	5.7
Propylbenzene	ND	5.7
Bromobenzene	ND	5.7
1,3,5-Trimethylbenzene	ND	5.7

J= Estimated value
ND= Not Detected
RL= Reporting Limit

APPENDIX D
PHOTOGRAPHS

51 pages.

PHOTOGRAPH D-1: GRASSY PLAYGROUND AREA MARE ISLAND ELEMENTARY SCHOOL SITE BEFORE SAMPLING

PHOTOGRAPH D-2: GRASSY PLAYGROUND AREA MARE ISLAND ELEMENTARY SCHOOL SITE BEFORE SAMPLING

PHOTOGRAPH D-3: GRASSY PLAYGROUND AREA MARE ISLAND ELEMENTARY SCHOOL SITE BEFORE SAMPLING

PHOTOGRAPH D-4: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE A7

PHOTOGRAPH D-5: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE A8

PHOTOGRAPH D-6: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE B1

PHOTOGRAPH D-7: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE B2

PHOTOGRAPH D-8: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE B3

PHOTOGRAPH D-9: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE B4

PHOTOGRAPH D-10: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE B5

PHOTOGRAPH D-11: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE B6

PHOTOGRAPH D-12: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE B7

PHOTOGRAPH D-13: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE B8

PHOTOGRAPH D-14: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE B9

PHOTOGRAPH D-15: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE C1

PHOTOGRAPH D-16: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE C2

PHOTOGRAPH D-17: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE C3

PHOTOGRAPH D-18: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE C4

PHOTOGRAPH D-19: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE C5

PHOTOGRAPH D-20: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE C6

PHOTOGRAPH D-21: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE C7

PHOTOGRAPH D-22: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE C8

PHOTOGRAPH D-23: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE C9

PHOTOGRAPH D-24: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE C10

PHOTOGRAPH D-25: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE C11

PHOTOGRAPH D-26: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE D1

PHOTOGRAPH D-27: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE D3

PHOTOGRAPH D-28: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE D4

PHOTOGRAPH D-29: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE D5

PHOTOGRAPH D-30: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE D7

PHOTOGRAPH D-31: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE D8

PHOTOGRAPH D-32: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE D9

PHOTOGRAPH D-33: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE D10

PHOTOGRAPH D-34: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE D11

PHOTOGRAPH D-35: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE D12

PHOTOGRAPH D-36: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE E1

PHOTOGRAPH D-37: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE E2

PHOTOGRAPH D-38: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE E3

PHOTOGRAPH D-39: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE E4

PHOTOGRAPH D-40: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE E5

PHOTOGRAPH D-41: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE E6

PHOTOGRAPH D-42: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE E7

PHOTOGRAPH D-43: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE E8

PHOTOGRAPH D-44: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE E9

PHOTOGRAPH D-45: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE E10

PHOTOGRAPH D-46: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE E11

PHOTOGRAPH D-47: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE F1

PHOTOGRAPH D-48: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE F2

PHOTOGRAPH D-49: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE F3

PHOTOGRAPH D-50: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE F4

PHOTOGRAPH D-51: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE F5

PHOTOGRAPH D-52: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE F6

PHOTOGRAPH D-53: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE F7

PHOTOGRAPH D-54: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE F8

PHOTOGRAPH D-55: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE F10

PHOTOGRAPH D-56: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE G1

PHOTOGRAPH D-57: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE G2

PHOTOGRAPH D-58: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE G3

PHOTOGRAPH D-59: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE G4

PHOTOGRAPH D-60: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE G5

PHOTOGRAPH D-61: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE G6

PHOTOGRAPH D-62: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE G7

PHOTOGRAPH D-63: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE G8

PHOTOGRAPH D-64: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE G9

PHOTOGRAPH D-65: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE H1

PHOTOGRAPH D-66: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE H2

PHOTOGRAPH D-67: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE H3

PHOTOGRAPH D-68: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE H4

PHOTOGRAPH D-69: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE H5

PHOTOGRAPH D-70: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE H6

PHOTOGRAPH D-71: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE H7

PHOTOGRAPH D-72: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE H8

PHOTOGRAPH D-73: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE I1

PHOTOGRAPH D-74: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE I2

PHOTOGRAPH D-75: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE I4

PHOTOGRAPH D-76: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE I5

PHOTOGRAPH D-77: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE I6

PHOTOGRAPH D-78: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE J2

PHOTOGRAPH D-79: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE J3

PHOTOGRAPH D-80: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE J4

FIGURE D-81: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE J5

FIGURE D-82: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE K2

PHOTOGRAPH D-83: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE K3

PHOTOGRAPH D-84: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE L1

PHOTOGRAPH D-85: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE L2

PHOTOGRAPH D-86: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE M1

PHOTOGRAPH D-87: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE N1

PHOTOGRAPH D-88: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE S1

PHOTOGRAPH D-89: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE S2

PHOTOGRAPH D-90: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE S3

PHOTOGRAPH D-91: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE S4

PHOTOGRAPH D-92: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE S5

PHOTOGRAPH D-93: MARE ISLAND ELEMENTARY SCHOOL SITE VISUAL INSPECTION SAMPLE S6

PHOTOGRAPH D-94: GRASSY PLAYGROUND AREA MARE ISLAND ELEMENTARY SCHOOL SITE AFTER SAMPLING

PHOTOGRAPH D-95: GRASSY PLAYGROUND AREA MARE ISLAND ELEMENTARY SCHOOL SITE AFTER SAMPLING

PHOTOGRAPH D-96: GRASSY PLAYGROUND AREA MARE ISLAND ELEMENTARY SCHOOL SITE AFTER SAMPLING

PHOTOGRAPH D-97: GRASSY PLAYGROUND AREA MARE ISLAND ELEMENTARY SCHOOL SITE AFTER SAMPLING

PHOTOGRAPH D-98: GRASSY PLAYGROUND AREA MARE ISLAND ELEMENTARY SCHOOL SITE AFTER SAMPLING

PHOTOGRAPH D-99: GRASSY PLAYGROUND AREA MARE ISLAND ELEMENTARY SCHOOL SITE AFTER SAMPLING

PHOTOGRAPH D-100: GRASSY PLAYGROUND AREA MARE ISLAND ELEMENTARY SCHOOL SITE AFTER SAMPLING

PHOTOGRAPH D-101: GRASSY PLAYGROUND AREA MARE ISLAND ELEMENTARY SCHOOL SITE AFTER SAMPLING

APPENDIX E
BORING LOGS

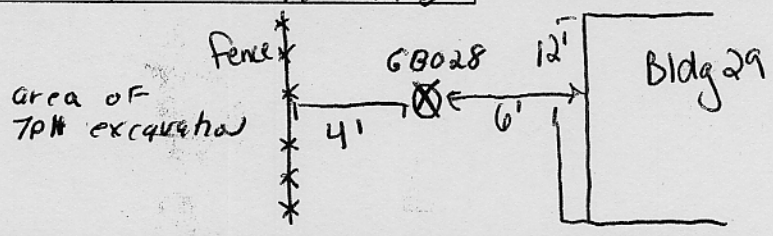
33 pages.

TETRA TECH EM INC.

SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

CTO:
Bldg./Site: Mare Island
Project Name: Elementary School Site

Boring Number: ELEM GB028	Date Started: 8/19/03
Drilling Method: (*Circle one*) HSA Continuous Core/GeoProbe/Hand Auger	Date Completed: 8/19/03
Air Rotary/Mud Rotary/Dual Tube Percussion/Sonic/Vacuum	Logged By: Penny Wilson
Outer Diameter of Boring: 2.5 inch	Drilling Subcontractor: ResonantSonic
Inner Diameter of Well Casing: 3/4-inch, 15 ft screen	Driller: Juan Morales
Depth to Water (ft./bgs.) 21.77 Ft (headspace 2 ppm)	Location Sketch: parking lot



Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count (per 6 inches) / V.B. utility type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
0900	0				NA	Asphalt; Basecrock (0-1 ft)	AS		
	1					CLAY ~~SILT~~ (ML), BLACK (2.5/1), slightly moist stiff, iron oxide-staining throughout low plasticity	ML		2-3 1
	2								
	3								3-4 2
9:15	4					SILT (ML), Light Gray (2.5Y 7/2), slightly moist, med stiff, low plasticity (most likely weathered bedrock - siltstone)	ML		4-5 1
	5								

TETRA TECH EM INC.

SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

CTO:

Bldg./Site: EILEMGB028

Project Name:

Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count (per 6 inches) / V.B. utility type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
	5						ML		
	6					mottled color change to olive yellow (2.5Y 6/8)			
	7								7-8
945	8								0
	9								9-10
									2
	10								
	11			ELEM 6P058		change to silt			11-12
									0
1110	12								
	13								

TETRA TECH EM INC.

SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

CTO:

Bldg./Site: ELEM GB028

Project Name:

Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count (per 6 inches) / V.B. utility type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
	13				NA	CLAYEY SILT (ML), Gray (5Y 6/1), slightly moist, med stiff, low plasticity, iron oxide staining throughout, (most likely weathered bedrock siltstone)	ML		13-14 ϕ
	14								
	15								15-16 ϕ
10:15	16								
	17					SILTY CLAY (ML), OLIVE YELLOW (2.5Y 6/8) slightly moist, med. stiff, low plasticity, (most likely weathered bedrock siltstone)			17-18 ϕ
	18								
	19								19-20 ϕ
10:24	20					CLAYE 1 SILT (ML), OLIVE YELLOW (2.5Y 6/8) slightly moist, very stiff, low plasticity, (most likely weathered bedrock siltstone)			
	21								

TETRA TECH EM INC.

SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

CTO:

Bldg./Site: ELEM GBOX 8

Project Name:

Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count (per 6 inches) / V.B. utility type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
	21				NA		ML		21-22
	22					Change color to strong brown N (7.5YR 5/6)			ϕ
10:30 Sample collected	23			GP059		Change color to olive yellow (2.5Y 6/2)			23-24 ϕ
10:25	24								—
	25					A few calcite deposits.			25-26 ϕ
	26								—
	27					SCREEN @ 27-32' feet (15 feet)			27-28 ϕ
10:40	28					CLAYEY SILT (ML), gray (5Y 6/1), slightly moist, very stiff, mottled, low plasticity, most likely weathered bedrock siltstone			—
	29								

TETRA TECH EM INC.

SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

CTO:

Bldg./Site: ELEMGB028

Project Name:

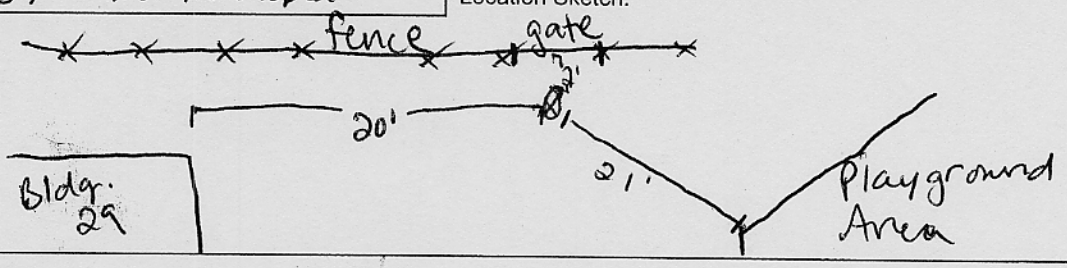
Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count (per 6 inches) / V.B. utility type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
	29				NA		ML		29-30
	30								
	31			GP060					31-32
						Change to Dk Gray (5Y 4/4/1), very stiff clayey silt. slightly moist, (lowlashing) most likely we altered bedrock silt stone			
10:50	32					32 feet bgs (bottom depth) screened 15' from bottom			

TETRA TECH EM INC.

SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

CTO:
Bldg./Site: Mare Island Elementary School
Project Name: ELEM GB029

Boring Number: ELEM GB029	Date Started: 8/19/03
Drilling Method: (*Circle one*) HSA Continuous Core/GeoProbe/Hand Auger	Date Completed: 8/19/03
Air Rotary/Mud Rotary/Dual Tube Percussion/Sonic/Vacuum	Logged By: Kenny Wilson
Outer Diameter of Boring: 2.5 inch	Drilling Subcontractor: Resonant Sonic
Inner Diameter of Well Casing: ~~[illegible]~~ 3/4 inch / 10ft screen	Driller: Juan Morales
Depth to Water (ft./bgs.) 18.59' no headspace	Location Sketch:



Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count (per 6 inches) / V.B. utility type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
	0					Asphalt - 6 inches Concrete/Baserock (6-18 inches	AC		
	1								
	2								2-3 Ø
	3					CLAY ~~SILT~~ (ML), BLACK (2.5/1), slightly moist, med stiff, low plasticity	ML		
11:20	4								
	5								

TETRA TECH EM INC.

SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

CTO: ELEMGB029

Bldg./Site:

Project Name:

Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count (per 6 inches) / V.B. utility type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
	5				NA	low plasticity			5-6 0
						SILT (ML), Light Gray (2.5Y 7/7/1), slightly moist, medium stiff, few calcite nodules, mottling throughout, most likely weathered bedrock silt stone	ML		
	6								
	7								7-8 0
11:25	8					↑ calcite nodules			
	9								9-10 0
	10								
	11			GW001 11:35					11-12 0
						low plasticity			
11:30	12					CLAYEY SILT (ML), Light Brown (2.5YR 6/3), slightly moist, med stiff, mottled, calcite deposits, most likely weathered bedrock silt stone	ML		

TETRA TECH EM INC.

SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

CTO: ELCA 6B029
Bldg./Site:
Project Name:

Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count (per 6 inches) / V.B. utility type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
	13				NA	Color change to light gray (2.5Y 7/2) iron oxide staining throughout			13-14 0
	14								
	15								
1140	16								
	17								17-18 Ø
	18								
	19			GP06 11:55					19-20 130
11:49	20								
	21								

TETRA TECH EM INC.

SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

CTO:
Bldg./Site: ELEM 6 B029
Project Name:

Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count (per 6 inches) / V.B. utility type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
	21				NA	Same			21-22 29
	22								
	23								23-24 7 ppm
11:55	24								
	25			6P063 12:10					25-26 193
	26								
	27					COLOR CHANGE TO DK BROWN (7.5YR 3/3/2)			27-28 0
12:00	28					COLOR CHANGE TO DK GREY (5Y 4/4/1)			
	29								

TETRA TECH EM INC.

SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

CTO:

Bldg./Site: ELEM 6B029

Project Name:

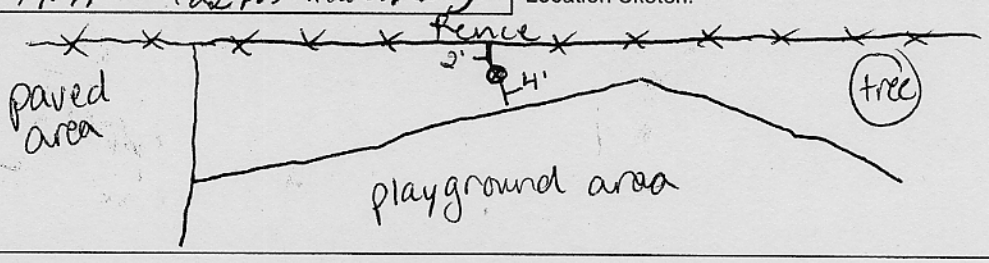
Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count (per 6 inches) / V.B. utility type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
	29				NA				29.30 ∅
	30								
	31			6P063 12:15					31-32 ∅
12:10	32					Bottom Depth Borehole 32 feet; 15 feet of screen from bottom			

TETRA TECH EM INC.

SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

CTO:
Bldg./Site: Mare Island Elema
Project Name: ELEM GB030

Boring Number: ELEMGB030	Date Started: 08/19/03
Drilling Method: (*Circle one*) HSA Continuous Core/GeoProbe/Hand Auger	Date Completed: 08/19/03
Air Rotary/Mud Rotary/Dual Tube Percussion/Sonic/Vacuum	Logged By: P. Wilson
Outer Diameter of Boring: 2 inch	Drilling Subcontractor: Resonant Sonic
Inner Diameter of Well Casing: N/A 3/4 inch diameter/20ft screen	Driller: Juan Morales
Depth to Water (ft./bgs.) 14.41 (22 ppb headspace)	Location Sketch:



Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count (per 6 inches) / V.B. utility type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
	0					Broken asphalt (3 11 inches)	AC		
						SAND (~~Poor~~ SP), poorly graded, strong brown (7.5YR 4/6) slightly moist, loose	SP		
	1								
	2								
	3					low plasticity ~~CLAY~~ ~~SILT~~ (ML), Black (2.5/1), slightly moist, med stiff, few calcite nodules, ~~slightly moist, loose~~,	ML		3-4 0
1:30	4								4-5 0
	5								

TETRA TECH EM INC.

SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

CTO:

Bldg./Site: ELEM6B030

Project Name:

Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count (per 6 inches) / V.B. utility type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
	5								
	6					SILT (ML), Light Gray (2.5Y 7/2/1), slightly moist, medium stiff, low plasticity, calcite nodules throughout. (most likely weathered bedrock siltstone			
	7								7-8 25
13:35	8					Change color to light brown (7.5YR 6/3)			
	9			GP064 13:45					9-10 32
	10								
	11								11-12 0
13:40	12					Clayey silt (ML), light brown (7.5YR 6/3), slightly moist, med stiff, mottled, calcite throughout (most likely weathered bedrock silt stone) low plasticity			
	13								

TETRA TECH EM INC.

SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

CTO:

Bldg./Site: CLEM 08030

Project Name:

Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count (per 6 inches) / V.B. utility type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
	13					color change to light gray (2.5Y 7/2) iron oxide staining throughout			13-4
									0
	14								
	15								
13:45	16								
	17								17-8
									30
	18					petroleum ODOR @ 18-19 ft			18-19
									230
	19			19-20 MS/MSD CP065 14:00					19-20
									328 MS/MSD 72
13:58	20					odor again @ 20 feet appears to be greenish stained in veins.			
	21								

TETRA TECH EM INC.

SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

CTO:

Bldg./Site: ECEM 60030

Project Name:

Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count (per 6 inches) / V.B. utility type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
	21								21-22
									19
	22								
	23								23-24
									4
14:10	24								24-25
									Ø
	25								
	26								26.5-27.5
									Ø
	29					color change to yellowish brown (10YR 5/3/6)			
						color change to light gray 2.5Y 7/2			
14:15	28								
	29								

TETRA TECH EM INC.

SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

CTO:

Bldg./Site: ELEMGB030

Project Name:

Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count (per 6 inches) / V.B. utility type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
	29					Color change to Dk gray (5Y 4/4/1)			29-30 0
	30					Moist @ 30 ft bgs change to slightly moist			
	31			31-32 14-30 GP066					31-32 0
14:25	32					~~Bottom depth 32 ft bgsl~~			
	33								33-34 ∅
	34					~~Clay~~ silt (ML), Light olive brown (2.5Y 5/4), slightly moist, soft to med stiff, low plasticity (most likely weathered bedrock siltstone)			
	35					Clayey silt (ML), Dk Gray (5Y 4/4/1), moist to wet medium stiff, low plasticity, (most likely weathered bedrock siltstone)			35-36 ∅
15:30	36					change to slightly moist, very stiff			
	37								

TETRA TECH EM INC.

SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

CTO:

Bldg./Site: ELEM 6B030

Project Name:

Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count (per 6 inches) / V.B. utility type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
	37				NA				37-38
									ϕ
	38								
	39								39-40
									ϕ
16:00	40					Bottom Depth of Borehole = 40 ftg Screen set 20 to 40 feet bgs			

Sheet 1 of 4

TETRA TECH EM INC.

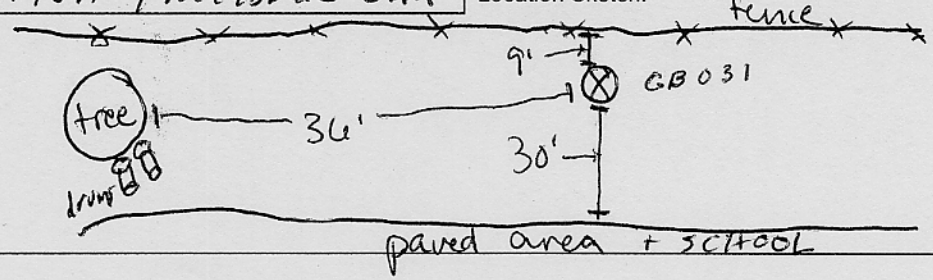
SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

CTO:

Bldg./Site: Mare Island Elementary School Site

Project Name:

Boring Number: ELEMGB031	Date Started: 8/19/03
Drilling Method: (*Circle one*) HSA/Continuous Core/~~Geoprobe~~/Hand Auger	Date Completed: 8/19/03
Air Rotary/Mud Rotary/Dual Tube Percussion/Sonic/Vacuum	Logged By: P. Wilson
Outer Diameter of Boring: 2.5"	Drilling Subcontractor: Resonant Sonic
Inner Diameter of Well Casing: N/A 3/4 inch diameter / 10 ft screen	Driller: Juan Morales
Depth to Water (ft./bgs.) 11.15 ft / headspace open	Location Sketch:



Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count (per 6 inches) / V.B. utility type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
	0					Ground surface (soil) Sand (SP), poorly graded, strong brown (7.5 YR 4/6), slightly moist, loose	SP		
	1								
	2					CLAY ~~Silt~~ (ML), BLACK (2.5 Y/1), slightly moist, med-stiff, low plasticity	ML		
	3								0
	4								
	5								

TETRA TECH EM INC.

SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

CTO:

Bldg./Site: ELEM GB031

Project Name:

Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count (per 6 inches) / V.B. utility type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
	5				NA				5-6
						SILT (ML), Brownish yellow (10YR 6/8) low plasticity slightly moist, med stiff, calcite nodules throughout (most likely weathered bedrock siltstone)	ML		0
	6								
	7								7-8
									0
1645	8								
	9			GP067					9-10
				1705					0
	10								
	11								11-12
									Ø
						Clayey Silt (ML), Light Brown (7.5YR 6/3) slightly moist, med stiff, no mottled, calcite within. low plasticity (most likely weathered bedrock siltstone)	ML		
1700	12								
	13								

TETRA TECH EM INC.

SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

CTO:

Bldg./Site: ELEM 6 B031

Project Name:

Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count (per 6 inches) / V.B. utility type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
	13								13-14
									Ø
	14								
	15								15-16
									Ø
1720	16			GP068 17:35		iron oxide staining throughout petroleum odor 16-18 feet.			44
	17								
	18								
	19								19-20 Ø/2
17:30	20					change to very stiff, mottling throughout			
	21								

TETRA TECH EM INC.

SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

CTO:
Bldg./Site: ELEM 6B031
Project Name:

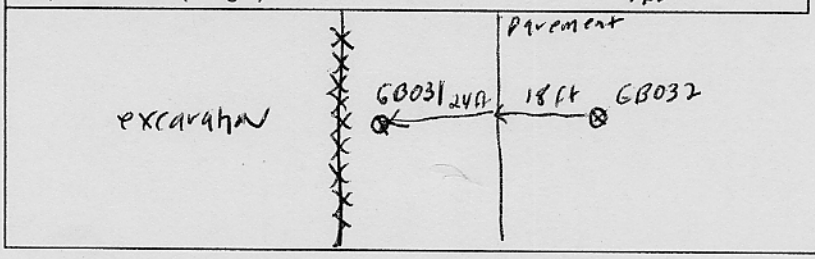
Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count (per 6 inches) / V.B. utility type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
	21						ML		21-22 1
	22								
	23								23-24 2
1800	24								
	25					~~Sandy silt (ML) Change to med stiff~~ SANDY SILT (ML). Light brown (7.5YR 6/3), slightly moist, med stiff, low plasticity (most likely weathered bedrock siltstone) Difficult drilling switch to 2-foot interval	ML		25-26 0
1815	26			GP069					
18.35	27			18.40		Refusal on bedrock @ 27 feet bgs			
	28								
	29								

TETRA TECH EM INC.

SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

CTO: ELEMGB032
Bldg./Site:
Project Name:

Boring Number: ELEMGBØ32	Date Started: 8/20/03
Drilling Method: (*Circle one*) HSA Continuous Core/GeoProbe/Hand Auger	Date Completed: 8/20/03
Air Rotary/Mud Rotary/Dual Tube Percussion/Sonic/Vacuum	Logged By: P. Wilson
Outer Diameter of Boring: 25 inch	Drilling Subcontractor: Resonant Sonic
Inner Diameter of Well Casing: ~~NA~~ 3/4" well screen/10ft	Driller: Juan
Depth to Water (ft./bgs.) NA ~~[illegible]~~	Location Sketch:



Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count (per 6 inches) / V.B. utility type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
8:00	0				NA	Asphalt (AC) - 6-inches	AC		
						CLAY (CL), Black (2.5Y/1), slightly moist, med. stiff, low plasticity	CL		
	1								
	2								
	3								3-4
									ϕ
8:15	4								
	5								

96-10, 13-14, 1-71

TETRA TECH EM INC.

SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

CTO: ELEMG B032

Bldg./Site:

Project Name:

Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count (per 6 inches) / V.B. utility type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
	5					CLAYEY SILT (ML), Light yellowish Brown (2.5Y 6/6/2), slightly moist, med. stiff, low plasticity few calcite nodules (most likely weathered siltstone)	ML		5-6 ∅
	6								
	7								7-8 ∅
						CLAYEY SILT (ML), STRONG BROWN (7.5YR 4/4/6), slightly moist, med stiff (most likely weathered low plasticity siltstone)			
8:20	8					SILT (ML), Light OLIVE BROWN (2.5Y 5/4), slightly moist, med stiff (most likely weathered bedrock siltstone low plasticity			
	9			6P10 8:30					9-10 ∅
	10					CLAYEY SILT (ML), Light Olive Brown (2.5Y 5/3/4) slightly moist, med stiff, low plasticity (most likely weathered bedrock siltstone)			
	11								11-12 ∅
8:30	12								
	13								

TETRA TECH EM INC.

SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

CTO:

Bldg./Site: ELEM GB032

Project Name:

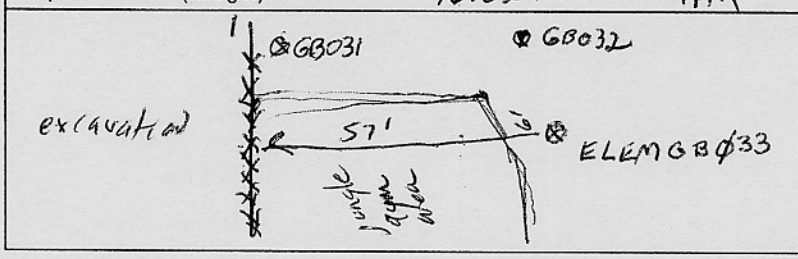
Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count (per 6 inches) / V.B. utility type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
	13			GP71 9:10		SANDY SILT (ML), ~~STRONG BROWN (7.5YR 4/4/6)~~ yellowish brown (10YR 5/4), slightly moist, med shft (most likely weathered bedrock siltstone)	ML		13-14 ∅
	14								
	15								15-16 ∅
8:45	16			GP72 9:15		COLOR CHANGE TO STRONG BROWN (7.5YR 4/4/6)			16-17 ∅
9:00	17					Refusal @ 17 feet bgs on siltstone sandy silt in shoe. ~~no rock observed~~. Drilled 0.5 feet additional ~~[illegible]~~ bedrock in shoe. well screen set @ 7-17 feet.			
	18					~~WATER~~ LEVEL ON 8/21/03 - 11.80 FT BGS			
	19					HEADSPACE - 0.4 PPM ELEM GP089 collected on 8/21/03			
	20								

TETRA TECH EM INC.

SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

CTO:
Bldg./Site: ELEMGB033
Project Name:

Boring Number: ELEMGBØ33	Date Started: 8/20/03
Drilling Method: (*Circle one*) HSA Continuous Core/GeoProbe/Hand Auger	Date Completed: 8/20/03
Air Rotary/Mud Rotary/Dual Tube Percussion/Sonic/Vacuum	Logged By: P. Wilson
Outer Diameter of Boring: 2.5 inch	Drilling Subcontractor: Resonant Sonic
Inner ~~Diameter of Well Casing~~: Well screen 3/4 inch, 15 ft screen	Driller: Juan Morales
Depth to Water (ft./bgs.) 16.02 ft 9ppm	Location Sketch:



Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count (per 6 inches) / V.B. utility type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
9:55	0					Asphalt (6 inches)	AC		
						Concrete/Baserock (6 inches)	BR		
	1					SAND (SP), yellow (10YR 7/7/8), slightly moist, loose, poorly sorted	SP		
	2								
	3					CLAY (CL), Black (2.5Y1/1), slightly moist, med stiff, low plasticity	CL		3-4
									Ø
10:00	4								
	5								

TETRA TECH EM INC.

SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

CTO:

Bldg./Site: ELEM6B033

Project Name:

Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count (per 6 inches) / V.B. utility type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
	5								
	6					low plasticity CLAYEY SILT (ML), Light yellowish brown (2.5Y 6/6/2) slightly moist, med stiff few calcite nodules (possibly weathered siltstone)	ML		
	7								7-8 0
10:10	8					SANDY SILT (ML), Brownish Yellow (10YR 6/6/6) slightly moist, med stiff, low plasticity (possibly weathered siltstone)	ML		
	9					low plasticity CLAYEY SILT (ML), Brownish Yellow (10YR 6/6/6) slightly moist, med stiff (possibly weathered siltstone)	ML		9-10 0
	10								
	11			GP73					11-12 0
10:20	12			10:25					
	13								

TETRA TECH EM INC.

SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

CTO:

Bldg./Site:

Project Name:

Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count (per 6 inches) / V.B. utility type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
	13								13-14 0
	14								
	15								15-16 0
10:30	16								
	17								17-18 0
	18								
	19			GP74		staining 19-20 feet bgs			19-20 143
10:40	20			10:45		change to sandy silt (same color)	ML		
	21								

TETRA TECH EM INC.

SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

CTO:

Bldg./Site:

Project Name:

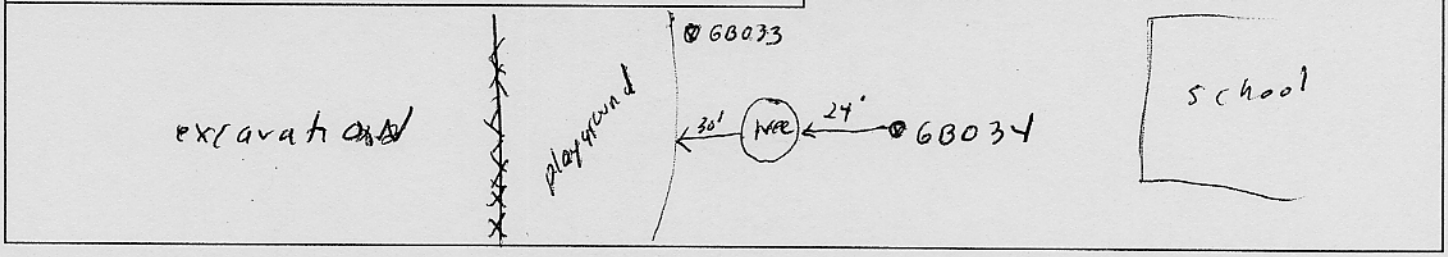
Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count (per 6 inches) / V.B. utility type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
	21						ML		21-22 0
	22								
	23								23-24 1 ppm
10:50	24								
	25					Change to very stiff			25-26 0
10:58	26					Change to moist; med stiff			
	27			GP15 11:20					27-28 0
11:15	28					SILT (ML), Black (5Y, 2.5/2.5/1), slightly moist very stiff, low plasticity most likely weathered bedrock			
	29					Refusal @ 28.5 feet. Screen set 13 to 28.0 feet			

TETRA TECH EM INC.

SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

CTO:
Bldg./Site: ELEMGB034
Project Name:

Boring Number: ELEMGB034	Date Started: 8/20/03
Drilling Method: (*Circle one*) HSA Continuous Core/GeoProbe/Hand Auger	Date Completed: 8/20/03
Air Rotary/Mud Rotary/Dual Tube Percussion/Sonic/Vacuum	Logged By: P. Wilson
Outer Diameter of Boring: 25 inch	Drilling Subcontractor: Resonant Sonic
Inner Diameter of Well Casing: NA 3/4 inch diameter / 10 ft screen	Driller: Juan Morales
Depth to Water (ft./bgs.) NA	Location Sketch:



Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count (per 6 inches) / V.B. utility type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
12:00	0					Asphalt (6 inches)	AC		
						CLAY (CL), BLACK (2.5Y 1/1) slightly moist, med. stiff, low plasticity	CL		
	1								
	2								
	3								3-4
12:05	4								ϕ
	5								

TETRA TECH EM INC.

SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

CTO:
Bldg./Site: ELEM GB034
Project Name:

Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count (per 6 inches) / V.B. utility type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
	5					Color change to olive (5Y 4/4/3)	CL		5-6
									Ø
	6					low plasticity SANDY SILT (ML), yellowish brown (10YR 5/5/8) slightly moist, med. stiff, calcite veins and nodules embedded in material (most likely weathered siltstone)	ML		
	7								7-8
									Ø
12:10	8								~~29~~
	9			GP077 12:35					9-10
									Ø
	10								
	11								11-12
									Ø
12:15	12								
	13								

TETRA TECH EM INC.

SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

CTO:

Bldg./Site: ELEM GB034

Project Name:

Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count (per 6 inches) / V.B. utility type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
	13			GP78 12:35		CLAYEY SILT (ML), yellowish brown (10YR 5/5/6) slightly moist, very stiff, most likely weathered bedrock (siltstone) low plasticity	ML		13-14 ∅
	14								
	15								15-16 ∅
12:20	16			GP79 12:40					
12:30	17					~~Clayey silt (ML) yellowish brown (10YR 5/5/6) slightly moist very stiff (most likely weathered silt stone)~~ Refusal encountered at 17 feet bgs (most likely on bedrock). screen set 10 to 17 feet bgs WATER LEVEL ON 8/21/03 - 12.11 FT BGS HEADSPACE - 5 PPM ELEM GP090 COLLECTED ON 8/21/03			
	18								
	19								
12:30	20								

Sheet 1 of 3

CTO: MARE ISLAND ELEM SCHO

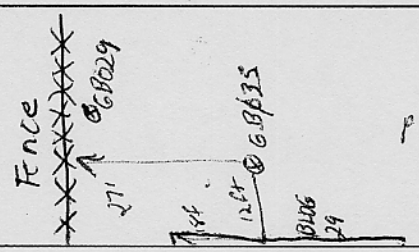
Bldg./Site: ELEM GB03S

Project Name:

TETRA TECH EM INC.

SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

Boring Number: ELEMGB03S	Date Started: 8/20/03
Drilling Method: (*Circle one*) HSA Continuous Core/GeoProbe/Hand Auger	Date Completed: 8/20/03
Air Rotary/Mud Rotary/Dual Tube Percussion/Sonic/Vacuum	Logged By: P. Wilson
Outer Diameter of Boring: 2-inch	Drilling Subcontractor: Resonant Sonic
Inner Diameter of Well Casing: 3/4 inch: 10 feet screen	Driller: Juan Morales
Depth to Water (ft./bgs.)	Location Sketch:



Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count (per 6 inches) / V.B. utility type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
1315	0				NA	Asphalt (AC), 6-inches	AC		
						Baserock Concrete			
	1								
	2								
	3					CLAY (CL) BLACK (2.5 Y 1/1), slightly moist med. stiff, low plasticity	CL		
1320	4								
	5								

TETRA TECH EM INC.

SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

CTO:

Bldg./Site:

Project Name:

Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count (per 6 inches) / V.B. utility type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
	5				NA				
						SILT (ML), Light brownish gray (10YR 6/6/2), slightly moist, med stiff, low plasticity (most likely weathered bedrock - siltstone)	ML		
	6								6-7
									0
	7								7-8
									0
1330	8					SILT (ML), Brownish yellow (10YR 6/6/6) slightly moist, med stiff, low plasticity (most likely weathered bedrock siltstone)	ML		
	9								9-10
									0
	10					change to very stiff			
	11								11-12
									0
1335	12					change to med stiff			
	13								

TETRA TECH EM INC.

SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

CTO:

Bldg./Site: ELEM GB03 S

Project Name:

Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count (per 6 inches) / V.B. utility type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
	13				NA		ML		13-14 0
	14								
	15								15-16 0
1340	16					change to shft			
	17		GP79 14:10	GP79 14:10					17-18 14:10 13 GP79
	18								
	19		GP80 14:20	GP80 1420					19-20 14:20 11 GP80
1345	20		GP81 14:30	GP81 14:30					20-21 14:30 2 GP81

1400

Bottom Depth 21.5 feet bgs
10 feet screen 11 to 21. feet bgs
WATER LEVEL ON 8/21/03 — 16.65 ft BGS
HEADSPACE — 0 ppm

APPENDIX F
RESPONSES TO REGULATORY AGENCY COMMENTS ON THE DRAFT SITE INSPECTION REPORT

RESPONSES TO REGULATORY AGENCY COMMENTS ON THE DRAFT SITE INSPECTION FOR THE MARE ISLAND ELEMENTARY SCHOOL FORMER MARE ISLAND NAVAL SHIPYARD, VALLEJO, CALIFORNIA

This document presents the U.S. Department of the Navy's (Navy) responses to comments from the regulatory agencies on the "Draft Site Inspection for the Mare Island Elementary School, Former Mare Island Naval Shipyard, Vallejo, California," dated February 21, 2003. Comments were received from the California Regional Water Quality Control Board (RWQCB) on May 1, 2003, and from the U.S. Environmental Protection Agency (EPA) on May 12, 2003. No comments were received from the California Department of Toxic Substances Control.

RESPONSES TO COMMENTS FROM THE RWQCB

1. **Comment:** **Section 3.2.2, Page 6: The text states that "[g]roundwater at the site is assumed to be brackish because of the site's proximity to the San Francisco Bay." The conclusion is that "…the Navy considers the groundwater [at the site] to be unacceptable for beneficial uses such as a drinking water source." The Water Quality Control Plan for the San Francisco Bay Basin (RWQCB, 1995) designates all groundwaters in the region as being suitable, or potentially suitable, for municipal and domestic water supply. Limited exceptions are provided in cases of elevated levels of total dissolved solids or low yield, in accordance with SWRCB Resolution No. 88-63. No data regarding these exception criteria are provided in the Site Inspection report; therefore, it is inappropriate to conclude that groundwater is unsuitable for use as a drinking water source.**

   Response: The text has been revised to reflect the conclusions of the "Draft Technical Memorandum, Examination of Groundwater at Mare Island Naval Shipyard for Municipal and Domestic Water Supply" (PRC Environmental Management, Inc. 1995). The referenced document states that due to low conductivity, this area would be unable to support a sustained yield of 150 gallons per day, as designated by the RWQCB for sources of drinking water.

2. **Comment:** **Section 3.4.2, Page 8: The text states there are no complete human exposure pathways for groundwater at the school site. In the absence of specific data that allow the RWQCB to conclude that the exception criteria in SWRCB Resolution No. 88-63 are met, site groundwater is potentially suitable for use as a source of drinking water. Therefore, there is the potential for the groundwater ingestion pathway at the site and risks should be evaluated accordingly. This comment also applies to sections 5.2, 6.2.1, and 6.2.2.**

   Response: As noted in the response to RWQCB comment 1, the area is unable to be a source for drinking water because of low productivity.

3. **Comment:** **A relatively extensive area of petroleum-impacted soil was identified in the former Farragut Village (Investigation Area D2) to the west of the Mare Island Elementary School property in January, 2003. RWQCB staff are currently reviewing a work plan to delineate the eastern extent of this contamination. If soil or groundwater contamination is found to extend onto the school site, additional investigation or remedial action may be required.**

Response: Additional sampling was performed at the school site in August 2003 to determine if contamination from the adjacent site is present at the school site. Results of the sampling indicated that, while TPH exceeded the comparison criterion in one soil boring location, elevated concentrations in the other nearby locations were not detected during the August 2003 sampling event. The exposure pathway for human ingestion of groundwater is not complete, and concentrations of TPH do not pose unacceptable risk to human health. Section 5.2 of the draft final site inspection report discusses results of the August 2003 sampling event.

RESPONSES TO COMMENTS FROM EPA

1. **Comment:** **EPA has reviewed the Navy's Draft Site Inspection for the Mare Island Elementary School. EPA has no comments on the Site Inspection report that was prepared. However, petroleum contamination has been discovered on the property adjacent to the school site at the intersection between 9th Street and Tisdale Ave. EPA believes that the former AST 636 at the school yard and 772 at adjacent site IR23 are most likely suspect sources for the contamination present on the adjacent property. The extent of contamination needs to be bounded, and the school property between the tanks and the adjacent property also needs to be investigated for presence of petroleum contamination due to a possible discharge from these tanks.**

Response: Additional sampling at the school site was performed in August 2003 to determine if contamination from the adjacent site is present at the school site. Results of the sampling indicated that, while TPH exceeded the comparison criterion in one boring location, elevated concentrations in the other nearby locations were not detected during the August 2003 sampling event. The exposure pathway for human ingestion of groundwater is not complete, and concentrations of TPH do not pose unacceptable risk to human health. Section 5.2 of the draft final site inspection report discusses results of the August 2003 sampling event.

REFERENCES

PRC Environmental Management, Inc. 1995. "Draft Technical Memorandum, Examination of Groundwater at Mare Island Naval Shipyard for Municipal and Domestic Water Supply." April 20.