

**FINAL EXPLANATION OF SIGNIFICANT DIFFERENCES
SITE 18 – REGIONAL VOLATILE ORGANIC COMPOUND
GROUNDWATER PLUME
(OPERABLE UNIT 1)
SITE 24 – VOC SOURCE AREA (OPERABLE UNIT 2A)
VADOSE ZONE RESAMPLING
FORMER MCAS EL TORO, CALIFORNIA**

December 2008

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ACRONYMS AND ABBREVIATIONS

1,1-DCE	1,1- dichloroethene
µg/L	micrograms per liter
ARAR	applicable or relevant and appropriate requirement
BRAC	Base Realignment and Closure
CFR	Code of Federal Regulations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DON	Department of the Navy
DTSC	California Department of Toxic Substances Control
ESD	Explanation of Significant Differences
FFA	Federal Facilities Agreement
Freon 113	1,1,2-trichloro-1,2,2-trifluoroethane
FS	feasibility study
IRP	Installation Restoration Program
IRWD	Irvine Ranch Water District
MCAS	Marine Corps Air Station
MCL	maximum contaminant level
NFA	no further action
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
OCWD	Orange County Water District
OU	Operable Unit
PA	principal aquifer
PCE	tetrachloroethene
RAO	remedial action objective
RI	remedial investigation
ROD	record of decision
RWQCB	California Regional Water Quality Control Board
SARA	Superfund Amendments and Reauthorization Act
SEOR	System Evaluation and Optimization Report
SGU	shallow groundwater unit
SVE	soil vapor extraction
TBD	to be determined
TCE	trichloroethene
U.S. EPA	United States Environmental Protection Agency
VOC	volatile organic compound

1.0 Introduction

Site Name and Location

Site 18, Regional Volatile Organic Compound (VOC) Groundwater Plume – Operable Unit 1 (OU 1)
Site 24, VOC Source Area – Operable Unit 2A (OU 2A)
Former Marine Corps Air Station (MCAS) El Toro
Irvine, California 92709
National Superfund Database Identification Number: CA6170023208

Statement of Purpose

This document is an Explanation of Significant Differences (ESD) to the Final Record of Decision (ROD) (DON 2002) for Installation Restoration Program (IRP) Site 18 - Regional VOC Groundwater Plume (OU 1), and Site 24 – VOC Source Area (OU 2A), at former MCAS El Toro, California. IRP Site 24 comprises two media: soil and groundwater, with remedies documented in two separate RODs.

The Final ROD for the groundwater remedy at Sites 18 and 24 (“Final Groundwater ROD”) was signed by the Department of Navy (DON) on 18 June 2002 pursuant to: DON’s authority as the lead federal agency for Comprehensive Environmental Response Compensation and Liability Act (CERCLA) remedy selection at former MCAS El Toro; pursuant to Sections 104 and 120 of CERCLA; Executive Order 12580; and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 Code of Federal Regulations [CFR] part 300). The Final Groundwater ROD was signed by the United State Environmental Protection Agency (U.S. EPA) on 25 June 2002, Department of Toxic Substances Control (DTSC) on 20 June 2002, and Regional Water Quality Control Board (RWQCB) on 24 June 2002.

An ESD was completed in January 2006 to describe and justify modifications to actions required at Sites 18 and 24 as specified in the Final Groundwater ROD. The January 2006 ESD addressed changes to the CERCLA Component of the Modified Irvine Desalter Project, specifically the relocation of the VOC Treatment Plants for the Shallow Groundwater Unit (SGU) and Principal Aquifer (PA), the reconfiguration of groundwater extraction well locations and extraction rates in the PA, inclusion of the alternative for disposal of treated SGU groundwater to the non-CERCLA brine line, and related changes.

In September 1997, the Federal Facility Agreement (FFA) signatories approved the OU2A Interim ROD (“Interim Soil ROD”) for the Site 24 vadose zone (DON 1997). The Interim Soil ROD documented soil vapor extraction (SVE) as the selected remedy to address VOCs in soil, and contained a provision for resampling of the vadose zone at the conclusion of groundwater remediation. The soil remedy was implemented from 1999 to 2001 in accordance with the Interim Soil ROD. Following remedy implementation, the Closure Report (Earth Tech 2002) concluded that VOC concentrations in soil gas had been reduced below the groundwater protective threshold limits established in the Interim Soil ROD. The Final OU2A ROD (“Final Soil ROD”) documented no further action (NFA) for the IRP Site 24 vadose zone based on the protection of human health and the environment, and specified that an ESD to the Sites 18 and 24 Groundwater ROD will be prepared to explain differences between the Interim and Final RODs for soils at Site 24 that are associated with groundwater. The Final Soil ROD was approved by the FFA signatories in April 2006 (DON 2006).

The second paragraph of Section 9 of the Final Soil ROD for Site 24 states on p. 9-1:

"An ESD to the Sites 18 and 24 groundwater ROD will be prepared to explain differences between the Interim and Final RODs for soils at Site 24 that are associated with groundwater. The primary focus of the ESD will be resampling of the vadose zone at the conclusion of groundwater remediation to assure that soil has not been recontaminated from VOCs in groundwater. This resampling was presented as one of the components of the selected remedy in the Interim ROD for the Site 24 VOC Source Area (Vadose Zone); however, it will be incorporated into the selected remedy for groundwater at Sites 18 and 24."

In accordance with the Final Soil ROD, the primary focus of this ESD is the resampling of the vadose zone at the end of groundwater remediation to assure that soil has not been recontaminated from VOCs in groundwater.

The preparation and public notice of this ESD is pursuant to: Section 117(c) of the CERCLA of 1980, as amended by the Superfund Amendment and Reauthorization Act of 1986 (SARA); and pursuant to 40 CFR Section 300.435(c)(2)(i).

This ESD includes a brief summary of the remedy selected in the Interim Soil ROD for Site 24, the Final Groundwater ROD for Site 18 and Site 24, and the Final Soil ROD for Site 24. This ESD also includes a description of the proposed changes to the Final Groundwater ROD and a description of why the DON is making these changes to the selected remedy. This ESD was prepared according to the United States Environmental Protection Agency (U.S. EPA) guidance document, *A Guide to Preparing Superfund Proposed Plans, Records of Decision and Other Remedy Selection Decision Documents* (U.S. EPA 1999).

The lead regulatory agency for this ESD is the U.S. EPA. In addition to the U.S. EPA, the California RWQCB and the California DTSC oversee the site cleanup at former MCAS El Toro and have commented on this ESD. Responses to these comments are presented in Attachment A.

2.0 Summary of Site History, Contamination, and Selected Remedy

Former MCAS El Toro is located in a semi-urban/agricultural area of southern California, approximately 8 miles south of Santa Ana and 12 miles northeast of Laguna Beach (Figure 2-1). Former MCAS El Toro covers approximately 4,740 acres. Land use surrounding the former Station includes commercial, light industrial, agricultural, and residential. Former MCAS El Toro was operationally closed on 2 July, 1999, in accordance with the Base Realignment and Closure (BRAC) Act.

A Phase I Remedial Investigation (RI), a Phase II RI/Feasibility Study (FS), and various site-specific investigations and studies identified VOC contamination, mainly trichloroethene (TCE) and tetrachloroethene (PCE) in soil and groundwater, at the former Station. VOC contamination migrated from the soil to the shallow groundwater unit (SGU) at Site 24 and to the regional principal aquifer (PA) at Site 18, which is defined as the area where TCE concentrations are greater than 5 micrograms per liter ($\mu\text{g/L}$) in the PA (Figure 2-2). Site 24 encompasses the VOC source area in the southwest quadrant of former MCAS El Toro (Figure 2-2).

Site 24, comprises soil and groundwater at the VOC source area. The soil component of Site 24 was addressed in the Interim Soil ROD (DON 1997) that documented selection of SVE, the U.S. EPA presumptive remedy for VOC-contaminated soil, as the remedy. The Site 24 ROD was interim because it did not address groundwater at the site and because the Navy agreed to reevaluate cleanup concentrations for soil in the Final Soil ROD. The cleanup concentrations for soil were further evaluated in the System Evaluation and Optimization Report (SEOR) (Earth Tech 1999) and the

concentrations were determined to be protective of groundwater quality. Additionally, a site closure strategy developed as part of the SEOR was approved by the FFA signatories.

The remedy for soil was implemented in accordance with the Interim Soil ROD and documented in the Closure Report (Earth Tech 2002) submitted to the regulatory agencies. The regulatory agencies concurred with the Closure Report, which concluded that the remedial action objectives (RAOs) for soil have been fulfilled (see Section 2.1.1). A Final Soil ROD documenting NFA for Site 24 soils was approved by the FFA signatories and finalized in April 2006 (DON 2006).

2.1 Selected Remedy

2.1.1 Interim Soil ROD

The major components of the selected remedy for the vadose zone at Site 24 presented in the Interim ROD (DON 1997) include:

- Construction, operation and maintenance of an SVE system to remove TCE and other VOCs from the soil;
- Performance monitoring throughout the predicted 2 to 4 years of remediation;
- Treatment of VOC-contaminated soil gas (vapors) with activated carbon filters to meet air quality standards prior to discharge to the atmosphere;
- Confirmatory soil gas sampling at the end of the vadose zone remediation to confirm that average VOC concentrations are too low to contaminate groundwater above the maximum contaminant levels (MCL); and
- The vadose zone will be resampled at the conclusion of groundwater remediation. If the average soil gas concentrations are found to be above the threshold limits, additional vadose zone remediation may be necessary.

The RAOs established in the Interim Soil ROD are as follows:

- Reduce concentrations of VOCs in the VOC source areas to prevent or minimize further degradation of the SGU above the MCL for drinking water; and
- Continue vadose zone remediation until the average VOC soil gas concentrations are below threshold concentrations (concentrations capable of contaminating groundwater above the MCLs).

The selected remedy was implemented in accordance with the Interim Soil ROD (DON 1997) and documented in the Closure Report (Earth Tech 2002). The Closure Report confirmed that RAOs specified in the Interim Soil ROD had been attained.

2.1.2 Final Soil ROD

The Final Site 24 Soil ROD (DON 2006) documented that soil at Site 24 does not pose an unacceptable risk to human health and the environment, and no further remedial action is necessary for vadose zone soils at Site 24. The Final Soil ROD also documented that the soil gas cleanup goals initially presented in the Interim Soil ROD and reevaluated in the SEOR were indeed protective of groundwater quality and human health. The final cleanup goals established in the Final Soil ROD are listed below.

Table 2-1: Soil Gas Cleanup Levels

VOC	Soil Gas Threshold Concentration ^a (µg/L)
TCE	27
PCE	69

VOC	Soil Gas Threshold Concentration ^a (µg/L)
Carbon tetrachloride	61
1,1-DCE	563
Freon 113	234,000

^a Soil gas threshold concentration established in the Final Soil ROD (DON 2006).

µg/L micrograms per liter

Freon 113-1,1,2-trichloro-1,2,2-trifluoroethane

PCE - tetrachloroethene

1,1-DCE – 1,1-dichloroethene

TCE - trichloroethene

VOC - volatile organic compound

2.1.3 Groundwater ROD

The selected CERCLA remedy for both Site 18 and Site 24, as described in the Final Groundwater ROD (DON 2002), includes the following:

- Construction, operation, and maintenance of a groundwater extraction system to remove VOCs from groundwater;
- Performance monitoring during the remedial action;
- Treatment of VOC-contaminated groundwater using air stripping and treatment of VOC vapors with granular activated carbon filters to meet air quality standards before discharge to the atmosphere;
- Confirmatory groundwater sampling at the end of the remediation to confirm that VOC concentrations meet Federal and State cleanup levels; and
- Institutional controls to prevent use of contaminated groundwater, protect equipment, and allow access to the DON, Orange County Water District (OCWD)/Irvine Ranch Water District (IRWD), and regulatory agency personnel.

The RAOs established in the Final Groundwater ROD are as follows:

Site 18 Groundwater

- Reduce concentrations of VOCs in the area of concern in the SGU and in the PA downgradient of the source areas to Federal and State cleanup levels;
- Contain migration of VOCs above cleanup levels in the PA; and
- Prevent domestic use of groundwater containing VOCs at concentrations above cleanup levels.

Site 24 Groundwater

- Reduce concentrations of VOCs in the Site 24 SGU to Federal and State cleanup levels;
- Prevent use of groundwater containing VOCs at concentrations above cleanup levels; and
- Prevent VOCs at concentrations above cleanup levels from migrating beyond the SGU.

3.0 Basis for the Document

This section presents information that supports a change to the remedial action required in the Final Groundwater ROD for Sites 18 and 24. The Final Soil ROD specified that an ESD to the Sites 18 and 24 Groundwater ROD will be prepared to explain differences between the Interim and Final RODs for soils at Site 24 that are associated with groundwater. In accordance with the Final Soil

ROD, the primary focus of this ESD is the resampling of the vadose zone at the end of groundwater remediation to assure that soil has not been recontaminated from VOCs in groundwater. This resampling was presented as one of the components of the selected remedy in the Interim Soil ROD for the Site 24 VOC Source Area (Vadose Zone); however, it will now be incorporated into the selected remedy for Site 18 and Site 24 groundwater pursuant to this ESD.

Implementation of the soil remedy pursuant to the Interim Soil ROD reduced soil gas concentrations in Site 24 vadose zone soils below threshold levels determined to be protective of groundwater quality. Residual VOCs detected in soil gas below threshold levels during remedy closure verification sampling were determined to be the result of volatilization from contaminated groundwater (Earth Tech 2002). Therefore, since the source of residual VOCs detected in soil gas is the groundwater and not the soil, the provision for vadose zone resampling is more appropriately incorporated as a component of the selected remedy for groundwater. Therefore, this ESD documents that resampling the vadose zone at the completion of the groundwater remedy will be included as a component of the selected remedy for groundwater at Site 18 and Site 24.

4.0 Description of Significant Differences

The remedial action selected in the Final Groundwater ROD for Site 18 and Site 24 is hereby revised as required in Section 9 of the Final Soil ROD by providing for vadose zone sampling at the end of the groundwater remedy. An ESD is the appropriate means to document these changes, because they involve changes to the remedy that do not fundamentally alter the scope, performance, or cost of the CERCLA remedy. The target cleanup goals in this ESD, as well as the method of treatment, remain the same as those originally documented in the Final Groundwater ROD. The overall scope with respect to cost, performance, and duration of this remedial action will remain the same. The remedy will continue to comply with the RAOs and applicable or relevant and appropriate requirements (ARARs) identified and documented in the Final Groundwater ROD. The changes achieve a consistent level of protection to human health and the environment as the selected remedy documented in the Final Groundwater ROD.

The Final Soil ROD stated that an ESD to the Groundwater ROD will be prepared to address vapor sampling at the conclusion of groundwater remediation at the source area. The vadose zone source area is located in the immediate vicinity of Hangars 296 and 297 (DON 2006). Based on this conclusion, vapor sampling will be conducted in the vicinity of Hangars 296 and 297 (Figure 2-2) at the completion of the Site 18 and Site 24 groundwater remedy. Results from this sampling will then be used as the basis for documenting whether average VOC concentrations remain below the threshold limits specified in the Final Soil ROD that would result in groundwater concentrations above the MCL.

5.0 Support Agency Comments

Documentation of regulatory comment on the Draft ESD is provided in Attachment A.

6.0 Statutory Determinations

The remedy as changed pursuant to this ESD complies with CERCLA and the NCP, remains protective of human health and the environment, and complies with ARARs identified in the ROD.

7.0 Public Participation

This ESD will become part of the administrative record for the site (NCP, 40 CFR Section 300.825 (a)(2)). A notice of public availability and a brief description of the ESD will be published in a major local newspaper. The ESD will be available for public review at the following locations:

- Heritage Park Regional Library
MCAS El Toro Information Repository
14361 Yale Avenue
Irvine, CA 92604
(949) 551-7151
Hours: Monday – Thursday: 10:00 A.M. to 9:00 P.M.
Friday and Saturday: 10:00 A.M. to 5:00 P.M.
Sunday: Noon to 5:00 P.M.

- MCAS El Toro Administrative Record File
BRAC Office, Building 307
Former MCAS El Toro
Contact Ms. Marge Flesch
(949) 726-5398



Anthony M. Megliola
Base Closure Manager
Former Marine Corps Air Station El Toro

Date: 9-26-08



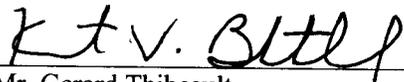
Mr. Michael M. Montgomery, Chief
Federal Facility and Site Cleanup Branch
United States Environmental Protection Agency, Region 9

Date: 12-15-08



Mr. John E. Scandura, Chief
Southern California Operations
Office of Military Facilities
Department of Toxic Substances Control

Date: 10/3/08



for

Mr. Gerard Thibeault
Executive Officer
Regional Water Quality Control Board Santa Ana Region

Date: 10/7/08

8.0 References

Earth Tech, Inc. 1999. *Draft System Evaluation and Optimization Report, IRP Site 24 Vadose Zone Remediation, Marine Corps Air Station, El Toro, California.* May.

_____. 2002. *Draft Final Site Closure Report, Vadose Zone Remediation, IRP Site 24, Volatile Organic Compounds Source Area, Former Marine Corps Air Station, El Toro, California.* June.

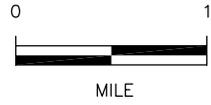
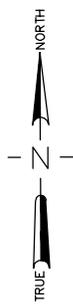
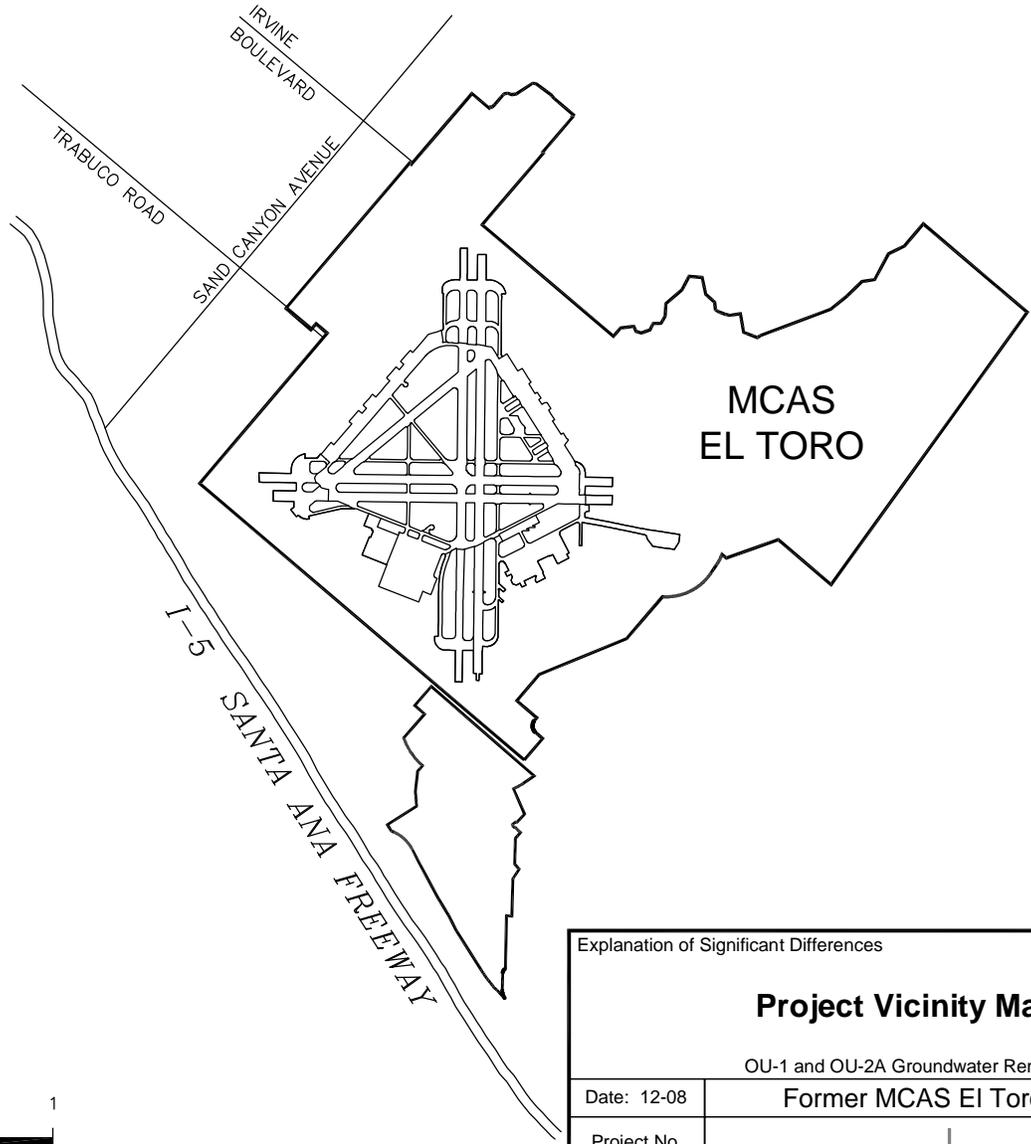
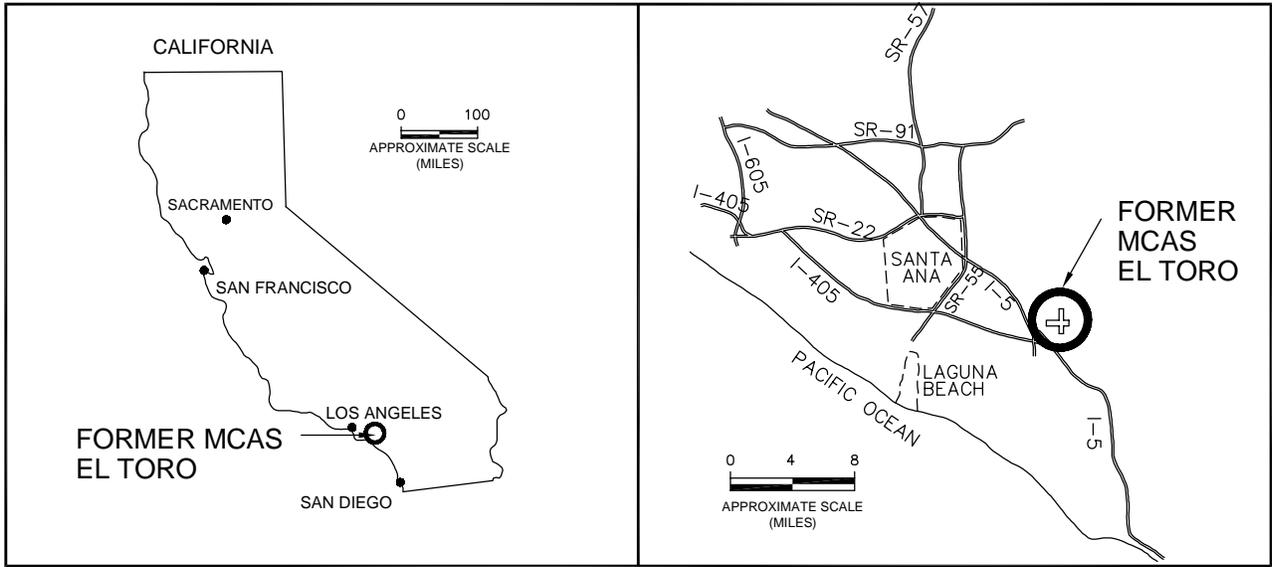
U.S. Department of the Navy (DON). 1997. *Draft Final Interim Record of Decision, Operable Unit 2A – Site 24, VOC Source Area Vadose Zone, Marine Corps Air Station El Toro, California.* Southwest Division Naval Facilities Engineering Command, San Diego, California. September.

_____. 2002. *Final Record of Decision, Operable Unit 1, Site 18 – Regional Volatile Organic Compound Groundwater Plume, Operable Unit 2A, Site 24 – VOC Source Area, Former Marine Corps Air Station El Toro, California.* Southwest Division Naval Facilities Engineering Command, San Diego, California. June.

_____. 2006. *Final Record of Decision, Operable Unit 2A, Site 24 – VOC Source Area Vadose Zone, Former Marine Corps Air Station El Toro, California.* Southwest Division Naval Facilities Engineering Command, San Diego, California. April.

U.S. Environmental Protection Agency (U.S. EPA). 1999. *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents.* EPA 540-R-98-031. July.

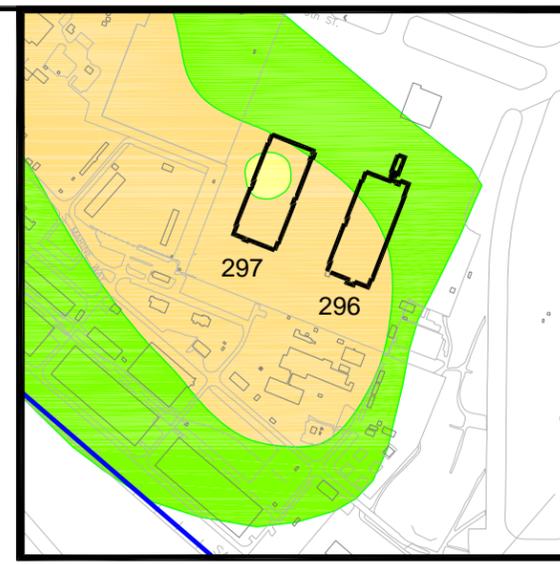
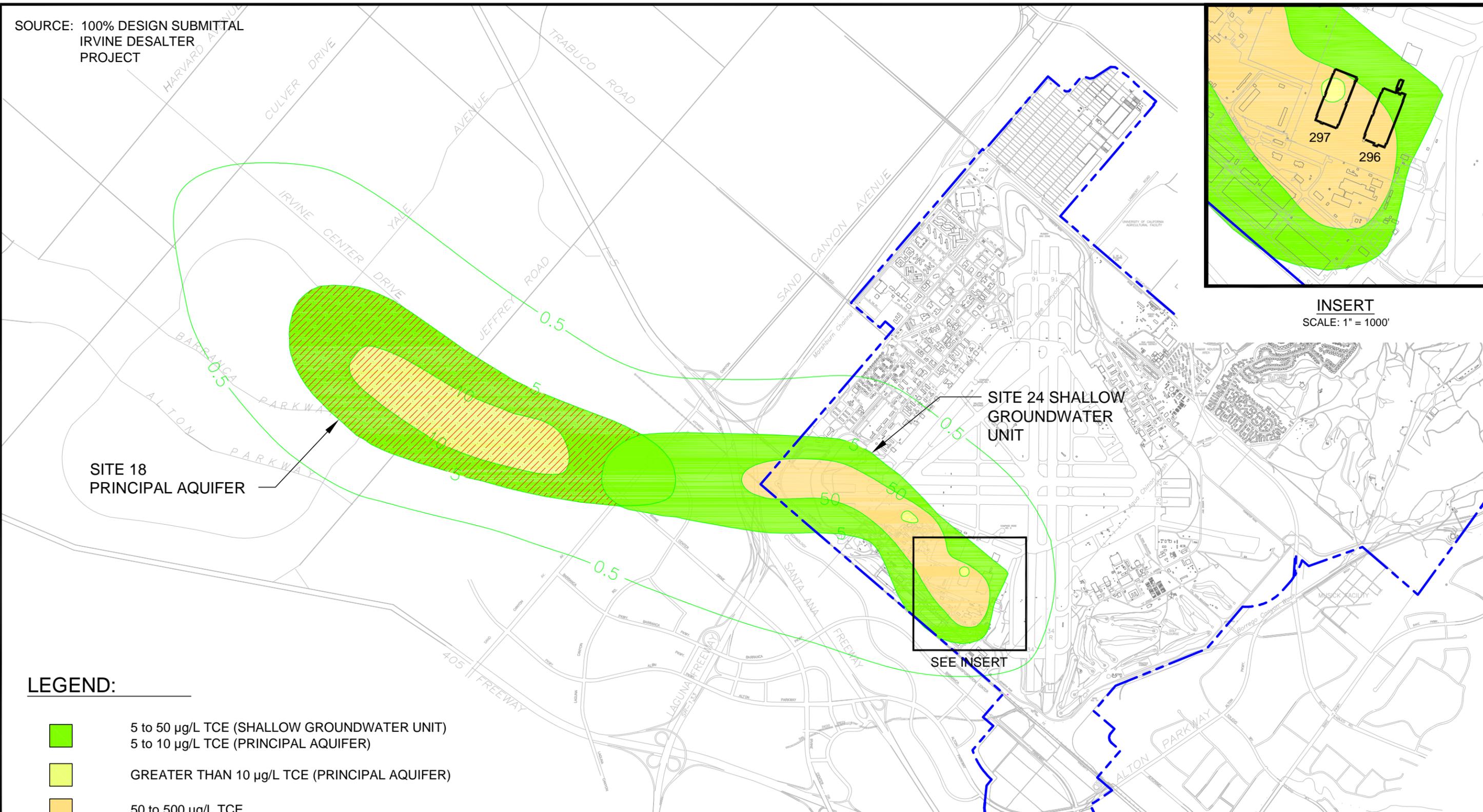
Figures



Explanation of Significant Differences		Final
Project Vicinity Map		
OU-1 and OU-2A Groundwater Remedy		
Date: 12-08	Former MCAS El Toro	
Project No. 29307	EARTH TECH AECOM	Figure 2-1

SOURCE: 100% DESIGN SUBMITTAL
IRVINE DESALTER
PROJECT

File: L:\work\29307\cad\OU1 and OU2A Remedy\Final\FIGURE 2-2.dwg Time: Dec 19, 2008 - 2:57pm

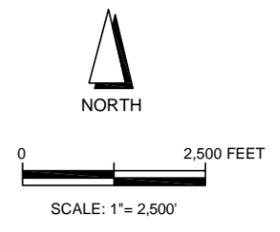


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LEGEND:

- 5 to 50 µg/L TCE (SHALLOW GROUNDWATER UNIT)
5 to 10 µg/L TCE (PRINCIPAL AQUIFER)
- GREATER THAN 10 µg/L TCE (PRINCIPAL AQUIFER)
- 50 to 500 µg/L TCE
- GREATER THAN 500 µg/L TCE
- 5 INFERRED CONCENTRATION CONTOUR (µg/L) GROUNDWATER BOUNDARIES
- FORMER MCAS EL TORO PROPERTY LINE



Explanation of Significant Differences		Final
VOC Groundwater Plume		
OU-1 and OU-2A Groundwater Remedy		
Date: 12-08	Former MCAS El Toro	
Project No. 29307	EARTH TECH AECOM	Figure 2-2

Attachment A
Regulatory Comments

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

28 July 2008

Marine Corps Air Station El Toro
Base Realignment and Closure
Attn: Ms. Debra Theroux
Deputy Base Closure Manager
7040 Trabuco Road
Irvine, California 92618

Subject: Draft Explanation of Significant Differences (ESD), Site 18 Regional Volatile Organic Compound (VOC) Groundwater Plume (Operable Unit 1) & Site 24 VOC Source Area (Operable Unit 2A), Former MCAS El Toro, California

Ms. Theroux:

The U.S. Environmental Protection Agency has reviewed the subject ESD dated May 2008. EPA has no comments on the document as presented.

If you should have any questions/concerns, please contact me at 415-972-3349.

Sincerely,



Rich Muza
Remedial Project Manager
Federal Facility and Site Cleanup Branch

cc. Marc Smits, NFECSW SDIEGO
Content Arnold, NFECSW SDIEGO
Quang Than, DTSC
John Broderick, RWQCB
Bob Woodings, RAB Co-Chair
Marcia Rudolph, RAB Subcommittee Chair



California Regional Water Quality Control Board

Santa Ana Region



Linda S. Adams
Secretary for
Environmental Protection

3737 Main Street, Suite 500, Riverside, California 92501-3348
Phone (951) 782-4130 • FAX (951) 781-6288 • TDD (951) 782-3221
www.waterboards.ca.gov/santaana

Arnold Schwarzenegger
Governor

August 4, 2008

Base Realignment and Closure
Attn: Ms. Debra Theroux
Deputy Base Closure Manager
7040 Trabuco Road
Irvine, California 92618

**COMMENTS ON DRAFT EXPLANATION OF SIGNIFICANT DIFFERENCES, SITE 18
– REGIONAL VOLATILE ORGANIC COMPOUND (VOC) GROUNDWATER PLUME
(OPERABLE UNIT 1, SITE 24) – VOC SOURCE AREA (OPERABLE UNIT 2A)
VADOSE ZONE RESAMPLING, FORMER MARINE CORPS AIR STATION, EL TORO
GeoTracker No. SLT8R2654056**

Dear Ms. Theroux:

We have reviewed the above referenced document, dated May 29, 2008, which we received on June 2, 2008. This document is an explanation of significant differences to a record of decision of 2002 for Installation Restoration Program (IRP) Sites 18 and 24. IRP Site 24 is comprised of two media: soil and groundwater, with remedies documented in two separate records of decision. This document focuses on re-sampling of the vadose zone at the conclusion of groundwater remedial action. We have no comments.

For any questions, please call me at (951) 782-4494, or send email to jbroderick@waterboards.ca.gov.

Sincerely,


John Broderick
Site Cleanup/DoD Section

cc via electronic copy:

Richard Muza, U.S. EPA, Region 9 - muza.richard@epa.gov
Quang Than, Department of Toxic Substances - qthan@dtsc.ca.gov
Marc Smits, BRAC PMO West - marc.smits@navy.mil

California Environmental Protection Agency





Linda S. Adams
Secretary for
Environmental Protection



Department of Toxic Substances Control

Maureen F. Gorsen, Director
5796 Corporate Avenue
Cypress, California 90630



Arnold Schwarzenegger
Governor

August 22, 2008

Marine Corps Air Station El Toro
Base Realignment and Closure
Attn: Ms. Debra Theroux
Deputy Base Closure Manager
7040 Trabuco Road
Irvine, California 92618

DRAFT EXPLANATION OF SIGNIFICANT DIFFERENCES (ESD), SITE 18 REGIONAL VOLATILE ORGANIC COMPOUND (VOC) GROUNDWATER PLUME (OPERABLE UNIT 1) & SITE 24 VOC SOURCE AREA (OPERABLE UNIT 2A) VADOSE ZONE RESAMPLING, FORMER MARINE CORPS AIR STATION (MCAS) EL TORO, IRVINE, CALIFORNIA

Dear Ms. Theroux:

The California Department of Toxic Substances Control (DTSC) has reviewed the subject ESD dated May 2008. The ESD proposes to transfer a confirmation sampling step from the soil record of decision (ROD) to the groundwater ROD for Sites 18 and 24. The original soil ROD includes confirmation sampling of soil vapors in the deep vadose zone at the end of groundwater remediation to detect potential recontamination of the soil column by VOCs from contaminated groundwater. The ESD proposes to make the confirmation soil vapor sampling part of the groundwater ROD rather than of the soil ROD. The sampling will still be performed and the rationale for the sampling has not changed.

DTSC has no comments on the proposed ESD. Thank you for the opportunity to review the document. If you have any questions about this letter, please contact me at (714) 484-5352 or qthan@dtsc.ca.gov.

Sincerely,

Quang Than
Remedial Project Manager
Brownfields and Environmental Restoration Program

Ms. Debra Theroux
August 22, 2008
Page 2 of 2

cc: Content Arnold
BRAC PMO West
1455 Frazee Road, Suite 900
San Diego, California 92108

Marc Smits
BRAC PMO West
1455 Frazee Road, Suite 900
San Diego, California 92108

Robert Woodings
Restoration Advisory Board Co-chair
25550 Commercentre Drive, Suite 100
Lake Forest, California 92630

Marcia Rudolph
Restoration Advisory Board Subcommittee Chair
24922 Muirlands, #139
Lake Forest, California 92630

Richard Muza
U.S. Environmental Protection Agency Region IX
75 Hawthorne Street, Mail Code SFD-H8
San Francisco, California 94105-3901

John Broderick
California Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, California 92501-3339

Manny Alonzo
Department of Toxic Substances Control
5796 Corporate Avenue
Cypress, California 90630