

# **Final**

# First Five-Year Review of Remedial Actions





Prepared for:

Department of the Navy Base Realignment and Closure Program Management Office West San Diego, California

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# Final

# First Five-Year Review of Remedial Actions Former Naval Station Treasure Island San Francisco, California

#### Contract Number N62473-11-D-2205 Delivery Order 0058

Prepared for:

DEPARTMENT OF THE NAVY

Date:

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### ACRONYMS AND ABBREVIATIONS

μg/L	Micrograms per liter
$\mu g/m^3$	Micrograms per cubic meter
§	Section
ACM	Asbestos-containing material
ARAR	Applicable or relevant and appropriate requirement
AST	Aboveground storage tank
BCT	BRAC Cleanup Team
bgs	Below ground surface
BRAC	Base Realignment and Closure
Cal/EPA	California Environmental Protection Agency
Caltrans	California Department of Transportation
CCSF	City and County of San Francisco
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Chemical of concern
су	Cubic yard
DCE	Dichloroethene
DDT	Dichlorodiphenyltrichloroethane
DoD	U.S. Department of Defense
DTSC	Department of Toxic Substances Control
EBS	Environmental baseline survey
EPA	U.S. Environmental Protection Agency
ERRG	Environmental/Remediation Resources Group, Inc.
ESD	Explanation of significant differences
FFS	Focused feasibility study
FFSRA	Federal facility site remediation agreement
FHWA	Federal Highway Administration
FOSL	Finding of suitability to lease
FOST	Finding of suitability to transfer
FS	Feasibility study
FSS	Final status survey
HHRA	Human health risk assessment
HRA	Historical radiological assessment

# ACRONYMS AND ABBREVIATIONS (CONTINUED)

HRASTM	Historical radiological assessment supplemental technical memorandum
IC	Institutional control
IR	Installation Restoration
КСН	CH2M Hill Kleinfelder Joint Venture
L	Liter
LLRW	Low-level radioactive waste
LTM	Long-term monitoring
LUC	Land use control
MMEC	Multimedia Environmental Compliance Group
msl	Mean sea level
NAVSTA	Naval station
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
ng/kg	Nanograms per kilogram
NPL	National Priorities List
NTCRA	Non-time-critical removal action
O&M	Operation and maintenance
PA	Preliminary assessment
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PCE	Tetrachloroethene
PRB	Permeable reactive barrier
PRC	PRC Environmental Management, Inc.
RA	Remedial action
RACR	Remedial action completion report
RAO	Remedial action objective
RAP	Remedial action plan
RAWP	Remedial action work plan
RD	Remedial design
RI	Remedial investigation
RIP	Remedy in place
ROD	Record of decision
SARA	Superfund Amendments and Reauthorization Act
SFUSD	San Francisco Unified School District
Shaw	Shaw Environmental, Inc.

# ACRONYMS AND ABBREVIATIONS (CONTINUED)

SI	Site inspection
SLERA	Screening-level ecological risk assessment
SMP	Site management plan
SSSL	Site-specific screening level
SVOC	Semivolatile organic compound
SWDA	Solid waste disposal area
SWRCB	State Water Resources Control Board
TBC	To be considered
TCE	Trichloroethene
TCRA	Time-critical removal action
TEQ	Toxic equivalent
TI	Treasure Island
TIDA	Treasure Island Development Authority
TPH	Total petroleum hydrocarbons
USACE	U.S. Army Corps of Engineers
UST	Underground storage tank
VOC	Volatile organic compound
Water Board	Cal/EPA San Francisco Bay Regional Water Quality Control Board
WWTP	Wastewater treatment plant
YBI	Yerba Buena Island
ZVI	Zero-valent iron

#### EXECUTIVE SUMMARY

The Department of the Navy conducted this first five-year review for Naval Station Treasure Island (NAVSTA TI) in San Francisco, California, as required by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) in accordance with Section (§) 121(c), as amended, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), Part 300.430(f)(4)(ii) of the *Code of Federal Regulations* (CFR). The review was conducted in accordance with the Navy and Marine Corps Policy for Conducting CERCLA Statutory Five-Year Reviews (Navy 2011b), the Toolkit for Preparing Five-Year Reviews (Naval Facilities Engineering Command 2013), and the U.S. Environmental Protection Agency's (EPA) Comprehensive Five-Year Review Guidance (EPA 2001, 2011, 2012).

The report summarizes the evaluation of remedies and remedial actions that resulted in hazardous substances, pollutants, or contaminants remaining at sites above levels that allow for unlimited use and unrestricted exposure, and for which there is a final record of decision / remedial action plan (ROD/RAP). The CERCLA program at NAVSTA TI includes 24 sites. A ROD/RAP requiring a five-year review has been finalized for the following three NAVSTA TI sites:

- Site 21 Vessel Waste Oil Recovery Area, February 14, 2013
- Site 27 Clipper Cove Skeet Range, March 28, 2012
- Site 30 Daycare Center, August 5, 2009

A ROD/RAP has also been finalized for Site 31 (August 2009), but the ROD/Final RAP did not require a five-year review because all contaminated soil was to be removed and disposed of off site. Similarly, the explanation of significant differences (ESD) that added Site 33 to the Site 31 ROD/Final RAP did not require a five-year review because all contaminated soil was removed from Site 33 and disposed of off site. RODs requiring no further action have been completed for Sites 9, 10, 13, and 28 and these sites are, likewise, not subject to a five-year review.

The objective of this five-year review is to evaluate the selected remedies at three focus sites (Sites 21, 27, and 30) and conclude whether the remedies remain protective of human health and the environment in accordance with the requirements set forth in the ROD/Final RAPs. The principal method used to evaluate the protectiveness of the remedies was a review of various documents pertaining to site activities, analytical data, and findings. The methods, findings, and conclusions from the document reviews are presented in this five-year review report. In addition, this report identifies issues that may prevent a particular remedy from functioning as designed or appropriately, which could endanger the protection of human health and the environment. The overall evaluations of the effectiveness of each remedy are presented as protectiveness statements in the five-year review summary form provided below. The trigger date for this first five-year review is the date of the ROD/Final RAP for Site 30, August 5, 2009 (Navy 2009).

This five-year review includes all the sites at NAVSTA TI but focuses on those three sites where a remedial action has been taken and hazardous substances remain on site at levels that do not allow for unlimited use and unrestricted exposure (Sites 21, 27, and 30). This five-year review also includes a cursory review of all the sites at NAVSTA TI for overall context. Sites that are the focus of the five-year review (Sites 21, 27, and 30) are subject to the full technical assessment of remedy protectiveness while the remaining sites are described briefly to support the overall context of the cleanup at NAVSTA TI.

The following five-year review summary form provides additional information on the results of the review assessment and the effectiveness of the remedies implemented at NAVSTA TI.

F	age 1 of 2			
FIVE-YEAR REVIEW SUMMARY FORM				
SITE IDENTIFICATION				
Site Name: Naval Station Treasure Island				
EPA ID: CA7170023330				
Region: 9      State: California      City/County: San Francisco/San Francisco County	/			
SITE STATUS				
NPL status:    Image: Final    Image: Deleted    Image: Other (specify):    Non NPL Status				
<b>Remediation status</b> ( <i>choose all that apply</i> ):	ete			
Multiple OUs?    Yes    No    Construction completion date: varies by site				
Has site been put into reuse? 🛛 🗌 Yes 🖾 No				
REVIEW STATUS				
Lead Agency EPA State Tribe Other Federal Agency – U.S. Navy				
Author name: Timothy Mower				
Author title: Project Manager/Professional Geologist Author affiliation: TriEco-Tt JV				
<b>Review period:</b> <u>2009</u> to <u>2014</u>				
Date(s) of site inspection: June 19, 2014				
Type of review:      Post-SARA    Pre-SARA      Non-NPL Remedial Action Site    NPL-Removal only      Regional Discretion    NPL State/Tribe-lead				
<b>Review number:</b> $\square$ 1 (first) $\square$ 2 (second) $\square$ 3 (third) $\square$ Other (specify)				
Triggering action:    Actual RA Onsite Construction    Actual RA Start      Construction Completion    Previous Five-Year Review Report      Other (specify) Site 30 record of decision / final remedial action plan				
Triggering action date: <u>8/5/2009</u>				
<b>Due date</b> (five years after triggering action date): <u>8/5/2014</u>				

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#### FIVE-YEAR REVIEW SUMMARY FORM

ISSUES

Summarize issues:

1. All institutional controls (ICs) are not yet in place to protect the remedy at Site 27.

#### **RECOMMENDATIONS AND FOLLOW UP ACTIONS:**

Summarize recommendations and follow-up actions:

 An addendum to the land use control remedial design (LUC RD) for Site 27 is needed to address remaining ICs to protect the remedy. An addendum to the LUC RD is planned to be finalized in January 2015 to address other aspects of the ICs at Site 27 to protect the remedy, which may include signage, limits on vessel speed, and restrictions on dredging within the boundary of Site 27.

#### PROTECTIVENESS STATEMENT(S)

Protectiveness statements are presented below by site.

#### SITE 21, Vessel Waste Oil Recovery Area

The remedy for Site 21 is protective of human health and the environment. Soil gas and groundwater monitoring confirm that human health risk from the vapor intrusion pathway remains in the acceptable range. The IC performance objectives specified in the record of decision / final remedial action plan (ROD/Final RAP) are being met by access controls until the time of transfer to prevent potential exposure. The effective implementation of IC performance objectives through land use and activity restrictions incorporated into deeds and covenants to restrict use of property (CRUP) at the time of transfer will effectively prevent exposure to chemicals of concern (COC) and prevent activities that could damage the integrity of the remedy following transfer of the property.

#### SITE 27, Clipper Cove Skeet Range

The remedy for Site 27 is protective of human health and the environment. The rock armor layer is preventing exposure of diving ducks to lead shot in sediment within 75 feet of the shoreline. Site 27 does not pose a risk to human health because there is no pathway for exposure to humans. The IC performance objectives specified in the ROD/Final RAP are being met by access restrictions created by natural conditions (shallow water near shore) that minimize access by vessels that could potentially damage the rock armor layer. The effective implementation of IC performance objectives through land use and activity restrictions incorporated into deeds and CRUPs at the time of transfer will effectively prevent exposure to chemicals of ecological concern and provide controls for the continued protectiveness of the remedy.

#### SITE 30, Daycare Center

The remedy for Site 30 is protective of human health and the environment. The building foundation slab is preventing exposure to dioxins in soil. The IC performance objectives specified in the ROD/Final RAP are being met by access controls until the time of transfer to prevent potential exposure. The effective implementation of IC performance objectives through land use and activity restrictions incorporated into deeds and CRUPs at the time of transfer will effectively prevent exposure to COCs and prevent activities that could damage the integrity of the remedy following transfer of the property.

Notes:		
COC	Chemical of concern	
CRUP	Covenant to restrict use of property	
Dioxins	Polychlorinated dibenzo-p-dioxins	
IC	Institutional control	
LUC RD	Land use control remedial design	
RAP	Remedial action plan	
ROD	Record of decision	

### 1.0 INTRODUCTION

This report documents the results of the first five-year review conducted for Naval Station Treasure Island (NAVSTA TI) in San Francisco, California. The purpose of the five-year review is to evaluate whether the remedial actions implemented are protective of human health and the environment. The five-year review report presents the methods, findings, and conclusions of the review and documents a protectiveness determination. In addition, the five-year review report identifies issues found during the review and makes recommendations to address them.

The five-year review applies to all remedial actions selected pursuant to Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section (§) 121(c) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA § 121(c) states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

This requirement is further interpreted in the NCP, Title 40 *Code of Federal Regulations* (CFR) § 300.430(f)(4)(ii), which states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

Consistent with Executive Order 12580, the Secretary of Defense is responsible for ensuring that five-year reviews are conducted at all qualifying U.S. Department of Defense (DoD) cleanup sites. The Department of the Navy is authorized to conduct the five-year review for NAVSTA TI in accordance with CERCLA § 121 and the NCP. The Navy, through a contract with TriEco-Tt, conducted a five-year review of the remedial actions implemented at NAVSTA TI in San Francisco, California. The review was conducted from April through December 2014. This report documents the results of the review.

This five-year review includes all the sites at NAVSTA TI, but focuses on three sites (Sites 21, 27, and 30) where a record of decision / final remedial action plan (ROD/Final RAP) has been signed, a remedial action has been taken, and hazardous substances remain on site at levels that do not allow for unlimited use and unrestricted exposure. ROD/Final RAPs have also been

finalized for other sites but these sites do not require a five-year review because all contaminated soil was removed and disposed of off site (Sites 31 and 33) or no further action was required (Sites 9, 10, 13, and 28). This five-year review also includes a cursory review of all the sites at NAVSTA TI for overall context. Sites that are the focus of the five-year review (Sites 21, 27, and 30) are subject to the full technical assessment of remedy protectiveness while the remaining sites are described briefly to support the overall context of the cleanup at NAVSTA TI.

Since 1987, the CERCLA program at NAVSTA TI has evolved to include the following 24 sites, which are summarized below. The current program status for each site is included on the following table.

Site	Name/Description	Basis for Action	CERCLA Program Status	Five-Year Review Status
1	Medical Clinic	Silver in soil	Closed in 2002	Not included
2	Radiation Training Area	Radionuclides in soil	No further action recommended in 1988; contaminants merged with Site 12	Not included
3	PCB Equipment Storage Area	PCBs in soil	Closed in 2002	Not included
5	Old Boiler Plant	Fuels in soil and groundwater	Closed; CERCLA contaminants merged into Site 24 in 2001	Not included
6	Fire Training School	VOCs, PAHs, fuels, dioxins, and furans in soil and groundwater	ROD/Final RAP in preparation	Not included; may be included in future report
7	Pesticide Storage Area	Metals, pesticides, and herbicides in soil	Closed in 2005	Not included
8	Army Point Sludge Disposal Area	SVOCs and metals in soil	RI; on hold pending completion of bridge reconstruction	Not included; may be included in future report
9	Foundry	Iron and PAHs in soil	Closed; no-action ROD signed in 2007	Not included
10	Bus Painting Shop	Iron and PAHs in soil	Closed; no-action ROD signed in 2007	Not included
11	YBI Landfill	Waste in place, VOCs, PAHs, fuels, and metals in soil	RI; on hold pending completion of bridge reconstruction	Not included; may be included in future report
12	Old Bunker Area	Waste in place, PCBs, PAHs, dioxins, metals, and radionuclides in soil; arsenic and fuels in groundwater	FS Addendum in preparation; waste removals and radiological surveys in progress	Not included; may be included in future report
13	Storm Water Outfalls/ Offshore Sediments	Metals, PCBs, PAHs, and pesticides in sediment	Closed; no-action ROD signed in 2005	Not included

TABLE 1: CERCLA SITES

Site	Name/Description	Basis for Action	CERCLA Program Status	Five-Year Review Status
17	Tanks 103/104	Fuels, oils, and lubricants in soil and groundwater	Closed; CERCLA contaminants merged into Site 24 in 2001	Not included
18	Possible ACM on YBI	Asbestos in soil	No further action recommended in 1988	Not included
21	Vessel Waste Oil Recovery Area	VOCs in soil and groundwater	RIP (LTM and LUCs)	Included in this report
23	YBI Fuel Line Rupture/Landslide	Fuels in soil	No further action recommended in 1988	Not included
24	Dry Cleaning Facility	Chlorinated VOCs in soil and groundwater	Proposed Plan/Draft RAP in preparation	Not included; may be included in future report
27	Clipper Cover Skeet Range	Lead shot in sediment	RIP (LTM and LUCs)	Included in this report
28	West Side On/Off Ramp	Lead in soil	Closed; no-action ROD signed in 2010	Not included
29	East Side On/Off Ramp	Lead and SVOCs in soil	RI; on hold pending completion of bridge reconstruction	Not included; may be included in future report
30	Daycare Center	Dioxins in soil	RIP (LTM and LUCs)	Included in this report
31	Former South Storage Yard	Lead, PAHs, and dioxins in soil	Remedy completed in accordance with ROD/Final RAP signed in 2009	Not included
32	Former Training and Storage Area	PCBs, dioxins, pesticides, arsenic, and radionuclides in soil	ROD/Final RAP on hold pending radiological surveys; no further action needed for nonradiological chemicals	Not included; may be included in future report
33	Water Line Replacement Area	Lead in soil	Closed; remedy completed and RACR signed in 2014	Not included

Notes:

1. Sites not listed in this table are not part of the CERCLA program.

2. Orange shading indicates sites that are the focus of this five-year review.

3. Green shading indicates sites that do not yet have a ROD/RAP and may be included in a future five-year review if hazardous substances remain on site at levels that do not allow for unlimited use and unrestricted exposure.

4. Sites with no shading are closed and a five-year review is not necessary; these sites are included for overall context.

ACM	Asbestos-containing material	PCB	Polychlorinated biphenyl
CERCLA	Comprehensive Environmental Response,	RACR	Remedial action completion report
	Compensation, and Liability Act	RAP	Remedial action plan
Dioxins	Polychlorinated dibenzo-p-dioxins	RI	Remedial investigation
ESD	Explanation of significant differences	RIP	Remedy in place
FS	Feasibility study	ROD	Record of decision
LTM	Long-term monitoring	SVOC	Semivolatile organic compound
LUC	Land use control	VOC	Volatile organic compound
PAH	Polycyclic aromatic hydrocarbon	YBI	Yerba Buena Island

This first five-year review for NAVSTA TI summarizes the significant work conducted by the Navy in collaboration with the regulatory agencies, including the U.S. Environmental Protection Agency (EPA), the California Environmental Protection Agency (Cal/EPA) Department of Toxic Substances Control (DTSC), and the Cal/EPA Regional Water Quality Control Board, San Francisco Bay Region (Water Board). This review is triggered by the ROD/Final RAP for Site 30, which was signed on August 5, 2009 (Barajas and Associates 2009a).

Five-year reviews are required for NAVSTA TI because (1) ongoing and completed remedial actions have left contaminants in place above concentrations that would allow for unlimited use and unrestricted exposure, and (2) the decision documents were signed on or after October 17, 1986 (the effective date of the Superfund Amendments and Reauthorization Act [SARA]).

After this introduction, this five-year review report is organized in the following sections:

- Section 2.0, Site Chronology, summarizes the sequence of events at each site.
- Section 3.0, Background, describes background information for each site, including physical characteristics, land use, contamination history, and the basis for taking action.
- Section 4.0, Remedial Actions, presents remedial actions implemented in accordance with the ROD/Final RAPs.
- Section 5.0, Progress Since Last Five-Year Review, is a placeholder in this document because this is the first five-year review. This section is included to be consistent with EPA guidance (EPA 2001) and to facilitate future five-year review reports.
- Section 6.0, Five-Year Review Process, describes the five-year review process, including administrative process, community notification and involvement, document review, data review, site inspections, and interviews.
- Section 7.0, Technical Assessment, presents the analysis of whether the remedies are functioning as intended, whether exposure assumptions and cleanup levels used at the time of the ROD/Final RAPs are still valid, and whether any new information has come to light to suggest the remedies may not be protective.
- Section 8.0, Issues, Recommendations, and Follow-up Actions, provides issues and recommended actions based on the technical assessment.
- Section 9.0, Protectiveness Statement, lists the protectiveness statement for each site.
- Section 10.0, Next Review, provides the schedule for the next five-year review.
- Section 11.0, References, lists the documents used to prepare this five-year review report.

Figures are presented after Section 11.0. Appendices containing supporting information are presented after the figures. Appendix A contains the interview forms. Appendix B provides responses to comments received on the draft five-year review report. Appendix C contains the bibliography listing documents reviewed in support of this five-year review. Appendix D provides the site inspection checklist. Appendix E contains the photographic log, documenting observations made during the five-year review site inspection.

#### 2.0 CHRONOLOGY OF SITES

This section summarizes events in the history of contaminant detection, characterization, and remediation at Sites 21, 27, and 30 at NAVSTA TI. The following table is organized by site and presents a summary of major events. Basewide information is also included to provide overall context.

Event	Date
Basewide	
U.S. government takes possession of Yerba Buena Island (YBI); U.S. Army operations begin	1867
Navy operations begin	1898
Naval training activities at YBI	1898 to 1923
Treasure Island (TI) constructed by U.S. Army Corps of Engineers	1936 to 1937
Golden Gate International Exposition held at TI	1939 to 1940
City and County of San Francisco (CCSF) leases TI to Navy for wartime operations	1941
Navy acquires TI in land exchange with CCSF	1942
Naval Station TI (NAVSTA TI) operations (training, administration, housing and other support to U.S. Pacific Fleet)	1941 to 1997
Basewide preliminary assessment and site inspection	1987
Federal Facility Site Remediation Agreement signed	September 29, 1992
Closure recommended under the Base Realignment and Closure program	1993
Basewide environmental baseline survey (EBS)	1995
Formal closure of NAVSTA TI	September 30, 1997
Supplemental EBS	July 2005
Historical radiological assessment (HRA)	February 2006
Finding of suitability to transfer (FOST) for about 169 acres at TI	February 2006
FOST for about 77 acres at YBI	March 2006
Agreement on terms of transfer from Navy to the Treasure Island Development Authority	August 2010
FOST for about 12 acres at YBI	January 2012

#### TABLE 2: CHRONOLOGY OF SITES

Event	Date
Basewide (Continued)	
Final HRA supplemental technical memorandum (HRASTM)	July 2014
Economic development conveyance memorandum of agreement	July 2, 2014
FOST for about 561 acres of TI uplands and submerged lands	October 2014
Site 21 Vessel Waste Oil Recovery Area	
Vessel waste oil recovery operations	1946 to 1995
Phase I remedial investigation (RI)	1992
Investigation of inactive fuel line	1994
Phase II RI	1997
Additional investigation of dip tank in southeastern portion of Building 3	2001 to 2002
Final RI	February 2007
Final focused feasibility study (FS)	February 2009
Groundwater treatability studies of in situ anaerobic bioremediation	2005 to 2010
Phase 1: injection of sodium lactate, hydrogen, and EHC (combination of carbon and zero-valent iron)	August 2005 to May 2006
Phase 2: injection of lactic acid and a proprietary nutrient mix using direct push	June 2008 to April 2010
Soil gas survey and human health risk assessment addendum	November 2012
Record of decision (ROD) / final remedial action plan (RAP) (institutional controls [IC] and groundwater and soil gas monitoring)	February 14, 2013
Final land use control (LUC) remedial design/remedial action work plan (RD/RAWP)	October 2013
Annual LUC inspections	March 27, 2014 and ongoing
Final remedial action completion report (RACR)	December 2014
Site 27 Clipper Cove Skeet Range	
Skeet range operations	1979 to 1989
San Francisco Regional Water Quality Control Board Order 93-130 requiring Navy to investigate and manage contamination	1993
Phase I RI	1993
Offshore sampling for lead and lead shot	1996
Phase II RI (included bioassays and pore water sampling)	1997
Final RI	2001
Investigation of lead and polycyclic aromatic hydrocarbons in onshore soil	2004
Hydrographic survey to evaluate depositional dynamics in sediment	2005
Investigation of lead shot within 150 feet from shoreline	March 2008
Revised draft FS	December 2008
Site boundary change to exclude upland portion of the site	August 2010
Final FS	August 2010
ROD/Final RAP (focused dredging, backfill, offsite disposal, backfill monitoring, ICs)	March 28, 2012

Event	Date
Site 27 Clipper Cove Skeet Range (Continued)	
Final RD	May 2013
Remedial action	July 2013 to February 2014
Final RACR	November 2014
Site 30 Daycare Center	
Construction of Navy daycare center (Building 502)	1985
Closure of Navy operation and finding of suitability to lease for CCSF	1997
Discovery of "buried trash" on historical drawing, exploratory trenching, and identification of contaminated soil and burned debris	2002
Site added to the CERCLA program	2002
Time-critical removal action; removal of soil and debris and construction of concrete pad adjacent to daycare center	2002
Daycare center reopens	2003
Groundwater investigation finds no chemicals above screening criteria	2004
Final RI	February 2006
Final FS	November 2006
ROD/Final RAP (maintain building foundation slab and ICs)	August 5, 2009
Final LUC RD/RAWP	November 2010
Annual LUC inspections	January 26, 2011 February 24, 2012 January 23, 2013 March 26, 2014
	and ongoing
Inclusion in radiological program based on HRASTM finding that Site 30 is located within a former storage yard	July 2014
Radiological survey	Planned 2015

# 3.0 BACKGROUND

This section describes potential threats posed to the public and environment that were identified when the ROD/Final RAPs for the various sites at NAVSTA TI were developed. This section facilitates comparison of the performances of selected remedies with site conditions the remedies were intended to address. General site conditions and all major cleanup activities for each site before its ROD/Final RAP was signed are discussed, including physical characteristics, land and resource use, history of contamination, initial responses, and basis for taking action.

#### 3.1 PHYSICAL CHARACTERISTICS

NAVSTA TI is located in the San Francisco Bay in the City and County of San Francisco (CCSF), midway between San Francisco and Oakland, California (Figure 1). The former naval

station consists of two contiguous islands connected by a causeway: the northern island (TI) encompasses approximately 403 acres, and the southern island (Yerba Buena Island [YBI]) encompasses approximately 147 acres. The U.S. Coast Guard owns 30 of the 147 acres that make up YBI. The approximate area of each site discussed in this five-year review is listed below.

Site	Area (acres)
21	2.2
27	18.9
30	1.5

# 3.1.1 Geography

The Navy divided NAVSTA TI into smaller areas based on similar historical activities to facilitate investigation and remediation. These areas are known as Installation Restoration (IR) sites and are investigated under CERCLA. Figure 2 shows the locations of the sites.

Over 1,800 people live on TI and YBI, including about 100 on YBI. Currently, residents are located either within Site 12, also known as the TI Housing Area, or on YBI. The majority of NAVSTA TI residents live in former Navy housing. In addition to residential leases, numerous buildings are subleased from the Treasure Island Development Authority (TIDA) to commercial tenants (TriEco-Tt 2013b).

# 3.1.2 Topography

TI is a man-made island constructed of materials dredged from the bay. The topography of TI is characterized by flat, relatively level lowlands ranging in elevation from about 6 to 14 feet above mean sea level (msl) and sloping down to msl at the bay. The perimeter berm around TI generally ranges from 10 to 14 feet above msl. Landscaped areas on TI include mature ornamental trees, shrubs, and grasses. The shoreline at TI consists of riprap (CCSF Planning Department 2011).

YBI is a natural island. The existing ground elevations on YBI range from sea level at the shoreline to 340 feet above msl near the middle of the island and include slopes ranging from 5 to 75 percent. YBI contains landscaped areas, non-native eucalyptus stands, and several types of native habitat. The native vegetation communities are mainly on the western and northern edges of the island (CCSF Planning Department 2011). The shoreline at YBI consists of natural rocky shores and a narrow sandy beach along Clipper Cove.

#### 3.1.3 Geology

TI is a relatively flat man-made island, consisting primarily of sand dredged from the bay and retained by a perimeter of rock and sand dikes. Dredging and construction of TI, directed by the U.S. Army Corps of Engineers (USACE), began in 1936 and was completed in 1937. TI was

constructed on the Yerba Buena Shoals, a 735-acre sand spit extending north and northwest of YBI. To build the island, the USACE constructed a perimeter of rock and filled it with millions of tons of silt dredged from the bay and delta (Lee 1969). Subsurface materials at TI can be divided into the following five units, listed from youngest to oldest:

- Fill (Dredged Sand Fill)
- Shoal Sands (Yerba Buena Shoal Sands)
- Younger Bay Mud
- Older Bay Mud
- Franciscan Assemblage

These units exist in a simple "layer-cake" stratigraphy at TI. The dredged fill and shoal sands act as an unconfined aquifer at TI. (See additional information on hydrogeology in the next section.)

# 3.1.4 Hydrogeology

Groundwater at TI is unconfined, with an average depth to the water table of approximately 6.5 feet below ground surface (bgs). Groundwater recharge occurs primarily from infiltration of precipitation, with some contribution from landscape irrigation. Perched groundwater conditions may exist locally above the shallow water table because of the presence of relatively impermeable silt and clay lenses. Likewise, the overall aquifer is subdivided at some sites based on local low-permeability horizons within the fill and shoal sands. For example, groundwater is divided into two water-bearing zones at Site 21. The shallow A zone, located between 3.5 and 13.5 feet bgs, is composed of dredged fill. The intermediate B zone, located between 16.5 and 28 feet bgs, is composed of shoal deposits (SulTech 2009a).

Groundwater flow is radial from the center of TI toward the shoreline. Groundwater flow gradients are low, ranging from 0.001 to 0.002 (PRC Environmental Management, Inc. [PRC] 1995). Tidal fluctuations influence the hydraulic gradient at locations within 200 to 250 feet from the shoreline. Temporary tidal effects on groundwater produce a steeper groundwater gradient after low tide and a decline of and reversal in the groundwater gradient after high tide (PRC 1995; Tetra Tech EM Inc. 2002). Measurements made in December 2013 indicated the hydraulic gradient at Site 21 ranged from 0.002 to 0.005, directed toward the shoreline from inland locations. Closer to the shore, the gradient reversed, flowing away from the shoreline with an average gradient ranging from 0.005 to 0.01 (Trevet 2014).

Tidal mixing also affects groundwater at TI. Based on the results of a tidal mixing zone study in 2001, it was estimated that physical mixing of surface water and groundwater takes place over distances that ranged from 60 to 150 feet inland from the shoreline. Estimates of the degree of tidal mixing of surface water and groundwater for TI ranged from 10 to 17 percent at wells positioned about 50 feet from the shoreline, except at a transect at Site 21 in the southeastern portion of TI. Tidal mixing was conservatively estimated at 43 percent at a transect in Site 21;

however, conditions encountered in this transect are considered unusual and representative only of the area immediately surrounding that transect (Tetra Tech EM Inc. 2002).

Groundwater at TI is not suitable as a potential source of drinking water pursuant to California State Water Resources Control Board (SWRCB) Resolution 88-63 and Water Board Resolution 89-39 (Water Board 2001).

## 3.1.5 Basis for Taking Action

Chemicals of concern (COC) in soil, sediment, soil gas, and groundwater pose potentially unacceptable risk to human health and the environment at NAVSTA TI. Table 3 lists these COCs and contaminated media. Table 3 includes COCs estimated to pose a risk for carcinogens greater than 10<sup>-6</sup> or a hazard index greater than 1 for noncarcinogens. Significant exposure pathways that resulted in the highest levels of risk to human health include exposure to metals and organic chemicals (especially polychlorinated dibenzo-p-dioxins, collectively referred to as dioxins in this report) in soil and exposure to volatile organic compounds (VOC) in soil gas (from either soil or groundwater) via vapor intrusion into indoor air. Exposure to VOCs in groundwater through dermal contact to a construction worker in a trench also resulted in potentially unacceptable risks. Exposure to metals (lead shot) in shoreline sediment posed risk to ecological receptors at Site 27.

		Site	9	
	2	1	27	30
Chemical	Groundwater, vapor intrusion	Groundwater, dermal contact in trench	Sediment, ecological (lead shot)	Soil
Cis-1,2-Dichloroethene	Х			
Dioxins				Х
Lead			Х	
Tetrachloroethene	Х	Х		
Trichloroethene	X			
Vinyl Chloride	Х			

|--|

# 3.2 LAND AND RESOURCE USE

<u>**Current land uses</u>**. Current land uses at NAVSTA TI include residential housing, educational and training facilities, public services (police, fire station, post office, and wastewater treatment), offices, commercial and industrial uses (for example, wineries and film and television production), and open space and recreational uses, including the marina at Clipper Cove. The Job Corps campus, which is owned and operated by the U.S. Department of Labor, occupies approximately 37 acres in the central portion of TI. This facility was formerly used to screen military personnel. Job Corps is a residential, live-in program that offers career planning,</u>

on-the-job training, job placement, housing, food service, and childcare programs. Finally, the former and current Bay Bridge alignments occupy land on YBI.

Various industrial activities at NAVSTA TI — including degreasing, painting, foundry operations, equipment storage, dry cleaning, and other industrial operations as well as fire and radiological decontamination training — have resulted in a broad distribution of chemicals in soil and groundwater. These chemicals include VOCs; semivolatile organic compounds (SVOC) including polycyclic aromatic hydrocarbons (PAH), polychlorinated biphenyls (PCB), dioxins, and pesticides; total petroleum hydrocarbons (TPH); metals; and radionuclides.

<u>Future land uses</u>. The final environmental impact report for the TI and YBI redevelopment project (CCSF Planning Department 2011) considered a variety of reuse options. Planned land uses include residential, retail, commercial offices, hotels, and open space and recreational uses such as parks, public plazas, cultural areas, athletic fields, and greenways.

<u>Surface water and groundwater use</u>. No permanent surface water features exist at NAVSTA TI. Surface water runoff flows to nearby San Francisco Bay or percolates through the soil. Groundwater beneath NAVSTA TI is not currently used for drinking water, irrigation, or industrial supply. Drinking water is supplied to NAVSTA TI by CCSF through its municipal supply from the Hetch Hetchy watershed in the Sierra Nevada.

Under the San Francisco Bay Basin Water Quality Control Plan (Water Board 2011), all groundwater within the Bay Basin that meets the criteria in SWRCB Resolution 88-63 has a potential beneficial use for municipal or domestic supply (SWRCB 1988). However, the Water Board conducted a "Pilot Beneficial Use Designation Project" for several groundwater basins in San Francisco and northern San Mateo County, including NAVSTA TI (Water Board 1996). Results of the Water Board's report indicated the use of groundwater for municipal and domestic supply at NAVSTA TI would be limited by (1) the small volume of fresh groundwater available, (2) the likelihood of saltwater intrusion, and (3) the potential future ground improvements for stability (such as stone columns and dynamic compaction). Consequently, the report recommended that the Bay Basin Water Quality Control Plan be revised to no longer designate groundwater at NAVSTA TI as a potential municipal or domestic water supply, but to retain its designation for potential agricultural, process, and industrial supply (Water Board 2001). The Water Board has concurred with the Navy that groundwater at NAVSTA TI is not a potential source of drinking water pursuant to SWRCB Resolution 88-63 and Water Board Resolution 89-39.

Future drinking water is expected to continue to be supplied by the city's municipal system. The Site 21 ROD/Final RAP requires institutional controls (IC) to prohibit the use of groundwater and, consequently, future use of groundwater is expected to be prohibited, except for uses allowed by the ROD/Final RAP (for example, dewatering).

**Ecologically sensitive areas at TI**. TI is not a natural ecosystem; rather, it is a manmade island built from dredge material from the bay. TI has never supported a natural ecosystem or provided habitat for ecologically relevant receptors. The Navy completed a screening-level ecological risk

assessment (SLERA) for Sites 6, 12, 21, 24, 30, 31, 32, and 33 (SulTech 2007b). The SLERA did not identify any ecological resources or processes at these sites at TI that needed to be protected or sustained and did not recommend further evaluation of ecological risk.

The ecological risk assessment for Site 27 concluded there was a current risk to diving ducks from ingestion of lead shot in sediment near the shoreline. This risk was the driver for the remedial action at Site 27 (see Section 4.2). The remaining offshore area at NAVSTA TI is included in Site 13. The remedial investigation (RI) report for Sites 13 and 27 (Tetra Tech EM Inc. 2001d) recommended no action for Site 13, and a no-action ROD for Site 13 was signed in 2005 (Navy 2005a).

**Ecologically sensitive areas at YBI**. The Navy conducted a SLERA for Sites 8, 11, 28, and 29 at YBI as part of the Draft Final Onshore Operable Unit RI Report (PRC 1997). The SLERA evaluated three representative species: deer mouse (*Peromyscus maniculatus*), American kestrel (*Falco sparverius*), and American peregrine falcon (*Falco peregrinus anatum*). The results of the SLERA indicated potential risk to the peregrine falcon under conservative exposure and effects conditions at Sites 8, 11, 28, and 29. The regulatory agencies recommended a validation study using chemical concentrations in bird tissue collected at the site to further evaluate potential risk to the peregrine falcon, and no further ecological investigations were recommended (Tetra Tech EM Inc. 2001c).

#### 3.3 HISTORY OF CONTAMINATION AND INITIAL RESPONSES

Activities at NAVSTA TI included a variety of industrial operations. Wastes from these operations were disposed of in an industrial landfill (now Site 11) as well as released at other locations across the base, including solid waste disposal areas (SWDA) at Site 12 and transformer and other equipment storage areas. From 1941 through 1997, contaminant releases occurred during site operations by the Navy; however, specific dates of releases are not known. Contaminant releases have been evidenced by a variety of organic and inorganic chemicals discovered in soil, sediment, soil gas, and groundwater at levels exceeding cleanup goals in the various ROD/Final RAPs.

Exposures to chemicals in soil, sediment, soil gas, and groundwater are associated with significant potential risk to human health. Human health risk assessments (HHRA) for the various sites evaluated exposures to industrial and construction workers as well as potential future residents and recreational users. VOCs, PAHs, PCBs, dioxins, and metals were associated with the highest levels of potential risk. Likewise, chemicals in shoreline sediment have the potential to affect aquatic life in San Francisco Bay; metals (lead shot) were associated with the highest levels of potential risk for aquatic receptors. These potentially unacceptable risks were the basis for taking action to remediate the contaminated media (soil, sediment, soil gas, and groundwater) at NAVSTA TI.

Initial activities at NAVSTA TI occurred across the base and included:

- Mid-1980s: Initial discovery of problem or contamination.
- **1987:** Basewide preliminary assessment and site inspection (PA/SI) (Dames and Moore 1988).
- **1992:** Federal Facility Site Remediation Agreement (FFSRA) signed (Navy 1992).
- **1992 through 1997:** Remedial investigation, Phases I, IIA, and IIB (PRC 1997).
- **1993:** Designated for closure under the Base Realignment and Closure (BRAC) Program.
- **1995:** Environmental baseline survey (ERM-West 1995a).

The following sections describe the history of investigations and initial cleanup responses at each site. IR sites that have been combined under the CERCLA program are discussed under the combined site. For example, the CERCLA contaminants at Sites 5 (Old Boiler Plant) and 17 (Tanks 103 and 104) were combined into Site 24, and information about Sites 5 and 17 is included in the Site 24 discussion (see Section 3.3.2.5). Sites 1 through 26 were identified during the 1987 PA/SI (Dames and Moore 1988). Other sites were added later, as discussed in the following sections. Sites 4/19, 14/22, 15, 16, 20, 25, and 26 were transferred from the CERCLA program to the Petroleum program and are not discussed in this five-year review. Remedial actions taken after the ROD/Final RAPs are described in more detail in Section 4.0.

Sites at NAVSTA TI are divided into three general groups in the following sections.

- 1. Sites where a ROD/Final RAP has been signed, a remedial action has been undertaken, and hazardous substances remain on site at levels that do not allow for unlimited use and unrestricted exposure. These sites are the focus of this five-year review. This subsection includes Sites 21, 27, and 30.
- 2. Sites where a ROD/Final RAP has not yet been completed. These sites may be included in a future five-year review if hazardous substances remain on site at levels that do not allow for unlimited use and unrestricted exposure. This subsection includes Sites 6, 8, 11, 12, 24, 29, and 32.
- 3. Sites that are closed and where a five-year review is not necessary because no hazardous substances remain on site above levels that allow for unlimited use and unrestricted exposure. These sites are included for overall context. This subsection includes Sites 1, 2, 3, 7, 9, 10, 13, 18, 23, 28, 31, and 33.

### 3.3.1 Sites Included in This Five-Year Review

The following subsections describe the three sites that are the focus of this five-year review (Sites 21, 27, and 30). Later subsections discuss sites that may be included in future five-year reviews (Section 3.3.2) and sites for which a five-year review is not needed (Section 3.3.3).

#### 3.3.1.1 Site 21, Vessel Waste Oil Recovery Area

The vessel waste oil recovery area operated between 1946 and 1995. Waste oil from ships was unloaded into floating cylindrical steel shells called "donuts." The waste oil was transferred from the "donuts" to an onshore oil-water separation facility at Site 21. The separation facility consisted of five aboveground tanks, each with a capacity of 2,000 gallons. These tanks were removed in 1995. The separation system was maintained on a paved area that was reportedly heavily stained, but little staining is still visible. Analytical data from the sampling of monitoring wells at Site 21 demonstrated no pattern of elevated levels of TPH in groundwater.

Building 3, near the waste oil recovery area, was used for various activities, including aircraft maintenance and ship repair activities. A dip tank to clean aircraft parts was reportedly located at the southeastern corner outside of Building 3. No records are available that describe the types and quantities of chemicals used or disposed of during parts cleaning operations; however, use of the solvents tetrachloroethene (PCE) and trichloroethene (TCE) as degreasing agents for cleaning metal parts was widespread at the time of Navy operations. Contamination of groundwater at Site 21 is believed to be from small spills of PCE and TCE in the dip tank area during former parts cleaning operations.

In addition to the basewide actions, activities at Site 21 included:

- August 2001 to May 2002: Focused investigation of a former dip tank located on the southeastern side of Building 3 as a potential source for VOC contamination in soil and groundwater. Soil samples were collected from 10 borings, and 13 new monitoring wells were installed and sampled to evaluate the extent of contamination in groundwater (SulTech 2009a).
- August 2005 to May 2006: Phase 1 of the groundwater treatability study. About 15,800 pounds of 60 percent sodium lactate solution with bioaugmentation was injected at 45 injection point wells during August to October 2005. The injected solution used water from the base water-supply system as make-up water. A permeable reactive barrier (PRB) was installed near the downgradient end of the VOC plume in August 2005 by injecting EHC at six direct-push locations. EHC is a patented formulation of an organic carbon substrate and zero-valent iron (ZVI) as a very fine-grained powder. Direct injection of hydrogen was evaluated at seven wells during October and November 2005. Groundwater monitoring to evaluate remediation progress continued to May 2006 (Shaw Environmental, Inc. [Shaw] 2011a).

• June 2008 to April 2010: Phase 2 of the groundwater treatability study. About 24,300 pounds of 88 percent lactic acid and a proprietary nutrient mix with bioaugmentation was injected at 32 direct-push locations during February 2009 (photograph at right). The injected solution used site groundwater as make-up water. Groundwater monitoring to evaluate the progress of



remediation continued to April 2010 (Shaw 2011a). Both phases of the treatability study reduced concentrations of VOCs in groundwater and the PRB was effective in preventing VOCs from migrating to the bay.

• November 2010 to January 2011 and November 2011 to February 2012: Soil gas surveys. The first round of soil gas samples included eight locations over the plume of VOCs in groundwater. The second round included samples from these eight locations plus 23 new locations, including subslab samples from 11 locations inside of Buildings 3 and 111 (Shaw 2012d).

Refer to Section 4.1 for the remaining history of the remedial action at Site 21.

#### 3.3.1.2 Site 27, Clipper Cove Skeet Range

A portion of Clipper Cove was used as a naval skeet range from about 1979 until 1989. Naval personnel fired lead shot over the water as clay skeet targets were launched from the shoreline. The positions of the shooters and the angles the skeet targets were thrown resulted in a fanshaped shot fall zone that defines the site boundary. The site forms a rough semicircle out into the bay with a radius of about 700 to 750 feet. In 1993, the Clipper Cove Skeet Range was identified as a potential environmental concern, based on Water Board Order 93-130 "Site Cleanup Requirements for NAVSTA TI Skeet Range."

In addition to the basewide actions, activities at Site 27 included:

- **1996:** Offshore sampling to evaluate the extent of lead shot and investigate concentrations of lead and PAHs in offshore sediment and the overlying surface water (Tetra Tech EM Inc. 2001d).
- **1997:** Offshore sampling of sediment and pore water, including invertebrate bioassays and tissue residue analysis (Tetra Tech EM Inc. 2001a).
- **2004:** Onshore trenching for broken clay targets to investigate potential PAH concentrations in soil. Broken clay targets were observed in five trenches, and soil sample results indicated PAH concentrations below site screening levels (Shaw 2005).

- **2005:** A hydrographic survey found that Site 27 is a low-energy depositional environment, except for the area within 150 feet of the shoreline. Deposition in the nearshore area may be limited by wave action and currents as a result of the shallower water. The remainder of Clipper Cove is a depositional environment where sediment accumulates at a rate of about 1 to 2 inches each year (SulTech 2005b).
- March 2008: An additional investigation of lead shot in the nearshore area concluded that lead shot was buried by as little as 1 foot of sediment at some nearshore locations (Tetra Tech EM Inc. 2010b). Lead shot in this nearshore sediment poses a potential risk to diving ducks via incidental ingestion.
- July 2013 to February 2014: Remedial action in the nearshore area at Site 27.

Refer to Section 4.2 for the remaining history of the remedial action at Site 27.

#### 3.3.1.3 Site 30, Daycare Center

Site 30, Daycare Center (Building 502), is located south of the Treasure Island Elementary School, east of the corner of Avenue D and 11<sup>th</sup> Street. The site was undeveloped until the Navy's former daycare center was built in 1985. After NAVSTA TI closed, the Treasure Island Daycare Center was leased to CCSF under a finding of suitability to lease (FOSL) on July 29, 1997 (ERM-West 1995b). The current daycare center was remodeled into its current configuration and reopened on March 17, 2003.

As part of the environmental baseline survey (EBS) to support leasing the daycare center, the Navy reviewed a 1989 as-built drawing of the water lines in the area; the drawing noted the comment "buried trash" along 11<sup>th</sup> Street.

In addition to the basewide actions, activities at Site 30 included:

- **May to September 2002:** A series of exploratory trenching investigations identified various types of wastes, including burned debris that contained lead and dioxins at levels exceeding the site soil screening levels (Shaw 2003).
- July 2002: Time-critical removal action (TCRA). About 200 cubic yards (cy) of soil and debris were removed on the south side of 11<sup>th</sup> Street. A 6-inch-thick concrete pad with a 2-inch-thick asphalt layer (jointly termed the "Site 30 Concrete Pad") was installed over a 1,400-square-foot area adjacent and west of Building 502 where soil samples had indicated higher concentrations of dioxins (Shaw 2003).
- **May 2004:** Two groundwater monitoring wells were installed and sampled for analysis of VOCs, SVOCs (including pesticides, PCBs, and dioxins), TPH, and metals. No chemicals were detected at concentrations exceeding groundwater screening criteria (Shaw 2004a).

Refer to Section 4.3 for the remaining history of the remedial action at Site 30.

### 3.3.2 Sites That May Be Included in a Future Five-Year Review

This subsection briefly describes sites that have not yet completed a ROD/Final RAP and may be included in future five-year reviews if hazardous substances remain on site at levels that do not allow for unlimited use and unrestricted exposure. The following seven sites are discussed below: 6, 8, 11, 12, 24, 29, and 32.

#### 3.3.2.1 Site 6, Fire Training School

Site 6, the former Navy firefighting training school, was used for nearly 50 years (1944 to 1992) for various firefighting training activities. Site 6 is located in the northeastern corner of TI, north of 14<sup>th</sup> Street between Avenues L and M.

The training school formerly included 10 buildings, six underground storage tanks (UST), one aboveground storage tank (AST), and a central concrete-paved training pad and surrounding collector trench. Fires fueled with diesel and gasoline, magnesium, and wood were set in various mockups in the training yard and were extinguished with a mixture of water and biodegradable emulsifiers. Approximately 18,700 gallons of gasoline and 31,500 gallons of diesel fuel were used, and approximately 14,000 gallons of petroleum residue were generated at Site 6 each year (Environmental/Remediation Resources Group, Inc. [ERRG] 2012). During remedial excavation for petroleum in 2002 at the UST 248 area, results from soil confirmation samples included dioxins and furans above screening levels, causing Site 6 to be transferred to the CERCLA program in 2003.

In addition to the basewide actions and investigations and removals completed under the petroleum program, activities under CERCLA at Site 6 included:

- **December 2007 to April 2008:** Investigation of the concrete pads and surrounding soil near two pad-mounted transformers and removal of one transformer (Shaw 2009).
- August to September 2010: Data gaps investigation of soil, groundwater, and soil gas to further define the nature and extent of chemicals at the site (ERRG 2012).
- **February 2014:** Final proposed plan including excavation and off-site disposal of unsaturated zone soil, groundwater monitoring, and ICs (Navy 2014a).

<u>Current status</u>: The Navy is preparing a ROD/RAP for Site 6 to select the final cleanup action (Navy 2014b). The Navy is also conducting a radiological survey of Site 6, as this area was considered impacted in the HRASTM.

#### 3.3.2.2 Site 8, Army Point Sludge Disposal Area

Site 8, the Army Point Sludge Disposal Area, was used for approximately 8 years, between 1968 and 1976, for disposal of sludge from the wastewater treatment plant (WWTP) on TI. Before

1968, the site contained buildings used as barracks for enlisted personnel. Waste sludge was transported from the WWTP and was spread on the ground between the foundations of former buildings at Site 8 to dewater the sludge. The final disposition of the sludge is not known; the dried sludge may have been allowed to decay in place or may have been removed. Given the shallow depth of sandstone and shale bedrock at the site, on-site burial is unlikely. Site 8 is located at the northeastern end of YBI and coincides with the eastern span of the Bay Bridge.

The Navy owned the property comprising the ramps and areas beneath the bridge until 2001, when the Federal Highway Administration (FHWA) transferred the bridge right-of-way and ramps from the Navy to the California Department of Transportation (Caltrans). Caltrans is now using this area for the new eastern span of the Bay Bridge. Two footings for the Bay Bridge were installed within the boundaries of Site 8.

The Navy finalized the interim RI report for Sites 8 and 29 in March 2009 (SulTech 2009b).

<u>**Current status:**</u> The Navy will discuss resuming work on the site with Caltrans after the old eastern span has been demolished, the freeway access ramps completed, and Caltrans has demobilized from staging/laydown areas.

# 3.3.2.3 Site 11, YBI Landfill

Site 11 is a former marsh area on the southern side of the eastern tip of YBI. This site was identified as a disposal area in a 1935 topographic map. The exact dates of sanctioned landfill operation have not been established. The types and amounts of waste disposed of at the site are not well documented. During a site visit in April 1994, buried concrete debris was observed in an eroded section of land near the beach at the easternmost extent of the landfill area. This buried debris is evidence that landfilling had occurred in that area. The material disposed of at the site is solid waste from operations at YBI and TI, although the exact nature of the material is unknown. Miscellaneous household waste was noted in test pits at the site (Barajas and Associates 2010).

The Navy finalized the interim RI report for Site 11 in January 2010 (Barajas and Associates 2010).

<u>**Current status:**</u> The Navy will discuss resuming work on the site with Caltrans after the old eastern span has been demolished, the freeway access ramps completed, and Caltrans has demobilized from staging/laydown areas.

# 3.3.2.4 Site 12, Old Bunker Area

Site 12, the Old Bunker Area and often referred to as the TI housing area, occupies about 93 acres in the northwestern portion of TI. From the early 1940s until about 1968, 21 ammunition bunkers were located in the Site 12 area. Disposal units and general solid waste disposal areas surrounded the bunkers. The Navy constructed four series of military housing

units at the site between 1966 and 1988. Excavations for building foundations identified debris (bottles, wire rope, paper, steel drums, and incinerator ash) from ground surface to 2 feet below msl. Grading and site preparation for construction of the housing units included mixing and spreading the solid waste material with fill and surface soil both within and outside the known SWDAs. The Navy leased portions of the housing area within Site 12 to TIDA in March 1999. Subsequently, TIDA subleased property, and the first residential tenants moved in during June 1999 (TriEco-Tt 2012).

In addition to the basewide actions and investigations, activities at Site 12 included:

- Exploratory Trenching and Sampling:
  - August 2000: Investigation and sampling in backyards at Buildings 1205 and 1211 found debris and samples indicated concentrations of lead, PCBs, and PAHs above screening criteria (SulTech 2006c).
  - October to November 2001: Trenches excavated at 175 locations found debris in varying quantities and depths between 2 and 4 feet bgs. Soil containing PCBs at concentrations exceeding screening levels was identified at three hotspot areas. About 800 cy of soil was removed and disposed of off site (IT Corporation 2002).
  - September to November 2003: Trenches excavated at 588 locations found debris, including burned material, in varying quantities and depths between 2 and 4 feet bgs. About 1,091 tons of soil was removed and disposed of off site (Shaw 2004b).

#### • Removal Actions:

- **June to August 1999:** About 2,200 cy of lead-contaminated soil and debris was excavated near Buildings 1207/1209 and disposed of off site (IT Corporation 1999).
- September to October 1999: About 3,100 cy of lead-contaminated soil and debris was excavated near Buildings 1231/1233 and 1133 and disposed of off site (IT Corporation 2000).
- July 2000: About 11,300 cy of PCB-contaminated soil was excavated near in the area of Halyburton and Bigelow Courts and disposed of off site (TriEco-Tt 2012).
- October to December 2001: About 1,314 tons of soil and debris was excavated near Buildings 1252, 1254, 1246, 1248, and 1413 and disposed of off site (IT Corporation 2002).
- **May 2007 and ongoing:** Non-time-critical removal action (NTCRA) to remove radiological and nonradiological chemicals in soil at SDWA Westside (formerly named A&B) (SulTech 2006c, 2007a). As reported in the 2013 post-construction summary report, a total of 8,000 cy of low-level radioactive waste (LLRW) and 5,526 cy of non LLRW had been transported off site for disposal at appropriate facilities. In addition, two shipments of radioactive commodities, such as buttons, deck markers, dials, and gauges containing radium-226, were transported off site for disposal (Shaw 2013a).

### • Soil Gas Investigations:

- **June 2000:** An investigation including sampling from 70 locations found VOCs in soil gas exceeded screening criteria at only one location near Building 1323 and methane at numerous locations.
- **May 2001:** Additional soil gas samples delineated the VOCs near Building 1323 and found methane to be closely correlated with natural gas pipelines.
- **January 2002:** Resampling after capping the natural gas pipelines found methane was not present at former locations, except near Buildings 1319 and 1321. Detections of 1,1,2,2-tetrachloroethane were observed near Building 1323 (Tetra Tech EM Inc. 2003).
- November 2008: Additional soil gas sampling at 95 locations found four locations that exceeded screening criteria. No soil gas plumes were identified (SulTech 2009c).

The Navy collected additional samples to supplement the RI in February 2013 and finalized a feasibility study (FS) for nonradioactive contaminants in areas outside of the SWDAs in March 2014 (CH2M Hill Kleinfelder Joint Venture [KCH] 2014). The FS identified effective technologies for treatment including excavation and off-site disposal for PCBs, PAHs, dioxins, lead, and chromium in soil and excavation of source areas, biostimulation, and monitored natural attenuation for TPH and arsenic in groundwater.

**Current status:** NTCRAs at SWDAs are ongoing. The Navy completed the NTCRA at Bigelow Court in October 2014 and is preparing the final status survey (FSS) and post-construction summary reports to document the work. Additional data gap sampling for CERCLA contaminants outside of the SWDAs was completed in October 2014 and the results will be used to support an FS addendum. In addition, radiological surveys of areas outside the SWDAs, including soil and housing structures, are complete and the Navy is preparing the summary documentation.

# 3.3.2.5 Site 24, Dry Cleaning Facility

Site 24 includes about 20 acres in the east-central portion of TI and contains Building 99, which was used as a laundry from 1942 to 1977 and as a dry cleaning facility for an unknown interval within that period. Waste solvents used during dry cleaning operations were discharged to soil and groundwater beneath the floor of Building 99 from leaks or spills. The volume of solvents that was released to the ground is unknown. Building 99 was later used for meat processing and as a print shop, and most recently as an office and workshop for film sets. Building 99 is located along 6<sup>th</sup> Street, between Avenues H and I, approximately 1,500 feet from the bay.

Former Sites 5 and 17 were incorporated into Site 24 for further investigation. Site 5 included Building 102, a boiler plant operated from 1943 through 1968, when it was demolished. Various chemicals may have been used during the boiler operations to prevent scaling. Site 17 contains the area surrounding ASTs 103 and 104. These diesel fuel ASTs were installed before 1943,

decommissioned in 1993, and emptied and cleaned in 1996, but have not yet been dismantled. Historical releases in the area have been documented, including application of waste oil, possibly containing PCBs, around the base of both ASTs for weed and dust control. This practice was discontinued when the area was paved after 1983.

In addition to the basewide actions and investigations, activities at Site 24 included a multiphase treatability study to investigate the plume of VOCs in groundwater emanating from Building 99 and an investigation of soil gas:

- May 2003 to March 2004: Pilot scale treatability study evaluated three in situ bioremediation techniques: (1) biostimulation with sodium lactate and hydrogen gas, (2) biostimulation with sodium lactate and bioaugmentation with a proprietary bacterial culture, and (3) biostimulation with sodium lactate. Techniques 1 and 2 indicated the best results.
- November 2004 to May 2007: Phase 1 treatability study. A total of 17 injection and 26 extraction wells were used to circulate 46,700 pounds of lactic acid, 658 cubic feet of hydrogen gas, and 13.7 million gallons of groundwater continuously for 3 months within the 7-acre plume core. During the injection of substrate, a total of 60 liters (L) of a proprietary bacterial culture was added to the plume core. The study also included installation of 104 biobarrier injection wells around the perimeter of the plume to control any potential migration from the injections in the plume core (Shaw 2008).
- June 2008 to October 2010: Phase 2 treatability study. The electron donor delivery and groundwater circulation system was reconfigured and expanded. The reconfiguration of the extraction and injection wells reversed the previous flow field and likely helped deliver electron donor to portions of the area where more treatment was required. In total, 1.4 million gallons of groundwater was circulated with approximately 8,370 pounds of sodium lactate and 216 pounds of vegetable oil and sodium lactate solution. These amounts roughly double the electron donor dose in this area compared with Phase 1. The groundwater recirculation system operated continuously for 5 months. This area was also bioaugmented with 20 L of proprietary bacterial culture during the electron donor injection and circulation (Shaw 2011c).
- November to December 2011: A preliminary soil gas investigation included installation and sampling of eight soil gas wells along the southern margin of Site 24 that is designated as an area for future residential development (TriEco-Tt 2014d).
- December 2011 to December 2012: Phase 3 treatability study. A total of 2.7 million gallons of groundwater was circulated with approximately 11,600 pounds of sodium lactate, 4,500 pounds of vegetable oil and sodium lactate solution, and 41 L of proprietary bacterial culture. The groundwater recirculation system operated continuously for 3 months (Shaw 2013b). Overall, the treatability study demonstrated that in situ bioremediation was effective at reducing VOC concentrations in groundwater throughout the site. Source material may still exist in an area at Building 99 that shows relatively less degradation and has been historically recalcitrant.

The Site 24 final RI and focused FS (FFS) was submitted in 2008 (SulTech 2008a). In December 2013, the Navy expanded the Site 24 boundary to encompass the entire VOC plume detected following the Phase I treatability study. The Navy prepared an FFS addendum (TriEco-Tt 2014d) for the site in October 2014 to address source area remediation and radiation issues. The Navy condensed the southern boundary of Site 24 in September 2014 to support CCSF in its redevelopment of areas adjacent to Site 24 (Navy 2014c).

<u>**Current status:**</u> The Navy is preparing the Proposed Plan/Draft RAP. Annual groundwater monitoring continues at Site 24.

### 3.3.2.6 Site 29, East Side On/Off Ramps

Site 29 is located below and parallel to the Bay Bridge from the northeastern portion of YBI westward to the YBI tunnel, with a portion of the site on the western side of the YBI tunnel. The western and central portions of the site are mostly covered by pavement or concrete associated with the bridge and the on- and off-ramps. The Navy owned the property comprising the area beneath the bridge until 2001, when the FHWA transferred the bridge right-of-way from the Navy to Caltrans.

The Navy finalized the interim RI report for Sites 8 and 29 in March 2009 (SulTech 2009b).

<u>**Current status:**</u> The Navy will discuss resuming work on the site with Caltrans after the old eastern span has been demolished, the freeway access ramps completed, and Caltrans has demobilized from staging/laydown areas.

#### 3.3.2.7 Site 32, Former Training and Storage Area

Site 32 is located in the northeastern corner of TI, east of the WWTP on Avenue M. The site includes Building 462 and the area of former Building 463. The area has been used as a parking area for vehicles and forklifts, a storage area for hazardous materials and hazardous wastes, a tear gas training area, and as storage for former training facilities. A concrete pad, located north of Building 463, formerly held an electrical transformer. Historically, the site also contained the U.S.S. Pandemonium, which was used for radiological decontamination training. The mock training ship was placed on land on top of a 9-inch-thick concrete pad at the northern portion of Site 32. The Navy demolished the U.S.S. Pandemonium superstructure in 1996. The Site 32 area was designated for investigation because fluid that contained PCBs was known to have been released from the former transformer and to assess the possibility of contamination associated with historical site usage.

In addition to the basewide actions, activities at Site 32 included:

- November 2005: A series of exploratory trenches were excavated to identify the extent of burned material and dioxins in site soil (Shaw 2006).
- October 2008: Final RI report completed (SulTech 2008b).

- June to September 2009: About 13,490 tons of contaminated soil was excavated and disposed of off site to remove PCBs in soil at concentrations exceeding 1 part per million, which is the level considered safe for residential use under the Toxic Substances Control Act, and to remove other chemicals including pesticides, dioxins, TPH, and metals (Shaw 2011b).
- February 2011 to February 2012: Groundwater monitoring for TPH and metals for four quarterly events indicated either no detections or only low levels of chemicals. No further action was recommended for groundwater (Shaw 2012b).
- **September 2011:** Final proposed plan recommending no further action (Navy 2011c).

<u>**Current status:**</u> The Navy conducted a radiological survey of the former U.S.S. Pandemonium Site II mockup location and is preparing a summary report of the investigation findings. The Navy will prepare a ROD/RAP after the survey is complete.

### 3.3.3 Sites Where a Five-Year Review Is Not Needed

This subsection describes sites that are closed and where a five-year review is not necessary because no hazardous substances remain on site above levels that allow for unlimited use and unrestricted exposure. The following 12 sites are discussed below: 1, 2, 3, 7, 9, 10, 13, 18, 23, 28, 31, and 33.

#### 3.3.3.1 Site 1, Medical Clinic

Site 1, the Medical Clinic, is located near the middle of TI and was used for medical support services for personnel at NAVSTA TI. The former clinic was located in the center wing of Building 257 on 9<sup>th</sup> Street east of Avenue E. The wooden floor of the building is elevated about 3 feet above ground by concrete footings. A continuous concrete mat foundation exists below the building, covered by 3 to 12 inches of soil. Film processing operations in the X-ray department of the clinic released developer and fixer solutions containing silver through the floor and into the soil located above the concrete mat foundation. The extent of contamination was delineated in 1995 (Tetra Tech EM Inc. 2001b) and about 0.5 cy of soil was removed and disposed of off site. The concrete slab beneath the removed soil showed no staining, cracking, or other evidence of deterioration. The Navy received site closure concurrence from DTSC in 2002 (DTSC 2002a).

#### 3.3.3.2 Site 2, Radiation Training Area

Site 2, the Radiation Training Area, was located near the intersection of 12<sup>th</sup> Street and Gateview Avenue on the northwestern side of TI. This area is also collocated with Site 12 (see Section 3.3.2.4). The site contained the U.S.S. Pandemonium ship mockup, which was used for radiological decontamination training. Operations in this area began in the early 1950s and ceased in 1969 when the school moved to Site 32. Radiation sources were identified as potential

contaminants from the radioactive water generated during training. The 1987 PA/SI (Dames and Moore 1988) recommended this site not be carried forward in an RI, and the historical radiological assessment (HRA) designated the area (called U.S.S. Pandemonium Training Site Northwest Corner) as non-impacted (Weston 2006). However, the area is now considered radiologically impacted based on a more conservative estimate of the potential for contamination to have resulted from unlicensed instrument check sources or failure to comply with procedures (TriEco-Tt 2014a). Site 2 is being addressed as part of the Site 12 radiologically impacted.

#### 3.3.3.3 Site 3, PCB Equipment Storage Area

Site 3, the PCB Equipment Storage Area, is adjacent to the south side of Building 3, about 150 feet from the shoreline in the southeastern corner of TI. The area is paved with about 6 inches of asphalt and was used to store and, in some instances, repair transformers used at NAVSTA TI to supply electricity to the various facilities. Some of the transformer units are known to have held transformer fluids that contained PCBs. Transformer fluids that contained PCBs have spilled as recently as the mid-1980s, and although they were reportedly cleaned up, no records of the cleanup are available. Only low concentrations of PCBs were detected during wipe sampling of the walls and floor of the storage area during the 1987 PA/SI (Dames and Moore 1988). No PCBs were present in subsurface soils collected beneath the wipe sample locations during the Phase I RI in 1992 (PRC 1997). The Navy received site closure concurrence from DTSC in 2002 (DTSC 2002b).

# 3.3.3.4 Site 7, Pesticide Storage Area

Site 7 is located north of 13<sup>th</sup> Street, between Avenue M and the bay, in the northeast corner of TI. Building 62, the pesticide storage building, has been used to store and handle a variety of liquid substances in the past, including pesticides, chlorinated herbicides, paint, and other unidentified fluids. Building 62 was constructed on a raised pier foundation, with the wooden floor of the building approximately 3 feet above ground surface. The pesticide storage area was on a raised wood floor in the north end of the building. Pesticides and chlorinated herbicides were mixed and prepared for use from about 1955 until at least the early 1960s. It was reported that excess pesticide and paint fluids may have been disposed of by pouring them directly onto the ground. Sludge from the adjacent WWTP was also spread on the ground southwest of Building 62 between 1968 and 1976.

The Navy conducted three investigations of soil and groundwater at Site 7: (1) Phase I RI in 1992, (2) Phase IIB RI in 1995, and (3) supplemental site inspection in 2002. The Navy concluded that the low concentrations of pesticides detected in soil, which were not contiguous, did not indicate a spill or release, but instead appeared to be associated with application of pesticides during construction or subsequent routine application of pesticides at the site. Groundwater samples collected in 1995 did not indicate detections of any chemicals above laboratory detection limits (Navy 2005b). The Navy received site closure concurrence from DTSC in 2005 (DTSC 2005).
#### 3.3.3.5 Site 9, Foundry

Site 9 is adjacent to the southern corner of Building 3, about 150 feet from the shoreline, in the southeastern corner of TI. The site, which contains Building 41 (the Foundry), has been used for multiple operations since the early 1940s. The indices of TI buildings from 1943 and 1947 list Building 41 as a forge and foundry; metals are the most likely contaminant sources from the foundry. Building 41 was listed as a paint shop from at least 1952 to 1981. One floor drain and sump, representing a possible discharge point, was observed next to the paint booth when Building 41 was inspected during the Phase I RI. Paints used at this facility are known to have contained lead- and zinc/chromium-based pigments. In addition, two concrete trenches, apparently remaining from a hydraulic lifting system, are present in the large middle room and are evidence that vehicle maintenance may have been performed there. A 30-gallon storage tank, presumably used to contain hydraulic oil for use with the hydraulic lift, is located in a concrete-lined pit at the eastern end of one trench. From 1981 to 1987, the building was used as a welding training school by the Navy Technical Training Center. In 1994, the building was used for small-boat maintenance, primarily body work.

Environmental data collected between June 1992 and November 2002 were used to delineate the extent of contamination in soil and groundwater at Site 9. The final RI report (SulTech 2005a) presented the geologic, hydrogeologic, and chemical data collected during Phase I, Phase IIA, and Phase IIB of the RI, quarterly groundwater sampling, the EBS, and additional RI field efforts conducted under the Navy IR Program during fall 2002. No major sources of organic or inorganic contamination were identified in soil or groundwater at Site 9.

Based on the information and data evaluated as part of the RI for Site 9, soil and groundwater do not pose unacceptable human health or ecological risks. Therefore, the Navy concluded that no CERCLA action was necessary to protect human health or the environment. A no-action ROD for Sites 9 and 10 was signed October 2, 2007 (Navy 2007).

#### 3.3.3.6 Site 10, Bus Painting Shop

Site 10 includes Building 335, the Bus Painting Shop, and is located in the northeastern section of TI, north of 13<sup>th</sup> Street and between Avenue N and the bay. Building 335 was constructed during the mid-1940s and operated as a bus painting shop through the 1950s. The building may have also been used for paint mixing for an unspecified period. Handling practices reported at similar facilities on NAVSTA TI indicate that waste paints, thinners, and solvents may have been released onto the ground near Building 335. Building 335 was also reportedly used for storing, mixing, and handling pest control solutions (pesticides and chlorinated herbicides) during an unspecified time period. Residues from pest control solutions were reportedly washed from containers and spraying equipment. It was also reported that Building 335 housed a self-service steam rack used to clean vehicles, drums, garbage cans, and related equipment. A floor drain was reportedly used in the building and was connected to the storm water sewer system, thus potentially conveying contaminants directly into the bay. An inspection of the building in March 1994 revealed a cement-patched area that may have been the former location of the floor drain.

Environmental data collected between June 1992 and November 2002 were used to delineate the extent of contamination in soil and groundwater at Site 10. The final RI report (SulTech 2005a) presented the geologic, hydrogeologic, and chemical data collected during Phase I, Phase IIA, and Phase IIB of the RI, quarterly groundwater sampling, the EBS, and additional RI field efforts conducted under the Navy IR Program during fall 2002. In addition, activities related to trenching and confirmation soil sampling for dioxins were summarized in a final technical memorandum (Shaw 2006). No major sources of organic or inorganic contamination were identified in soil or groundwater at Site 10.

Based on the information and data evaluated as part of the RI for Site 10, soil and groundwater do not pose unacceptable human health or ecological risks. Therefore, the Navy concluded that no CERCLA action was necessary to protect human health or the environment. A no-action ROD for Sites 9 and 10 was signed October 2, 2007 (Navy 2007).

#### 3.3.3.7 Site 13, Storm Water Outfalls / Offshore Sediments

Site 13 includes 520 acres of offshore areas around the perimeter of NAVSTA TI and Clipper Cove. It excludes Site 27, the former skeet range located in the Clipper Cove, and a submerged parcel that has been reassigned to the U.S. Coast Guard. In 1992, the Navy collected data to assess whether chemicals were moving off shore via the storm water outfalls. Based on the results of this storm water investigation, the Navy concluded that chemicals may have been released to the offshore areas and that further investigation of Site 13 was warranted. A second investigation was therefore conducted in 1996 to further characterize the sources, extent, and potential toxicity of chemical contamination in the offshore sediments. The results of these two offshore investigations indicated that metals, PCBs, PAHs, dichlorodiphenyltrichloroethane (DDT), and other organic compounds were the chemicals most frequently detected in the sediment samples (Tetra Tech EM Inc. 2001d).

In 2001 and 2002, two additional investigations were conducted of the sediments adjacent to possible onshore source areas at Sites 11 and 12, where burned solid waste or PCB-contaminated material may have been deposited. Concentrations of metals, PCBs, and TPH in the offshore sediments were not found to be elevated. These studies indicated that no additional investigation was needed. Results of the four offshore sediment investigations were used to conduct an ecological risk assessment, which concluded the offshore sediments at Site 13 do not pose an unacceptable risk to the environment. An evaluation of potential risk to human health likewise concluded that no complete exposure pathways existed. Therefore, the Navy concluded that no CERCLA action was necessary to protect human health or the environment. A no-action ROD for Site 13 was signed April 7, 2005 (Navy 2005a).

#### 3.3.3.8 Site 18, Possible Asbestos-Containing Material on YBI

Site 18 was identified during the PA/SI based on a report that a landslide on YBI in the early 1980s had exposed abandoned steam piping insulated with asbestos. The PA/SI reported that no other information was found to confirm the report, nor were plans located that suggested the presence of steam lines. The PA/SI recommended no further studies to verify the existence of

the lines or the presence of asbestos, noting that any asbestos is currently buried with the lines and is, therefore, contained (Dames and Moore 1988). Site 18 has been considered closed under the CERCLA process since the PA/SI.

#### 3.3.3.9 Site 23, YBI Fuel Line Rupture / Landslide

Site 23 was identified during the PA/SI based on a report that a landslide on YBI in the early 1980s had ruptured a pipeline on YBI and released "black oil." The line carried the product from the refueling pier uphill to a storage tank located on the top of YBI. The volume of product released was unknown; however, the capacity of the line between the refueling pier and the tank was on the order of 400 gallons. The areal distribution of product was presumed to be large and the resultant concentration of released product to be small based on the steep local topography and the mechanism of landslide movement. The PA/SI recommended no further studies for the site. Site 23 has been considered closed under the CERCLA process since the PA/SI.

## 3.3.3.10 Site 28, West Side On/Off Ramps

Site 28 includes about 10.5 acres on the southwestern portion of YBI. Site 28 is bounded to the west by the bay; to the east by Treasure Island Road, which is within the boundaries of Site 28; and to the southeast by Site 29. Other than the roads running through Site 28, most of the site is steeply sloped to the southwest toward the bay and densely vegetated with trees and brush. The on/off ramps were likely constructed at the same time as the San Francisco–Oakland Bay Bridge in 1936. There is no documentation of Navy-specific activities at Site 28, other than routine repairs, maintenance, and reinforcements of the roadway and ramp structures. The Navy owned the property comprising the ramps and the area beneath the bridge until 2001, when the FHWA transferred the bridge right-of-way and ramps from the Navy to Caltrans. The surface soil on the site may be contaminated by lead and other metals as a result of vehicle emissions, as well as bridge and ramp painting and maintenance.

Site 28 was added as an IR site in 1993 based on metal impacts to soil identified during an investigation related to health and safety concerns for workers performing seismic improvements to the on/off ramps in areas possibly containing elevated concentrations of metals in airborne dust (Blaine Technical Services, Inc. 1993). Additional samples were collected during the Phase IIB RI to delineate the extent of metals, especially lead, in soil at Site 28 (PRC 1997). The HHRA indicated no unacceptable risks to future receptors, except potential child residents. However, all of Site 28 is proposed for inclusion in the Tidelands Trust and residential, industrial, and non-maritime land uses are generally prohibited.

The Navy evaluated ecological risk at Site 28 as part of a validation study. The study concluded that Sites 8, 11, 28, and 29 posed minimal risk to the peregrine falcon and no further ecological investigations were recommended (Tetra Tech EM Inc. 2001c).

Therefore, the Navy concluded that no CERCLA action was necessary to protect human health or the environment. A no-action ROD for Site 28 was signed November 22, 2010 (Alliance Compliance Group Joint Venture 2010).

#### 3.3.3.11 Site 31, Former South Storage Yard

Site 31, the asphalt-covered playground south of the Treasure Island Elementary School, referred to as the Former South Storage Yard, is located north of the corner of Avenue D and 11<sup>th</sup> Street. Site 31 is adjacent to and north of Site 30. According to historical aerial photographs, Site 31 was used during the late 1960s and early 1970s as a storage yard; however, the nature of, and operations at, the storage yard are unknown. In the late 1970s, the area was paved over and developed as a playground for the elementary school. Based on a FOSL and the restrictions identified in that report, the Navy entered into a lease agreement with the San Francisco Unified School District (SFUSD) on May 13, 1996, for the elementary school and associated playground. The school had originally been constructed by SFUSD around 1968 when the military housing was built and was operated under a previous agreement with the Navy until the 1996 lease agreement.

In 2002, the Navy investigated the area because of its former use as a storage yard and because of the reference to an "old trash dump" noted on a 1989 as-built drawing for the 11<sup>th</sup> Street water line replacement project. Site 31 was added to the CERCLA cleanup program in 2003.

In addition to the basewide actions, activities at Site 31 included:

- **February to April 2002:** An initial investigation including 44 direct-push soil borings identified debris and PCBs, lead, and DDT at concentrations exceeding site soil screening levels (Shaw 2003).
- May to August 2002: A series of exploratory trenches identified various types of wastes, including burned debris that contained copper and lead at levels exceeding the site soil screening levels (Shaw 2003).
- July 2002: A TCRA removed about 450 cy of soil and debris from the south side of Site 31, north of 11<sup>th</sup> Street.
- August to September 2003: Additional characterization of soil and debris using trenching and direct-push borings identified concentrations of PAHs, dioxins, TPH, and metals at concentrations exceeding site soil screening levels (Shaw 2004a).
- May 2004: Six groundwater monitoring wells were installed and sampled for analysis of VOCs, SVOCs (including pesticides, PCBs, and dioxins), TPH, and metals. No chemicals were detected at concentrations exceeding groundwater screening criteria (Shaw 2004a).

The Navy finalized the ROD/RAP for Site 31 in August 2009 (Barajas and Associates 2009b). The selected remedy was chosen to allow unrestricted use of the site after the cleanup and consists of the following components:

• Complete excavation of contaminated soil and debris from five locations, disposal off site, and backfill with clean material.

Excavation of soil and debris from four areas (Areas A, B, C, and E) began in February 2010 and was completed in March 2010. A total of approximately 5,843 cy was removed from these four areas and stockpiled on site. Excavation of soil and debris from a fifth location (Area D) began in April 2010 and was suspended later that month when initial overexcavation indicated that the extent of stained soil and burned debris was much greater than planned. About 1,190 cy was removed and stockpiled on site, and the open excavation and stockpiles were secured with fencing (Shaw 2012a).

In June 2010, a radiological survey of a sidewall of the open excavation identified elevated count rates and a soil sample from the sidewall indicated a maximum concentration of radium-226 of 10.8 picoCuries per gram, which exceeded the cleanup level for radium-226. Excavation paused for preparation of radiological protocols for the area (Shaw 2012a).

Activities at Site 31 resumed in February 2012 with radiological screening of the previously excavated material. Overexcavation at two locations within Area D was completed in July and August 2012; about 925 cy was removed and screened for radionuclides on site. None of the excavated, screened soil exceeded the cleanup goal for radium-226. Confirmation samples indicated no soil containing lead, benzo(a)pyrene equivalents, dioxins, or radium-226 remained at levels exceeding cleanup levels. The excavated material was disposed of off site in November and December 2013, and the excavations were backfilled with clean material. A remedial action completion report (RACR) and FSS report summarizing the cleanup are in preparation (Gilbane forthcoming).

#### 3.3.3.12 Site 33, Water Line Replacement Area

Site 33, the Water Line Replacement Area, is located south of Site 24 at the intersection of Avenue I and 4<sup>th</sup> Street. The majority of Site 33 is covered by a grassy area at the location of former Building 92 (demolished), Buildings 40 and 107, and a large undeveloped grassy area located in the southwestern corner of the site. Historical uses of these buildings included general uses such as barracks, classrooms, and offices, as well as more specific uses such as a hospital (Building 92), electronics laboratory (Building 40), and police station (Building 107).

The area was identified in 2002 based on review of historical as-built drawings, which showed locations where crews observed debris in the trench for a water line during extensive repairs in the 1980s (Shaw 2005). In addition, areas of debris were identified near Building 530, south of Site 33, during removal of a fuel pipeline (Shaw 2003). Most of the areas of debris are within the footprint of the former Lake of the Nations, constructed for the Golden Gate International Exposition of 1939 and 1940. Site 33 was added to the CERCLA cleanup program in 2006.

In addition to the basewide actions, activities at Site 33 included:

• April to September 2003: A series of exploratory trenches identified various types of wastes, including burned debris that contained dioxins and metals at levels exceeding the site soil screening levels (Shaw 2005).

• July to August 2005: Four groundwater monitoring wells were installed and sampled and three other existing wells on Site 33 were sampled during the RI to evaluate chemicals in groundwater. Results indicated concentrations of dioxins and silver exceeding groundwater screening criteria (Tetra Tech EM Inc. 2010a); however, the only potential exposure to groundwater is to construction workers via dermal contact in a trench. The HHRA in the RI identified no unacceptable risks under this scenario.

The explanation of significant differences (ESD) that added Site 33 to the ROD/Final RAP for Site 31 was finalized in May 2011 (Navy 2011a). The selected remedy for Site 33 was chosen to allow unrestricted use of the site after the cleanup and consists of the following components:

• Complete excavation of contaminated soil and debris from five locations, disposal off site, and backfill with clean material.

Excavation of soil and debris from five areas (Areas 1 through 5) began and was completed in May 2012. A total of approximately 520 tons of soil was removed from these five areas and screened for radionuclides on site (Shaw 2012c). Confirmation samples indicated no soil containing lead remained at levels exceeding cleanup levels. Radiological contaminants were screened for but were not identified at the site. The excavated material was disposed of off site in November 2013, and the excavations were backfilled with clean material. A RACR was finalized to summarize the cleanup and recommendation for no further action (Gilbane 2014). The regulatory agencies concurred with the report and recommendation on October 29, 2014 by signing the final RACR.

## 4.0 **REMEDIAL ACTIONS**

This section discusses the initial plans, implementation history, status of the remedies, and relevant site activities since the ROD/Final RAPs were signed to the present. Remedy selection, remedy implementation, remedy performance, and any changes to or problems with the components of the remedy are discussed, by site, below.

# 4.1 SITE 21, VESSEL WASTE OIL RECOVERY AREA

# 4.1.1 Remedial Action Objectives for Site 21

The ROD/RAP for Site 21 was finalized in February 2013 (Navy 2013a). The treatability study successfully treated VOCs in groundwater at Site 21, including the source area. However, the treatability study caused fluctuations in VOC concentrations in groundwater as degradation of VOCs was occurring. Therefore, the Navy chose to develop remedial action objectives (RAO) and remediation goals for future commercial/industrial workers and future construction workers to address the degradation products produced during the treatability study. The Navy developed the following RAOs to address exposure of future commercial/industrial and future construction workers to post-treatability study VOC concentrations:

- Prevent exposure of future commercial/industrial workers through inhalation of VOCs in groundwater that migrate through the subsurface to indoor air (vapor intrusion) from groundwater that contains VOCs at concentrations above remedial goals.
- Prevent exposure of future construction workers through dermal contact with and inhalation of VOCs in groundwater that contains VOCs at concentrations above remedial goals in a construction trench.

#### 4.1.2 Selected Remedy for Site 21

The selected remedy for Site 21, as presented in the Site 21 ROD/Final RAP, includes land use controls (LUC) in the form of ICs and land use restrictions and includes the following components:

- A deed notice will be recorded to notify the public about the existence of potential contamination at Site 21.
- The deed for transfer of the property will require the property owner to provide a notification to future users of the southeast corner of Building 3, within the Site 21 boundary (Figure 3), where the risk estimates calculated in the HHRA addendum slightly exceed regulatory criteria for commercial/industrial occupants if this area, which is not currently enclosed, is fully enclosed at some point in the future. The notification shall describe the screening-level health risk estimates associated with the COCs remaining at the site. The deed will also require the property owner to notify DTSC of improvements in this area that result in the area being fully enclosed. The notification requirement shall be removed when it is demonstrated that the residual soil gas concentrations are below the site-specific screening levels (SSSL) for commercial/industrial use.
- A deed restriction will be recorded to (1) prohibit all uses of groundwater beneath Site 21, including groundwater extraction, except for dewatering purposes (extracted groundwater must be handled in accordance with all laws and as described in a soil disturbance site management plan [SMP]); (2) require evaluation and potential installation of engineering controls if new non-commercial buildings are constructed or the current land use of existing buildings changes; and (3) prohibit residential use, unless appropriate engineering controls are implemented that are protective of residential receptors. Prior to residential development, a vapor intrusion assessment must be conducted to determine if engineering controls are required to support residential use within the area requiring ICs (Figure 3). If the results lead to a determination that controls are not required, land use may include residential, as well as commercial/industrial use, without the installation of engineering controls.

- A land use control remedial design (LUC RD) report will be developed to specify the IC implementation actions and the roles and responsibilities for implementing, monitoring, and enforcing the ICs. The LUC RD would include: (1) the duration of the ICs; (2) the mechanisms that would be used to implement ICs and achieve the IC objectives; and (3) implementation actions necessary to ensure that the ICs and IC objectives are met, including inspecting, monitoring, reporting and enforcing the ICs. (The LUC RD has been prepared [Navy 2013c], as described in the next section and Section 7.1.1.3.)
- Soil gas and groundwater monitoring will be conducted to confirm that the human health risk from the vapor intrusion pathway remains in the acceptable range. Soil gas and groundwater samples will be collected from existing soil gas and groundwater monitoring wells until the next five-year review. Results will be evaluated and compared to the soil gas SSSLs and groundwater remedial goals to determine if the vapor intrusion pathway risk remains stable and within or below the risk management range for non-residential users. The vapor intrusion pathway risk will be considered stable if COC concentrations do not show long-term increasing trends. The soil gas and groundwater monitoring network and analyses will be designed, with input from regulatory agencies, as part of the NAVSTA TI base-wide monitoring activities. (The Navy has collected soil gas and groundwater samples to evaluate the vapor intrusion pathway. Refer to Section 7.1.1.1 for details of the sampling and evaluation.)
- A soil disturbance SMP will be developed that will specify the characterization, handling, and disposal requirements in the event that contaminated media are encountered during site redevelopment or maintenance activities. The soil disturbance SMP will be enforced through the deed restriction.
- Five-year reviews and reporting will be conducted to ensure the continued effectiveness of the ICs.

## 4.1.3 Remedy Implementation and Long-Term Monitoring at Site 21

Land Use Control Implementation: The Navy finalized the LUC RD report in October 2013 (Navy 2013c). The Navy conducted a LUC inspection at Site 21 in March 2014 (TriEco-Tt 2014b). The site inspection involved a visual assessment of the overall site and soil gas and groundwater monitoring wells to confirm continued compliance with all IC objectives and land use restrictions. No activities inconsistent with the IC objectives or use restrictions were observed. Deed restrictions, including the soil disturbance SMP, will be prepared and applied during the property transfer process.

**Groundwater and Soil Gas Monitoring:** In December 2013, the Site 21 monitoring program was revised to include groundwater monitoring of three site groundwater wells and five soil gas wells at Site 21. These wells were selected for further monitoring based on concentrations of COCs that have been previously reported above remedial goals for groundwater or above the soil gas SSSLs. Groundwater and soil gas samples were collected in December 2013 and April 2014.

The three groundwater monitoring wells (21-MW02A, 21-MW09A, and 21-IP07) were designated for continued monitoring (see Figure 3). Well 21-IP07 was chosen because it was the only monitoring well with concentrations of COCs, specifically cis-1,2-dichloroethene (DCE) and vinyl chloride, above the remedial goals at the time that the ROD/Final RAP was signed. Data were collected from nearby wells 21-MW02A and 21-MW09A to confirm that the elevated VOC concentrations remained localized at the single location.

Five soil gas probes (21-SG-04, 21-SG-05, 21-SG-27, 21-SG-30, and 21-SG-31, see Figure 3) were designated for continued monitoring. Soil gas probe 21-SG-27 was chosen because, at the time that the ROD/Final RAP was signed, it was the only location with a calculated hazard index greater than 1 for commercial and industrial users, which slightly exceeded the regulatory criteria. All other soil gas probe locations had calculated human health cancer risks below 10<sup>-5</sup> and hazard indices below 1 for commercial and industrial receptors (Shaw 2012d). Soil gas probes 21-SG-30 and 21-SG-31 were selected, in addition to 21-SG-27, because they are also located within the footprint of existing Building 3 and can provide the most relevant data regarding potential commercial/industrial exposure. Two subsurface soil gas probes outside of Building 3 (21-SG-04 and 21-SG-05) were selected to monitor potential risk to receptors in future hypothetical buildings. These soil gas probes are located closest to groundwater monitoring well 21-IP07.

Refer to Section 7.1.1 for a more detailed discussion of trends in groundwater and soil gas data.

# 4.2 SITE 27, CLIPPER COVE SKEET RANGE

## 4.2.1 Remedial Action Objectives for Site 27

The ROD/RAP for Site 27 was finalized in March 2012 (Navy 2012). The RAOs for Site 27 identified in the ROD/Final RAP are:

- Prevent or minimize ingestion of lead shot by diving ducks within 75 feet of the shoreline, where there is a complete exposure pathway under current conditions.
- Prevent or minimize ingestion of lead shot by diving ducks site-wide, where there is a potentially complete exposure pathway for diving ducks under future conditions where lead shot is currently buried below at least 2 feet of sediment.

## 4.2.2 Selected Remedy for Site 27

The selected remedy for Site 27, as presented in the Site 27 ROD/Final RAP, consists of the following components:

• Conduct focused dredging to remove sediment located within 75 feet from the shoreline to a depth of 1.5 feet. (The design dredge depth was revised from 2.5 feet listed in the ROD/Final RAP based on a bathymetric survey completed for the RD. This minor change to the remedy was recorded in a memorandum to the

administrative record file [Navy 2013b].) Backfill the dredged area with cover material to protect it from marina use and associated activity. Transport dredged material by barge to an upland beneficial reuse site. Conduct confirmation bathymetric surveys after completion of the remedial action, 1 year after completion, 5 years after completion, and at successive 5-year intervals.

• Implement ICs to restrict disturbance of the remaining sediment, which will prevent or minimize re-suspension of lead shot from deeper sediments in the undredged portion of the site. ICs may include restrictions on vessel speed, controls on dredging within the boundary of Site 27, and long-term monitoring of the backfill. Legal instruments known as restrictive covenants in Quitclaim Deed(s) between the Navy and the property recipient and in "Covenant(s) to Restrict Use of Property" between the Navy and DTSC will be implemented at the time of transfer of the property to establish land use and activity restrictions to limit exposure to contaminated sediment to achieve IC performance objectives.

#### 4.2.3 Remedy Implementation and Long-Term Monitoring at Site 27

Focused dredging of sediment and backfilling (filter layer and rock armor layer) at Site 27 began in July 2013 and was completed in November 2013 (Figure 4). Approximately 8,677 cy of

sediment was removed. Bathymetric surveys conducted dredging after backfilling after and indicated specifications for thickness of sediment removed and thickness of the backfill installed (TriEco-Tt 2013a) were met. Dredged sediment was transferred by barge from TI to Alameda Point, where the sediment was dried and profiled for chemical content. The Navy authorized collection of an additional 20 waste characterization samples of the sediment after the sediment had been transferred to the dewatering pad at Alameda Point. Those data confirmed that most of the material was suitable for beneficial reuse at Alameda Point. Of 20 stockpiles, 17 were suitable for use as subgrade material for the Site 1 landfill at Alameda Point and three were disposed of off site as hazardous waste based on their lead content. As described in the RACR (Tetra Tech EC, Inc. 2014), a total of approximately 10,070 tons was reused as subgrade material at Site 1 at Alameda Point



and 1,208 tons was disposed of off site. The first post-remediation bathymetric survey was planned for 1 year after remediation was complete; this survey was completed in November 2014. The LUC RD (Tetra Tech EM Inc. 2013) summarizes the ICs related to protection of the integrity of the rock armor layer. An addendum to the LUC RD is planned to be prepared to address other aspects of the ICs at Site 27 to protect the remedy, which may include signage, limits on vessel speed, and restrictions on dredging within the boundary of Site 27. A draft addendum was prepared in November 2014 (Multimedia Environmental Compliance Group [MMEC] 2014).

## 4.3 SITE 30, DAYCARE CENTER

## 4.3.1 Remedial Action Objectives for Site 30

The ROD/RAP for Site 30 was finalized in August 2009 (Barajas and Associates, Inc. 2009a). The RAOs for Site 30 identified in the ROD/Final RAP are:

- Protect potential future commercial/industrial and potential future residential receptors by preventing the ingestion and direct contact with soils containing dioxin toxic equivalents (TEQ) above the previously established ambient dioxin TEQ of 12 nanograms per kilogram (ng/kg) beneath and adjacent to Building 502.
- Protect the current daycare center receptor by preventing the ingestion of and direct contact with soils containing unknown concentrations above the previously established ambient dioxin TEQ of 12 ng/kg beneath Building 502.

#### 4.3.2 Selected Remedy for Site 30

The selected remedy for Site 30, as presented in the Site 30 ROD/Final RAP, consists of the following components:

- Engineering controls to maintain the building foundation slab to prevent contact with potential dioxin contamination beneath the slab. The existing slab of the daycare center building would be maintained as an exposure prevention barrier. The existing slab is not likely to require maintenance to continue serving as an exposure prevention barrier; however, periodic inspections would be required to verify its integrity. The Site 30 Concrete Pad adjacent to Building 502 would not be maintained as an engineering control because contaminants beneath the pad do not pose a risk to current use of the site as a daycare center.
- ICs to address risk from soil beneath the Site 30 Concrete Pad to potential future users. ICs will restrict any removal or penetration of the Building 502 slab, except when specific guidelines have been followed to prevent exposure to potentially contaminated soil. If utility repairs (such as water or sewer repairs) are required, measures would be implemented to prevent exposure of the occupants and workers to potentially contaminated soil. The ICs would require inspection, maintenance, and reporting of the Site 30 Concrete Pad and Building 502 building slab to ensure remedy compliance.

#### 4.3.3 Remedy Implementation and Long-Term Monitoring at Site 30

Figure 5 shows Building 502 and the Site 30 Concrete Pad adjacent to the west. The Navy finalized the LUC RD report in November 2010 (Trevet 2010b). The Navy conducted annual LUC inspections at Site 30 starting in 2011 (Trevet 2011, 2012, 2013a; TriEco-Tt 2014c). The site inspection involved a visual assessment of the interior and exterior of Building 502 and the

associated exterior concrete pad to evaluate whether the building's slab continued to serve as an effective barrier to potential subsurface contamination. No violations of the LUCs were identified during any of the site inspections.

## 5.0 PROGRESS SINCE LAST FIVE-YEAR REVIEW

This is the first five-year review for NAVSTA TI.

## 6.0 FIVE-YEAR REVIEW PROCESS

This section describes activities during the five-year review process for NAVSTA TI and provides a summary of each step in the process.

#### 6.1 ADMINISTRATIVE COMPONENTS

The five-year review process was initiated in April 2014. The process consisted of:

- Community notification and involvement
- Document review
- Data review
- Site inspection
- Five-year review report preparation
- Interviews with key personnel

Members of the BRAC Cleanup Team (BCT) were notified of the initiation of the five-year review during a meeting on May 21, 2014.

#### 6.2 COMMUNITY NOTIFICATION AND INVOLVEMENT

Community involvement was initiated by announcements of the five-year review process at a community meeting held on June 25, 2014. Community members were interviewed on June 19 and 25, 2014, as part of the five-year review process. Appendix A contains summaries of the interviews. A public notice was published in the *San Francisco Examiner* on October 12, 2014 announcing the five-year review process and the availability of the draft five-year review report for public comment. The draft five-year review report was made available to the public at the two information repositories: the San Francisco Main Public Library (at 100 Larkin Street), and the Navy offices on TI at 1 Avenue of the Palms, Room 161. Comments were received from DTSC and one public member of the Restoration Advisory Board; Appendix B contains responses to these comments. The final five-year review report was placed in the two information repositories. A public notice announcing the completion of the five-year review and

the availability of the final report will be published in the *San Francisco Examiner* within 2 weeks of the date of the final report. A fact sheet summarizing the results of the five-year review will be distributed to the public within 2 months of the date of the final report.

## 6.3 DOCUMENT REVIEW

This five-year review included a review of relevant documents listed in Appendix C. The general review process began with a review of the ROD/Final RAP for each site to identify potential risks to human health and the environment, RAOs, selected remedy, applicable or relevant and appropriate requirements (ARAR), and remediation goals. The RD, or similar document, was then reviewed to evaluate the design components for the remedy, monitoring requirements, and LUC boundaries. RACRs and monitoring reports were reviewed to assess remedy performance and continued protection of human health and the environment.

## 6.4 SITE INSPECTION

The Navy conducted a site inspection for this review on June 19, 2014. Staff from DTSC and the Water Board attended the inspection, in addition to staff from the Navy and Navy contractor TriEco-Tt. The purpose of the site inspection was to review and document current site conditions and evaluate visual evidence on the protectiveness of the remedial systems. Site access and general site conditions were also evaluated during the inspection. Appendix D contains the site inspection checklist, and Appendix E contains the photographic log, which documents observations made during the inspection. The site inspection focused on Sites 21, 27, and 30. Sites 31 and 33 were also visited, though these sites were not a focus of the five-year review.

Observations made during the site inspection indicated that the remedies at all sites were operating properly and successfully. No issues concerning the protectiveness of the remedies were noted. No activities were observed that would have violated ICs required in the ROD/Final RAPs.

#### 6.5 INTERVIEWS

Various NAVSTA TI stakeholders were interviewed, including DTSC, Water Board, TIDA, tenants, and local community members. Appendix A contains records of the interviews. In general, all individuals interviewed stated that they were well informed of site activities and were generally satisfied with the overall cleanup progress. Information generated from the interviews did not identify concerns regarding the protectiveness of the various remedies contained in the ROD/Final RAPs. Concerns raised during the interviews included:

- Noise and dust from ongoing activities
- Vandalism, especially trespassing and graffiti; for example, break-ins and theft of treatment system equipment (computer) and damage to monitoring wells at Site 24
- Desire for a faster cleanup with less time between phases

• Desire for a "greener" cleanup that is more focused on sustainable approaches

#### 7.0 TECHNICAL ASSESSMENT

Three questions will be examined in the technical assessment to evaluate whether the remedy at NAVSTA TI is protective of human health and the environment:

- *Question A:* Is the remedy functioning as intended by the decision documents?
- *Question B:* Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy still valid?
- *Question C:* Has any other information come to light that could call into question the protectiveness of the remedy?

Each of these questions is addressed in the following subsections. The discussion presented here is a framework for the protectiveness determination that explains the conclusions of the review.

#### 7.1 QUESTION A

#### Is the remedy functioning as intended by the decision documents? <u>Yes, for all sites</u>.

EPA's guidance document for five-year reviews identifies several areas to be considered in evaluating whether the remedy selected in the RODs is functioning as designed (EPA 2001). Areas of consideration include:

- Remedial action performance Is the remedy operating as designed? Does the current monitoring provide adequate information to assess the protectiveness and effectiveness of the remedy implemented?
- System operation and maintenance (O&M) Will the system and current O&M activities maintain the effectiveness of the response actions? Are there large variances between current annual costs and original cost estimates that might indicate potential remedy problems?
- Implementation of ICs and other measures Are these elements functioning as planned?
- Optimization opportunities Are there any areas for improvement?
- Early indications of potential issues Are there problems that could indicate that the remedy may not be protective or suggest protectiveness is at risk unless changes are made?

These considerations are discussed below, by site.

### 7.1.1 Site 21, Vessel Waste Oil Recovery Area

#### 7.1.1.1 Remedial Action Performance

A review of documents, site inspections, and interviews with personnel knowledgeable about the site indicates that the remedy as outlined in the ROD/Final RAP is functioning as designed.

Concentrations of COCs in groundwater have generally decreased over time, and the post-ROD/Final RAP groundwater monitoring data are below the remedial goals for all wells. Trend analysis of current and historical groundwater data has shown that COC concentration trends across Site 21 are stable or decreasing (TriEco-Tt 2014e). COC concentrations in well 21-IP07, the only well with concentrations above the remedial goals at the time that the ROD/Final RAP was signed, decreased to non-detect concentrations of cis-1,2-DCE and 0.19 microgram per liter ( $\mu$ g/L) of vinyl chloride. These concentrations are well below the remedial goals of 712  $\mu$ g/L and 165  $\mu$ g/L for cis-1,2-DCE and vinyl chloride, respectively.

Table 4 shows the soil gas concentrations measured at two of the monitoring locations, one sublab location underneath Building 3 (21-SG-27) and one subsurface location outside of Building 3 (21-SG-05). Note that chloroform is not a COC at Site 21, but is listed in Table 4 because it was detected at levels exceeding the SSSLs; detected chloroform concentrations are within the risk management range. VOC concentrations measured in soil gas indicate stable trends, both for locations inside Building 3 and exterior locations above the plume of VOCs in groundwater (TriEco-Tt 2014e). Exhibits 1 and 2 (below) illustrate the stable trends in soil gas concentrations at Site 21.

Although some VOCs in soil gas are above the SSSLs, the SSSLs were developed using the conservative end of the risk management range,  $10^{-6}$ . All current soil gas concentrations are within the cancer risk management range of  $10^{-4}$  to  $10^{-6}$  for commercial or industrial users. Soil gas concentrations at 21-SG-27, located underneath Building 3, are similar to the concentrations observed at the time that the ROD/Final RAP was signed, and therefore continue to slightly exceed the regulatory criteria with a hazard index greater than 1.

Concentrations of VOCs in soil gas at location 21-SG-27 control the need for a deed notice inside this portion of Building 3 (see Figure 3). These concentrations currently indicate the need for a deed notice; however, concentrations show a stable trend and further monitoring is not necessary until there is a change in the use of this portion of Building 3 that fully encloses this area. Similarly, concentrations of VOCs in soil gas at location 21-SG-05 in the exterior area above the plume of VOCs in groundwater continue to indicate the need for the restriction on residential reuse of a portion of Site 21 (see Figure 3 for this area). Soil gas concentrations in this area show a stable trend, and further monitoring is not needed until residential use is proposed for this portion of Site 21.

Inside Building 3, Location 21-SG-27									
Sample Date	PCE	TCE	Cis-1,2- DCE	Trans-1,2- DCE	Vinyl Chloride	Chloroform <sup>c</sup>			
2/8/12	2,100	810	7.6	0.5	2.2 U	16			
12/19/13	1,800	690	6.8	8.9 U	8.3 U	240			
4/8/14	2,000	730	8.2	11 U	11 U	220			
Commercial/Industrial Soil Gas SSSL <sup>a</sup>	83	120	6,132	10,512	6.3	21			
Outside, Location 21-SG-05									
Sample Date	PCE	TCE	Cis-1,2- DCE	Trans-1,2- DCE	Vinyl Chloride	Chloroform <sup>c</sup>			
11/18/10	13,000	1,800	70 U	70 U	70 U	70 U			
1/17/11	7,800	1,200	47 U	47 U	47 U	47 U			
11/10/11	18,000	2,700	8.3 U	63 U	41 U	10			
12/19/13	8,900	1,500	39 U	40 U	37 U	40 U			
4/8/14	10,000	1,800	60 U	61 U	57 U	61 U			
Commercial/Industrial Soil Gas SSSL <sup>b</sup>	5,731	7,732	416,024	733,877	335	1,151			
Residential Soil Gas SSSL <sup>b</sup>	569	655	49,527	87,366	33	706			

#### TABLE 4: VOC CONCENTRATIONS IN SOIL GAS AT SITE 21

Notes:

All concentrations in micrograms per cubic meter.

a Site-specific risk-based screening level for subslab soil gas monitoring probes for a commercial/industrial worker in an existing slab-on-grade building without engineered fill based on 10<sup>-6</sup> risk. Values from Table 3 of the Final HHRA Addendum (Shaw 2012d) as cited in the ROD/Final RAP (Navy 2013a).

Site-specific risk-based screening level for subsurface soil gas monitoring probes for a hypothetical future slab-on-grade building with engineered fill based on 10<sup>-6</sup> risk. Values from Table 4 of the Final HHRA Addendum (Shaw 2012d) as cited in the ROD/Final RAP (Navy 2013a).

c Chloroform is not a chemical of concern at Site 21.

DCE Dichloroethene

HHRA Human health risk assessment

- PCE Tetrachloroethene
- RAP Remedial action plan
- ROD Record of decision
- SSSL Site-specific screening level
- TCE Trichloroethene
- U Not detected at the listed reporting limit



Exhibit 1. Soil Gas Concentrations at 21-SG-27



Exhibit 2. Soil Gas Concentrations at 21-SG-05

Although concentrations of VOCs in soil gas exceed risk-based SSSLs, concentrations are similar to when the ROD/Final RAP was signed and potential risk to human health remains the same as when the risk management decision embodied in the ROD/Final RAP was made. ICs are in place to prevent unacceptable exposures. Concentrations of VOCs in soil gas at location 21-SG-27 control the need for a deed notice inside this portion of Building 3 (see Figure 3). These concentrations currently indicate the need for a deed notice; however, concentrations show a stable trend and further monitoring is not necessary until there is a change in the use of this portion of Building 3 that fully encloses this area. Similarly, concentrations of VOCs in soil gas at location 21-SG-05 in the exterior area above the plume of VOCs in groundwater continue to indicate the need for the restriction on residential reuse of a portion of Site 21 (see Figure 3 for this area). Soil gas concentrations in this area show a stable trend, and further monitoring is not necessary at the plume of Site 21 (see Figure 3 for this area). Soil gas concentrations in this portion of Site 21.

#### 7.1.1.2 System Operations and O&M

No significant O&M costs have been incurred for Site 21. Minor costs are expected for maintenance of the monitoring network and for enforcement of administrative ICs.

#### 7.1.1.3 Institutional Controls and Other Measures

The LUC RD (Navy 2013c) summarizes the ICs related to protection of the integrity of the remedy at Site 21. The IC performance objectives specified in the ROD/Final RAP and LUC RD are being met. The Navy conducts annual LUC inspections; the most recent inspection was conducted in March 2014. Except for missing bolts on the covers of some monitoring wells, no activities were observed that would have violated the ICs.

#### 7.1.1.4 Optimization and Early Indicators of Potential Problems

No opportunities for optimization or early indicators of potential problems were identified for Site 21 during this review. The network of groundwater and soil gas monitoring wells provides sufficient data to assess the condition of groundwater and soil gas at the site. The Navy, after review and concurrence by the BCT, intends to decommission monitoring wells that are no longer needed at Site 21.

## 7.1.2Site 27, Clipper Cove Skeet Range

#### 7.1.2.1 Remedial Action Performance

A review of documents, site inspections, and interviews with personnel knowledgeable about the site indicates that the remedy as outlined in the ROD/Final RAP is functioning as designed. The rock armor layer has achieved the RAO of preventing exposure to lead shot in sediment.

#### 7.1.2.2 System Operations and O&M

Construction of the remedy at Site 27 was completed in November 2013, and O&M activities have just begun. The first post-remediation bathymetric survey was planned for 1 year after remediation was complete; this survey was conducted in November 2014. Results of the survey will be used to evaluate whether any maintenance of the rock armor layer is necessary (for example, if erosion or other activities have created thin areas in the armor layer).

#### 7.1.2.3 Institutional Controls and Other Measures

The LUC RD (Tetra Tech EM Inc. 2013) summarizes the ICs related to protection of the integrity of the rock armor layer. An addendum to the LUC RD is planned to be prepared to address other aspects of the ICs at Site 27 to protect the remedy, which may include signage, limits on vessel speed, and restrictions on dredging within the boundary of Site 27. A draft addendum was prepared in November 2014 (MMEC 2014). The IC performance objectives are currently being met by access restrictions created by natural conditions (shallow water near shore) that minimize access by vessels that could potentially damage the rock armor layer. No activities were observed that would have violated the ICs.

#### 7.1.2.4 Optimization and Early Indicators of Potential Problems

No opportunities for optimization or early indicators of potential problems were identified for Site 27 during this review.

# 7.1.3Site 30, Daycare Center

## 7.1.3.1 Remedial Action Performance

A review of documents, site inspections, and interviews with personnel knowledgeable about the site indicates that the remedy as outlined in the ROD/Final RAP is functioning as designed. The building foundation slab has achieved the RAO of preventing exposure to dioxins in soil.

#### 7.1.3.2 System Operations and O&M

No significant O&M costs have been incurred for Site 30. Minor costs are expected for maintenance of the building slab and for enforcement of administrative ICs.

#### 7.1.3.3 Institutional Controls and Other Measures

The LUC RD (Trevet 2010b) summarizes the ICs related to protection of the integrity of the remedy at Site 30. ICs are in place to prevent penetration or removal of the foundation slab, except when following specific requirements to prevent exposure to potentially contaminated soil. The IC performance objectives specified in the ROD/Final RAP and LUC RD are being

met. The Navy conducts annual LUC inspections; the most recent inspection was conducted in March 2014. No activities were observed that would have violated the ICs.

#### 7.1.3.4 Optimization and Early Indicators of Potential Problems

No opportunities for optimization or early indicators of potential problems were identified for Site 30 during this review.

#### 7.2 QUESTION B

# Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of remedy selection still valid? <u>Yes</u>.

EPA's guidance document for five-year reviews identifies several areas to be considered in evaluating whether the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of remedy selection remain valid (EPA 2001). Areas of consideration include changes in standards and "to be considered (TBC)" criteria, changes in exposure pathways, changes in toxicity and other contaminant characteristics, changes in risk assessment methods, and expected progress toward meeting RAOs.

#### 7.2.1 Changes in Standards and TBCs

No changes to chemical-specific, location-specific, or action-specific ARARs established in the ROD/Final RAPs were identified that would bear on the protectiveness of the remedy.

## 7.2.2 Changes in Exposure Pathways

Physical site conditions or the understanding of these conditions have not changed in a way that could affect the protectiveness of the remedies. Land use at NAVSTA TI has not changed since the ROD/Final RAPs were signed; however, land use is expected to change as parcels are transferred and the land is redeveloped. Exposure assumptions developed in the HHRAs considered the potential future exposures based on the expected reuses. The future redevelopment plan (CCSF Planning Department 2011) did not introduce any new exposure scenarios that were not already taken into account by the HHRAs and ROD/Final RAPs.

No new human health or ecological routes of exposure that could affect the protectiveness of the remedies have been identified. No changes to site conditions that could result in increased exposure have been identified. No significant changes to the risk assessment methodology have occurred that would affect the protectiveness of the remedy. The vapor intrusion exposure pathway was considered during the risk assessments that were used to support remedy selection.

No new contaminants or contaminant sources originating from the sites have been identified or detected during monitoring. No unanticipated toxic byproducts have been generated as a result of remedy implementation.

The exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection are still valid.

#### 7.2.3 Changes in Toxicity and Other Contaminant Characteristics

There have been no changes to toxicity or other contaminant characteristics that would affect the protectiveness of the remedy. Although toxicity criteria for some COCs have changed, these changes will not affect the protectiveness of the remediation goals or RAOs.

#### 7.2.4 Expected Progress toward Meeting RAOs

The remedies are progressing as expected. Concentrations of COCs in groundwater at Site 21, where a remedy for groundwater has been implemented, indicate concentrations less than remediation goals or declining trends.

#### 7.3 QUESTION C

# Has any other information come to light that could call into question the protectiveness of the remedy? <u>No</u>.

No new human health or ecological risks have been identified. No weather-related incidents, earthquakes, or other natural disasters have affected the protectiveness of the remedies. No other information has been identified to suggest that the remedies may not be protective of human health and the environment.

#### 8.0 ISSUES, RECOMMENDATIONS, AND FOLLOW-UP ACTIONS

The following table presents issues, recommendations, and follow-up actions for NAVSTA TI.

Site	Issue	Affects Protectiveness (Y/N)		Recommendation and Follow-up	Party Responsible	Oversight Agency	Milestone Date
		Current	Future	Actions	•		
27	All ICs are not yet in place to protect the remedy	Ν	Y	An addendum to the LUC RD is needed to address remaining ICs to protect the remedy	Navy	State	Jan 2015

#### 9.0 PROTECTIVENESS STATEMENT

The following sections list the protectiveness statements for each site.

#### 9.1 SITE 21, VESSEL WASTE OIL RECOVERY AREA

The remedy for Site 21 is protective of human health and the environment. Soil gas and groundwater monitoring confirm that human health risk from the vapor intrusion pathway remains in the acceptable range. The IC performance objectives specified in the ROD/Final RAP are being met by access controls until the time of transfer to prevent potential exposure. The effective implementation of IC performance objectives through land use and activity restrictions incorporated into deeds and CRUPs at the time of transfer will effectively prevent exposure to COCs and prevent activities that could damage the integrity of the remedy following transfer of the property.

#### 9.2 SITE 27, CLIPPER COVE SKEET RANGE

The remedy for Site 27 is protective of human health and the environment. The rock armor layer is preventing exposure of diving ducks to lead shot in sediment within 75 feet of the shoreline. Site 27 does not pose a risk to human health because there is no pathway for exposure to humans. The IC performance objectives specified in the ROD/Final RAP are being met by access restrictions created by natural conditions (shallow water near shore) that minimize access by vessels that could potentially damage the rock armor layer. The effective implementation of IC performance objectives through land use and activity restrictions incorporated into deeds and CRUPs at the time of transfer will effectively prevent exposure to COECs and provide controls for the continued protectiveness of the remedy.

#### 9.3 SITE 30, DAYCARE CENTER

The remedy for Site 30 is protective of human health and the environment. The building foundation slab is preventing exposure to dioxins in soil. The IC performance objectives specified in the ROD/Final RAP are being met by access controls until the time of transfer to prevent potential exposure. The effective implementation of IC performance objectives through land use and activity restrictions incorporated into deeds and CRUPs at the time of transfer will effectively prevent exposure to COCs and prevent activities that could damage the integrity of the remedy following transfer of the property.

#### 10.0 NEXT REVIEW

The next (second) five-year review will be completed in 2019, 5 years from the date of this first five-year review report.

#### 11.0 REFERENCES

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APPENDIX A INTERVIEW FORMS



SITE IDENTIFICATION				
Site Name: Naval Station Treasure Island			EPA ID: CA7170023330	
Subject: Five-year Review of R	emedial Actions		Time: 11:00 am	Date: 6/19/2014
Type:	🖾 Visit 🗌 I	Email	Other	
Location of Visit: Treasure Islan	nd			
	CONTACT	MADE BY:		
Name: Keith Forman	Title: BRAC Environn Coordinator	nental	Organization: Nav	ý
Name: Tim Mower	Title: Project Manager		Organization: TriE	co-Tt
Name:	Title:		Organization:	
	INDIVIDUAL (	CONTACTED	-	
Name: Remedios Sunga	Title: Project Manager		Organization: DTSC	
Telephone: (510) 540-3840     Address: 700 Heinz Avenue				
Fax: (510) 540-3819	City: Berkeley	-	State: CA	Zip: 94710
E-mail address: remedios.sunga	@dtsc.ca.gov			
SUMMARY OF CONVERSATION				
1. What is your overall impression of the cleanup work conducted at Naval Station Treasure Island?				and?
I'm glad that the investigation and cleanup of contamination at Treasure Island (TI) happening in a faster pace now. The Navy has been receptive in regulator's request for further radiological investigations at TI.				
<ul><li>2. Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please give purpose and results.</li><li>Yes. DTSC is the lead state regulatory agency for the environmental cleanup at TI. As DTSC Project for TI, I review documents and provide comments, attend meetings, and conduct site visits/inspections.</li></ul>				

3. Have there been any complaints, violations, or other incidents related to the site requiring a response by your office? If so, please give details of the events and results of the responses.

I am not aware of any complaints, violations or incidents that require direct response from DTSC. I have received calls from residents with concerns on site contaminants and their health, and I have referred them to the San Francisco Department of Health.

4. Do you feel well informed about the site's activities and progress?

Yes. The Navy holds monthly progress meetings with the project team. I also receive emails and phone calls from Navy Project Managers on site activities and progress.

5. Do you have any comments, suggestions, or recommendations regarding the site?

Thank you to the Navy for their efforts in completing the cleanup at TI and Yerba Buena Island, and their outreach program in keeping the community informed.



SITE IDENTIFICATION				
Site Name: Naval Station Treasure Island EPA ID: CA7170023330			23330	
Subject: Five-year Review of R	emedial Actions		Time: 9:00 – 11:00	Date: 6/19/14
Type:			Other	
Location of Visit: Sites 21, 27, 3	0, 31, 33.			
	CONTACT N	MADE BY:		
Name: Keith Forman	Title: BRAC Environmental Coordinator		Organization: Navy	
Name: Tim Mower	Title: Project Manager		Organization: TriEco-Tt	
Name:	Title:		Organization:	
INDIVIDUAL CONTACTED				
Name: Myriam Zech Title: Water Resource Control Engineer		Organization: Wate	er Board	
Telephone: 510-622-5684     Address: 1515 Clay Street				
Fax: City: Oakland		State: CA	Zip: 94612	
E-mail address: myriam.zech@waterboards.ca.gov				
SUMMARY OF CONVERSATION				

1. What is your overall impression of the cleanup work conducted at Naval Station Treasure Island?

My overall impression of the cleanup work at TI is good. I think that at one point during the initial investigation, sites 30, 31 and 33 would have been good candidates for incremental sampling, which results in a higher degree of confidence in decision making and can often help minimize cleanup costs.

2. Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please give purpose and results.

Yes. I conduct site inspections periodically in order to be aware of the progress of the clean up and to inform our Board and management of the progress at individual sites. Inspections sometimes result in an "EO item" for our Board – i.e. a short background summary with a description of the ongoing cleanup activities at a particular site. Recently we have written such articles for Site 27 and for Site YF3.

3. Have there been any complaints, violations, or other incidents related to the site requiring a response by your office? If so, please give details of the events and results of the responses.

Yes. I have received several inquiries from Spanish-speaking residents, regarding soil contamination at Site 12. I have spoken with each caller in person and shared soil data located in the June 2012 RI Report.

4. Do you feel well informed about the site's activities and progress?

Yes. I also appreciate Navy RPMs' patience with my questions, as well as their sometimes detailed responses.

5. Do you have any comments, suggestions, or recommendations regarding the site?

Yes. I think that when appropriate (for example for soil investigations) the Navy should consider an incremental sampling approach rather than the discrete sampling approach that has been used traditionally.



SITE IDENTIFICATION				
Site Name: Naval Station Treasure Island			EPA ID: CA7170023330	
Subject: Five-year Review of R	emedial Actions		Time:	Date: 6/30/14
Type:	🗌 Visit 🛛 🖾	Email	Other	
Location of Visit: Email				
	CONTACT	MADE BY:		
Name: Keith Forman	Title: BRAC Environn Coordinator	nental	Organization: Navy	
Name: Tim Mower	Title: Project Manager		Organization: TriE	co-Tt
Name:	Title:		Organization:	
	INDIVIDUAL (	CONTACTED		
Name: Robert Beck	Title: Treasure Island I	Director	Organization: Treasure Island Development Authority	
Telephone: 415-274-0662		Address: One	Avenue of the Palms,	Ste 241
Fax: 415-274-0299	City: San Francisco		State: CA	Zip: 94130
E-mail address: <u>bob.beck@sfgov.org</u>				
SUMMARY OF CONVERSATION				
1. What is your overall impression	on of the cleanup work co	onducted at Nava	l Station Treasure Isl	and?
My overall impression of the cleanup work on Treasure Island is favorable. The commitment of the Navy personnel, consultants and contractors to fulfilling their cleanup responsibilities is clear and the relationships with the regulatory agencies and TIDA (the local jurisdiction) are collaborative & positive.				
<ul><li>2. Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please give purpose and results.</li><li>I interact regularly and routinely with Navy personnel on the various remediation projects on the Island including participating in the RAB and BCT meetings, planning for FOSTs &amp; FOSLs, land transfer schedule, etc.</li></ul>				

3. Have there been any complaints, violations, or other incidents related to the site requiring a response by your office? If so, please give details of the events and results of the responses.

We continue to work with the Navy and regulators to address questions and concerns raised by residents about the current environmental conditions on the island, potential concerns created by the disturbance and transportation of contaminated soils during remediation activities, and the future condition of the island. Generally, the communication efforts of the Navy have been positive & effective, but it requires constant effort to maintain the trust of stakeholders and to address misinformation & misperceptions when they occur.

4. Do you feel well informed about the site's activities and progress?

I feel that I am well-informed.

5. Do you have any comments, suggestions, or recommendations regarding the site?

There has been a lot of effort put into communicating with residents since the 2013 draft Communications Plan Update was issued – some of which has included the implementation of measures called out in the draft plan and some of which has reflected continued refinement &/or revisions to the recommendations. It would be good to finalize the Communications Plan Update to give all of us a roadmap against which to plan our efforts going forward and measure our progress.



SITE IDENTIFICATION					
Site Name: Naval Station Treasure Island			EPA ID: CA7170023330		
Subject: Five-year Review of I	Remedial Actions		Time: 1405-1420	Date: 6-19-14	
Type: 🛛 Telephone	Uvisit I F	Email	Other	<u></u>	
Location of Visit: via telephone	;				
	CONTACT I	MADE BY:			
Name: Keith Forman	Title: BRAC Environn Coordinator	nental	Organization: Navy	y	
Name: Tim Mower	Title: Project Manager		Organization: TriEco-Tt		
Name:	Title:		Organization:		
	INDIVIDUAL (	CONTACTED	-		
Name: Alice Pilram	Title: Community men RAB co-chair	Title: Community member and RAB co-chair		Organization: NA	
Telephone: 415.600.0702		Address: 3700	) California Street		
Fax:	City: San Francisco	•	State: CA	Zip: 94118	
E-mail address:					
SUMMARY OF CONVERSATION					
1. What is your overall impression of the cleanup work conducted at Naval Station Treasure Island?					
Thoroughly satisfied. Although don't read all reports in depth, do review as many as possible. Understand that the Navy is doing as much as possible to provide information and to not cover anything up. TI is complicated by the fact that residents live at the site. Navy is doing an excellent job and no complaints.					
<ul><li>2. What effects have site operations had on the surrounding community?</li><li>The community seems irritated by the construction but understands that the Navy is trying to minimize the</li></ul>					
impacts (for example, truck traffic and dust). There are other contractors working on site besides the Navy, too.					

The community seems irritated by the construction but understands that the Navy is trying to minimize the impacts (for example, truck traffic and dust). There are other contractors working on site besides the Navy, too. Have noticed that some soil and debris piles have been removed. Overall, the effects are not too deleterious and some people will always complain anyway.

3. Are you aware of any community concerns regarding the site or its operation and maintenance? If so, please give details.

Aware of chatter on TI health network "neighborhoods" website that has a negative tone. Attempt to calm others and counter this impression and encourage others to listen more to the Navy's statements. Opening a health clinic at TI may be helpful for tracking future health issues as well as increasing health education and awareness.

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

Not really, other than one apartment fire. Some graffiti on buildings and fences cut in places. Saw three individuals climbing on a retaining wall on the Oakland side of Yerba Buena Island and reported this to the police.

5. Do you feel well informed about the site's activities and progress?

Very well informed based on position as Restoration Advisory Board (RAB) co-chair. Send emails to the Navy frequently and Navy staff are accessible and quick to respond.

6. Do you have any comments, suggestions, or recommendations regarding the site?

No suggestions. Treasure Island Development Authority (TIDA) meeting announcements could be more timely. Just received an announcement for a meeting scheduled to occur in 2 days which is not enough lead time. TIDA should be more inclusive of YBI residents, especially considering most are full-time professional workers with busy schedules.



#### **Interview Record**

SITE IDENTIFICATION					
Site Name: Naval Station Treasure Island			EPA ID: CA7170023330		
Subject: Five-year Review of I	Remedial Actions		Time: 6:30 pm	Date: 6/25/14	
Type:	🛛 Visit 🗌 I	Email	Other		
Location of Visit: Casa de La V	ista, Treasure Island				
CONTACT MADE BY:					
Name: Keith Forman	Title: BRAC Environmental Coordinator		Organization: Navy		
Name: Tim Mower	Title: Project Manager		Organization: TriEco-Tt		
Name: Jessica O'Sullivan	Title: Project Manager		Organization: TriEco-Tt		
	INDIVIDUAL (	CONTACTED			
Name: Dale Smith	Title: RAB member	Title: RAB member		Organization: RAB	
Telephone: Address:					
Fax:	City:	•	State: CA	Zip:	

E-mail address:

#### SUMMARY OF CONVERSATION

1. What is your overall impression of the cleanup work conducted at Naval Station Treasure Island?

Laboriously slow. It costs too much. Commercial accounts would not tolerate carrying those expenses for so many years. Should have done a more thorough characterization initially on sites that indicated they would be complex to move them along efficiently. Once an alternative is chosen and designed, work is very thorough. Site 24 biobarrier wells and containment wells are an example of very well installed containment strategy, as is the site 21 perimeter wells to keep the plume from expanding and reentering the bay.

2. What effects have site operations had on the surrounding community?

Every time radiological issues come up at Site 12, people aren't getting enough information; reading articles makes them upset about living conditions, but they don't go to meetings. Navy used to go to their meetings, but there the public wasn't interested in cleanup issues. Other people/groups come up/forward with concerns (such as wind surfers) when specific actions impact them. Usually they are understanding, although Ryan Miya had to "negotiate" with the wind surfers at one point. Commercial groups (sailing center) also speak up and the marina operation was concerned about the remedial action (rock armor) in Site 27.

3. Are you aware of any community concerns regarding the site or its operation and maintenance? If so, please give details.

At the moment, no overall, other than Site 12.

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

Extraordinarily upset about all the vandalism on site. Regularly see vandals breaking in. Fires happen on the base. Phase III treatment of Site 24, contractor set up main frame computer to run the program but thieves broke in and stole it. Monitoring wells get damaged too. Site 21 controlled by Google seems to have had many monitoring wells damaged during that time in one year (2013).

5. Do you feel well informed about the site's activities and progress?

Yes I do. Historically, even if you read only the meeting minutes, the detail is there. The presentations aren't blow-by-blow explanations, but we do hear about the program. The navy doesn't disclose problems with contractors, but otherwise is informative. I am probably the only one who reads the documents at this base and writes comments or asks questions, but presentations gives the rest of the RAB a good understanding of what has been happening.

However, in the last year and a half the navy has focused almost exclusively on residential concerns at Site 12. As a result we spend an inordinate amount of time listening to complaints about potholes, dust from construction, green water and mold. None of these issues is an element of the cleanup program. Other RAB members have expressed the feeling that this has become a waste of time. The navy doesn't control the meetings to focus on cleanup. We have not had presentations or discussions on "action" documents, such as the Site 6 Proposed Plan, the Bigelow Court Work Plan, Site 27 Remedial Design, Site 33 Remedial Design Amendments, Site 21 Land Use Controls RD/RAWP (LUCs are historically a BIG issue for this RAB) and most recently the Site 24 FS Addendum. In order to get questions answered during the review period I am obligated to barge in and demand answers, something I very much dislike having to do. The regulators have assured me this does not reflect badly on me. I am as a result generally ignored by the navy, so they can focus on the community. Our meetings run ridiculously late considering we don't cover cleanup issues.

6. Do you have any comments, suggestions, or recommendations regarding the site?

- Wish there were a way to streamline the process so it is completed faster. Big gaps between phases. The Army and the Air Force have used a different strategy and appear to be farther along, possibly because of their process.
- Wish it were a "greener" cleanup. That would have to be set it up upfront (green fuel vehicles, wind powered energy sources, etc.), but many environmental advances we now take for granted were started with the federal government insisting vendors demonstrate their use (a simple example is recycled paper).
- Five year reviews and longtime monitoring are very expensive; sometimes 2/3 the cost of remediation. More comprehensive characterization and remediation could actually reduce costs in some cases.
- Allow RAB comments and questions first during presentations, so they get a clear understanding of the program and its progress. Then allow the public to comment. When they go over the allotted time, it wouldn't be such an issue as they frequently are asking questions outside the cleanup process anyway.

Pax - 570 -433-0830



### **Interview Record**

		SITE IDENT	FIFICATIO	DN		
Site Name: Naval Station Treasure Island			EPA ID: CA7170023330			
Subject:	Five-year Review of	Remedial Actions			Time: 9am	Date: 6/9/14
Туре:	Telephone	🗌 Visit 🛛	Email		Other	······································
Location	of Visit:					
		CONTACT	MADE BY	:		
Name: k	Keith Forman	Title: BRAC Environ	mental		Organization: Navy	
Name: T	îm Mower	Title: Project Manager	r		Organization: Tri	Eco-Tt
Name:		Title:			Organization:	
		INDIVIDUAL	CONTACT	ГED		
Name: 14	athie Autumn	Title: Puxnam Ma	nager	(	GATUANC CHANT Organization: The	HES CYO WWW ESLOWICO
Telephon	e: 415 834-061	4 x 9	Address:	850,	AveD	
Fax(41)	-7834-0612	City: Sig Francia	°co		State: CA	Zip: 94/30
E-mail ac	ldress: KAntur	MN @ CCCYG. OL	5	I		
		SUMMARY OF C	ONVERSA	TION		
1. What	is your overall impress	ion of the cleanup work co	onducted at	Naval	Station Treasure Is	land?
I'm not seeing any piogress						
2. What e	effects have site operat	ions had on the surroundin	ng communi	ity?		
Not seeing any happening						

3. Are you aware of any community concerns regarding the site or its operation and maintenance? If so, please people always comment about the capitation

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

No as far as island clean-up with but we de get trespassen in the child development center yards ofter boun & weekends

5. Do you feel well informed about the site's activities and progress?  $I_{fef} emerged$ 

on island and people off island

6. Do you have any comments, suggestions, or recommendations regarding the site?

Get the abandoned buildings tern down on the island - leids (ten) are hangery out in them - squatter also - and They look tenible hert to the childcare center canong familier to NOT enroll. APPENDIX B RESPONSES TO COMMENTS ON THE DRAFT FIVE-YEAR REVIEW

The table below contains the responses to comments received from the regulatory agencies on the "Draft First Five-Year Review of Remedial Actions, Former Naval Station Treasure Island, San Francisco, California," dated October 7, 2014. The comments addressed below were received from the California Environmental Protection Agency (Cal/EPA) Department of Toxic Substances Control (DTSC), the Cal/EPA Regional Water Quality Control Board, San Francisco Bay Region (Water Board), the Treasure Island Development Authority (TIDA), and the Restoration Advisory Board (RAB). Throughout this table, *italicized* text represents additions to the document and strikeout text indicates deletions.

#### **RESPONSES TO COMMENTS FROM DTSC (MS. REMEDIOS SUNGA, DATED NOVEMBER 4, 2014)**

COMMENT	RESPONSE
<b>Comment 1:</b> Five-Year Review Summary Form, Page ES-3. Type of Review: The "Non-NPL Remedial Action Site" should also be checked.	<b>Response:</b> The summary form has been revised as requested.
<b>Comment 2:</b> Section 9.1-Protectiveness Statement, Site 21, Page 46. Please change "ROD/RAP" to "ROD/Final RAP" throughout the document.	<b>Response:</b> The term "ROD/RAP" has been changed to "ROD/Final RAP" at appropriate locations throughout the document.
<b>Comment 3:</b> Section 9.2-Protectiveness Statement, Site 27, Page 46. Please clarify that the detected contaminants at Site 27 do not pose risk to human health. The remedy was implemented to	<b>Response:</b> The text in Section 9 and the summary form in the Executive Summary have been expanded as follows.
protect diving ducks which were identified as the only receptor of concern at Site 27.	"The rock armor layer is preventing exposure of diving ducks to lead shot in sediment within 75 feet of the shoreline. Site 27 does not pose a risk to human health because there is no pathway for exposure to humans. The IC performance objectives"

#### **RESPONSES TO COMMENTS FROM THE WATER BOARD (MS. MYRIAM ZECH, DATED NOVEMBER 19, 2014)**

COMMENT	RESPONSE
<b>Comment 1:</b> The Water Board does not have comments on the First Five-Year Review for Treasure Island.	Response: Comment noted.

### RESPONSES TO COMMENTS FROM LANGAN TREADWELL ROLLO ON BEHALF OF TIDA (MR. CHRISTOPHER GLENN, DATED OCTOBER 24, 2014)

COMMENT	RESPONSE
<b>Comment 1:</b> TIDA does not have comments on the First Five-Year Review for Treasure Island.	Response: Comment noted.

RESPONSES TO COMMENTS FROM THE RAB (MS. DALE SMITH, DATED NOVEMBER 7, 2014)		
COMMENT	RESPONSE	
<b>Comment 1:</b> First, let me congratulate the Navy on its first Five-Year Review for Treasure Island. Although Alameda is on its third such review, that base isn't being cleaned up to as high a level as Treasure Island is. It has been a long, difficult process to get to this point and although the sites are few now, they will grow exponentially in the next few years as implied in the text.	Response: Comment noted.	
<b>Comment 2:</b> Background. Both the chemical specific excess cancer risk and chemical specific incremental hazard risk for soil gas are based on $\mu$ g/L concentrations collected during sampling results. When using conventional standards concentrations are within the risk management range for non-residential receptors. The Navy has chosen to use a software package that does not conform to other assessment standards to declare clean up complete. That company has a liability release disclaimer not presented in the Five Year Review that states accuracy, correctness and completeness may be inaccurate and that the company is not to	<b>Response:</b> Concentrations of chemicals detected in soil gas are expressed in units of micrograms per cubic meter ( $\mu$ g/m <sup>3</sup> ) and concentrations of chemicals detected in groundwater are expressed in units of micrograms per liter ( $\mu$ g/L). Use of these units follows standard industry practice and is consistent with regulatory agency and Navy conventions. The two graphs of soil gas concentrations included in the five-year review (as Exhibits 1 and 2) are presented as simple concentration versus time plots and are not evaluated using Mann-Kendall trend analysis in the five-year review. The graphs are not intended to show that remaining contamination is negligible. Rather, they show trends in concentrations in soil gas are stable. As a result, the risk posed to current site users remains stable and similar to that estimated at the signing of the	

RESPONSES TO COMMENTS FROM THE RAB (MS. DALE SMITH, DATED NOVEMBER 7, 2014)		
COMMENT	RESPONSE	
be held liable. In addition, its calculations are not compatible to previous sampling units. I found it odd to find the particular Mann-Kendall trend analysis for Site 21 included in the Five Year Review. The two chosen appear to imply that the contamination remaining is negligible and yet in the Draft Remedial Action Completion Report (RACR) there were others that showed a more volatile situation. There were five maps in all in the RACR, three of which showed increases as well as decreases over time, both in the groundwater monitoring wells and the soil gas sampling wells. Of the two chosen for the Five Year Review one was not included in the RACR and that one shows rebound indicating the source has not been completely addressed. Why not use the more commonly used sampling data, in $\mu g/L$ , to facilitate comparison to previous documents and relate easily to regulatory thresholds?	Site 21 record of decision / final remedial action plan (ROD/Final RAP).	
<b>Comment 3:</b> Even if the units chosen are accepted, it doesn't seem correct to say that the VOC soil gas concentrations are "well below" or "slightly above" Site-Specific Screening Levels (SSSLs) when the Commercial/Industrial Soil Gas SSSL for PCE is 83 and the sample is 2.5 times higher. This is also true for TCE. This doesn't seem "slight."	<b>Response:</b> The description relates to a comparison of the estimated risk (hazard index), and not the actual concentrations. The text in Section 7.1.1.1 states "Soil gas concentrations at 21-SG-27, located underneath Building 3, are similar to the concentrations observed at the time that the ROD/Final RAP was signed, and therefore continue to <u>slightly exceed the regulatory criteria</u> with a hazard index greater than 1." The interpretation of the comparison as "slight" is consistent with the text, which describes the remedy in the ROD/Final RAP: "where the risk estimates calculated in the HHRA addendum <u>slightly exceed regulatory criteria</u> for commercial/industrial occupants" In this case, the regulatory criteria refer to the hazard index threshold of 1 for noncarcinogenic chemicals. Refer to the HHRA Addendum (Shaw 2012) for details of the estimated risk posed by chemicals in soil gas. The second bullet in Section 4.1.2 contains the complete description of the need for a deed notification for the area around 21-SG-27 because concentrations in soil gas slightly exceed regulatory criteria. In summary, the five-year review uses	

RESPONSES TO COMMENTS FROM THE RAB (MS. DALE SMITH, DATED NOVEMBER 7, 2014)		
COMMENT	RESPONSE	
	characterizations and language already agreed to in the ROD/Final RAP for Site 21.	
<b>Comment 4:</b> Understanding that the data will drive restrictions, it seems evasive not to use more conventional statistics derived from previous investigations to indicate existing contamination and the need for use restrictions. This may be another example of military preference for gadgets for gadget sake. Given the small data set (five samples) how can the results possibly be considered reliable? Can the Navy justify the cost at this base other than to justify no further action?	<b>Response:</b> As noted in the response to RAB Comment 2, soil gas data are not evaluated using Mann-Kendall trend analysis in the five-year review. Nevertheless, Mann-Kendall trend analysis is considered valid for data sets with four to 40 samples (Connor, Farhat, and Vanderford 2014). The software for the analysis is available for no charge on line at http://www.gsi-net.com/en/software/free-software/gsi-mann-kendall-toolkit.html The data indicate stable trends in soil gas concentrations and similar levels of potential risk to human health as when the ROD/Final RAP for Site 21 was signed. Land use controls are an action and do not indicate no further action is needed. The land use control restrictions are based on historical groundwater and soil gas monitoring that was done across Site 21.	
<b>Comment 5:</b> Minor Issues. Page 8. It feels rather literary, not to mention incorrect or at least an obscure meaning of the word, to use the term "compose" to describe property area. Perhaps "contain" or "encompass" as used earlier would not be so jarring.	<b>Response:</b> The text has been revised as follows. "The U.S. Coast Guard owns 30 of the 147 acres that <i>make up</i> compose-YBI."	
<b>Comment 6:</b> Page 24. Remove "its current location at." The Pandemonium has been recycled into something different by now and is no longer currently located in Site 32.	<b>Response:</b> The text has been revised as requested.	

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APPENDIX D SITE INSPECTION CHECKLIST



I. SITE INFORMATION					
Site Name: Naval Station Treasure Island		Date of Inspection: June 19, 2014			
Location and Region: San Francisco, California		<b>EPA ID</b> : CA7170023330			
Agency, office, or company		Weather/			
leading the five-year review:	U.S Department of Navy	<b>Temperature</b> : Sunny and breezy, upper	60s to low 70s		
Remedy Includes: (Check all that	t apply)				
Landfill cover/containment	t 🗌 Monitored natura	al attenuation 🛛 🖂 Institutional o	controls		
🖂 Access controls		tainment 🗌 Vertical barrie	er walls		
☐ Groundwater pump and treatment ☐ Surface water coll		lection and treatment 🛛 🛛 Groundwater monitoring			
Other Cover/containment	t remedies apply at Sites 27 and 30. T	he cover at Site 27 is an undersea cover (filte	er layer and rock		
armor layer) over sediment. Th	he Building 502 foundation slab provi	des the cover at Site 30.			
Inspection focuses on the comp	bleted remedies at IR Sites 21, 27, and	30. Sites 31 and 33, where remedial actions	have been		
completed in accordance with a	a record of decision, were also visited.				
Attachments: 🛛 Inspection tear	n roster attached 🛛 Site map attacl	ned (see Figure 2 of main report)			
II. INTERVIEWS (Check all that apply)					
O&M site manager					
Not applicable Na	me	Title	Date		
Interview: 🗌 at site	☐ at office ☐ by phone	phone no	-		
Report attached:					
Problems, regulations or policy cha	unges, suggestions: No active, on-goir	g O&M activities for the five sites for the 5-v	vear review.		
Trobenis, regulatoris or policy changes, suggestions. To active, on going own activities for the sites for the 5 year review.					
O&M staff					
o an stan					
Not applicable					
Na	ime	Title	Date		
Interview: 🗌 at site	□ at office □ by phone	phone no	-		
Report attached:					
Problems, suggestions:					

<b>Local regulatory authorities and response ag</b> department, office of public health or environmenta all that apply.	<b>gencies</b> (that is, State and al health, zoning office, reco	Tribal offices, emergency o order of deeds, or other cit	response office, police y and county offices, etc.) Fill in			
Agency <u>Treasure Island Development Authority</u>	ý					
Contact Bob Beck	Treasure Island Director		6/30/14			
Name	Title		Date			
Interview: 🗌 at site 🗌 at office	🛛 by phone (email)	phone no <u>.</u>				
Report attached: <u>See Appendix A</u>						
Problems, suggestions:						
<b>Other interviews</b> (optional)						
_Community residents, DTSC, and Water Board (se	ee Appendix A)					
Report attached: <u>See Appendix A</u>						
Problems, suggestions:						
III. ON-SITE DOCU	MENTS & RECORDS VI	ERIFIED (Check all that a	pply)			
A. O&M Documents						
🗌 O&M manual 🔤 Read	ily available	Up-to-date	N/A			
🛛 As-built drawings 🔅 Read	🛛 Readily available		□ N/A			
Maintenance logs     Readily available		🔲 Up-to-date	🖂 N/A			
Remarks: Documents are available in the Administrative Record and the information repositories. Ongoing, routine O&M beyond inspection and repairs (if necessary) is not required at Sites 21, 27, and 30. As-built drawings are available in remedial action completion report for Site 27.						
B. Site-Specific Health and Safety Plan	🛛 Readily available	🛛 Up-to-date	□ N/A			
Contingency plan/emergency response plan	Readily available	Up-to-date	🖂 N/A			
Remarks: Health and safety plans confirmed by the ROICC for contractors with continuous site presence (CB&I, Gilbane, and TtEC).						
C. O&M and OSHA Training Records:	🛛 Readily available	🛛 Up-to-date	□ N/A			
Remarks: OSHA training records confirmed by the ROICC for contractors with continuous site presence (CB&I, Gilbane, and TtEC).						
D. Permits and Service Agreements:						
Air discharge permit	Readily available	Up-to-date	⊠ N/A			
Effluent discharge	Readily available	Up-to-date	$\square$ N/A			
U Waste disposal, POTW	Readily available     Readily available	Up-to-date	⊠ N/A ⊠ N/A			

Remarks:					
E. Gas Generation Records:	Readily available	🔲 Up-to-date	N/A		
Remarks:					
<b>F. Settlement Monument Records:</b> Remarks:	🔲 Readily available	Up-to-date	⊠ N/A		
G. Groundwater Monitoring Records:	🛛 Readily available	🛛 Up-to-date	□ N/A		
Remarks: Historical groundwater monitoring record	ls are readily available in t	he Administrative F	Record and the information		
repositories.					
H. Leachate Extraction Records:	🔲 Readily available	Up-to-date	N/A		
Remarks:					
I. Discharge Compliance Records:					
Air	Readily available	Up-to-date	N/A		
Water (effluent)	Readily available	Up-to-date	X N/A		
Remarks:					
J. Daily Access/Security Logs:               Readily available             Up-to-date             Vp-to-date             N/A           Remarks: No guarded security gates for basewide access; tenants at some individual buildings maintain their own access requirements             (for example, Building 3 at Site 21 and Building 502 at Site 30).					
	COSTS 🗌 Applicable	e 🛛 N/A			
A. O&M Organization					
State in-house	☐ State in-house ☐ Contractor for State				
PRP in-house	Contractor for PRP				
Federal Facility in-house	☐ Federal Facility in-house ⊠ Contractor for Federal Facility				
Remarks: O&M activities are applicable only for Site 27 and only include routine bathymetric surveys. The first routine bathymetric					
survey is due 1 year from completion of the remedial action (December 2014) so no costs are available yet.					
B. O&M Cost Records					
🗌 Readily available	🗌 Up-to-date				
Funding mechanism/agreemen	it in place				
Original O&M cost estimate:\$10,000 every 5 yearsBreakdown attached					
Routine U&M costs were included in the feasibility study for monitoring and inspection at \$10,000 per event and one event every 5 years.					
Total annual cost by year for review period: no costs incurred yet					

From	То				E	Breakdown attached
From	То				E	Breakdown attached
From	То					Breakdown attached
From	То					Breakdown attached
C. Unanticipated or Unusually High O&M Costs During Review Period Not applicable.						
	V. ACCESS AND INST	TITUTIONAL CO	NTROLS	Applicable	n∕A	
A. Fenc	ing					
Remarks	Fencing damaged Lo	ocation shown on s	ite map	🗌 Gates secu	red [	⊠ N/A
B. Othe	r Access Restrictions					
	] Signs and other security measures 🛛 🗌 L	location shown on	site map	N/A		
Remarks	:					
C. Instit	tutional Controls (IC):					
1. Imple Site	ementation and Enforcement: conditions imply ICs not properly implemen	ited 🗌 Yes		N/A		
Site	conditions imply ICs not being fully enforced	d 🗌 Yes		N/A		
Type of m Frequenc	Type of monitoring (e.g., self-reporting, drive-by): <u>Site LUC inspections at Sites 21 and 30</u>					
Responsi	ble party/agency: <u>TriEco-Tt</u>					
Contact	: Cindi Rose			March 26-27.	2014	(510) 302-6286
	Name	Title		Date		Phone no.
Reporting	g is up-to-date		🖂 Yes	□ No	∏ N/A	
Reports a	are verified by the lead agency		🖂 Yes	□ No	□ N/A	
Specific r	equirements in deed or decision documents	have been met	🖂 Yes	🗌 No	□ N/A	
Violation	s have been reported		<b>Yes</b>	🛛 No	□ N/A	
Other problems or suggestions:						
IC compliance monitoring reports for Sites 21 and 30 found all aspects of ICs in compliance, except for some missing well covers at Site 21. Reports are available in the Administrative Record and the information repositories.						
2. Adequ Remarks	uacy: :	🛛 ICs are adequ	ate 🗌	ICs are inadeq	uate 🗌	] N/A
D. General						
--						
1. Vandalism/Trespassing						
Remarks: Vandalism (especially graffiti) was evident during the site inspection. One resident reported a trespassing incident to the						
police (was located on Yerba Buena Island).						
2. Land use changes on-site XN/A						
Remarks						
3 Land use changes off site $\bigvee N/A$						
Remarks.						
VI. GENERAL SITE CONDITIONS						
A. Roads						
<b>Decision</b> $\square$ Legation shown on site map $\square$ Peads adequate $\square$ N/A						
Koads damaged     Location shown on site map     Koads adequate     IV/A						
reads at various locations across the base						
B. Other Site Conditions:						
VII. COVERS 🗌 Applicable 🛛 N/A (Site 30 building slab only)						
A. Cover Surface						
1. Settlement (Low spots) 🗌 Location shown on site map 🛛 Settlement not evident						
Areal extent Depth						
Remarks: Settlement not evident.						
2 Cracks  Location shown on site map  Cracking not evident						
LengthsWidthsDepths						
Remarks: There are no cracks evident in the slab.						
3. <b>Erosion</b> $\Box$ Location shown on site map $\boxtimes$ Erosion not evident						
Areal extent Depth Remarks: Erosion from storm events is not evident						
Kentarks. Elosion nom storm events is not evident.						
4. Holes  Location shown on site map  Holes not evident						
Areal extent Depth						
Remarks: No holes were observed in the slab.						
5. Vegetative Cover Grass Cover properly established No signs of stress						
Remarks: Not applicable						
6. Alternative Cover (armored rock, concrete, etc.)						
Remarks: Building slab appears to be in good condition.						

7. Bulges       □       Location shown on site map       □       Bulges not evident         Areal extentHeight       Height       □       Bulges not evident
Remarks: Not applicable.
8. Wet Areas/Water Damage       Wet areas/water damage not evident         Wet areas       Location shown on site map       Areal extent         Ponding       Location shown on site map       Areal extent         Seeps       Location shown on site map       Areal extent         Soft subgrade       Location shown on site map       Areal extent         Remarks:       No water damage observed.       Areal extent
9. Slope Instability       Slides       Location shown on site map       No evidence of slope instability         Areal extent       Remarks: Not applicable.       No evidence of slope instability
<b>B. Benches</b> $\Box$ Applicable $\boxtimes$ N/A (Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface water runoff and intercept and convey the runoff to a lined channel.)
1. Flow Bypass Bench          Location shown on site map        N/A or okay         Remarks:          Image: Note that the second secon
2. Bench Breached          Location shown on site map        N/A or okay         Remarks:          N/A or okay
3. Bench Overtopped          Location shown on site map        N/A or okay         Remarks:          Image: Second
C. Letdown Channels Applicable N/A (Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)
Remarks:       1. Settlement       Image: Location shown on site map       Image: No evidence of settlement         Areal extent       Depth       Image: Depth       Image: No evidence of settlement         Remarks:       Image: No evidence of settlement       Image: No evidence of settlement
2. Material Degradation       □ Location shown on site map       □ No evidence of degradation         Material typeAreal extent       Areal extent       □ No evidence of degradation         Remarks:       □ No evidence of degradation       □ No evidence of degradation
3. Erosion       □       Location shown on site map       □       No evidence of erosion         Areal extent       Depth       Remarks:       □       No evidence of erosion
4. Undercutting       □ Location shown on site map       □ No evidence of undercutting         Areal extent       Depth       Remarks:
5. Obstructions       □ Location shown on site map       □ No obstructions         TypeAreal extentSize       □ No obstructions         Remarks:       □ No obstructions

6. Excessive Vegetation Growth	<ul> <li>Location shown on site map</li> <li>No evidence of excessive growth</li> <li>Vegetation in channels does not obstruct flow</li> </ul>		
Type Areal extent Remarks:			
<b>D.</b> Cover Penetrations $\square$ Applicable $\boxtimes$ N/A	Δ		
1. Gas Vents       Active       Passive         Properly secured/locked       Evidence of leakage at penetration         Remarks:	<ul> <li>Functioning</li> <li>Needs maintenance</li> </ul>	<ul> <li>Routinely sampled</li> <li>Good condition</li> <li>N/A</li> </ul>	
2. Gas Monitoring Probes Properly secured/locked Evidence of leakage at penetration Remarks:	<ul> <li>Functioning</li> <li>Needs maintenance</li> </ul>	<ul> <li>Routinely sampled</li> <li>Good condition</li> <li>N/A</li> </ul>	
3. Monitoring Wells (within surface area of cover) Properly secured/locked Evidence of leakage at penetration Remarks: No monitoring wells associated with Site	☐ Functioning ☐ Needs maintenance 30.	<ul> <li>☐ Routinely sampled ☐ Good condition</li> <li>☑ N/A</li> </ul>	
4. Leachate Extraction Wells <ul> <li>Properly secured/locked</li> <li>Evidence of leakage at penetration</li> </ul> Remarks:	<ul><li>Functioning</li><li>Needs maintenance</li></ul>	<ul> <li>Routinely sampled</li> <li>Good condition</li> <li>N/A</li> </ul>	
5. Settlement Monuments Remarks:	Located	□ Routinely surveyed □ N/A	
E. Gas Collection and Treatment	Applicable	⊠ N/A	
1. Gas Treatment Facilities            ☐ Flaring         ☐ Good condition         ☐ Needs maintenance         Remarks:			
2. Gas Collection Wells, Manifolds, and Piping Good condition Needs main Remarks:	tenance		
3. Gas Monitoring Facilities (e.g., gas monitoring Good condition Needs main Remarks:	of adjacent homes or build tenance	ings)	
F. Cover Drainage Layer	⊠ N/A		
1. Outlet Pipes Inspected          Functioning        Remarks:	□ N/A		

2. <b>Outlet Rock Inspected</b> Remarks:	☐ Functioning	□ N/A
G. Detention/Sedimentation	on Ponds	e 🖾 N/A
1. Siltation Areal extent Remarks:	Depth	ıt □ N/A
2. Erosion Areal extent Remarks:	Depth	t □ N/A
3. Outlet Works Remarks:	☐ Functioning	□ N/A
4. <b>Dam</b> Remarks:	☐ Functioning	□ N/A
H. Retaining Walls Remarks:	🗌 Applicable 🛛 N	I/A
1. <b>Deformations</b> Horizontal displacement Rotational displacement Remarks:	Location s     Vertical displace	hown on site map Deformation not evident
2. <b>Degradation</b> Remarks:	Location s	hown on site map Degradation not evident
I. Perimeter Ditches/Off-S	ite Discharge 🗌 A	pplicable 🖾 N/A
1. Siltation Areal extent Remarks:	Location shown on Depth	site map 🔲 Siltation not evident
2. Vegetative Growth Areal extent Remarks:	☐ Location s ☐ Vegetation _ Type	hown on site map D/A n does not impede flow
3. Erosion Areal extent Remarks:	Location shown on Depth	site map   Erosion not evident
4. <b>Discharge Structure</b> Remarks:	Functionin	ng 🗌 N/A

VIII. VERTICAL BARRIER WALLS 🗌 Applicable 🛛 N/A			
1. Settlement          Location shown on site map           Settlement not evident			
Areal extent Depth			
Remarks:			
2. Performance Monitoring			
Type of monitoring			
Head differential			
Remarks:			
IX. GROUNDWATER/SURFACE WATER REMEDIES Applicable IN/A (Groundwater monitoring applicable to Site 21)			
A. Groundwater Extraction Wells, Pumps, and Pipelines			
1. Pumps, Wellhead Plumbing, and Electrical			
Good condition All required wells located Needs maintenance N/A  Remarks:			
2 Extraction System Pinelines, Valves, Valve Boxes, and Other Annurtenances			
Good condition Needs maintenance			
Remarks:			
3. Spare Parts and Equipment			
Remarks:			
B. Surface Water Collection Structures, Pumps, and Pipelines			
1. Collection Structures, Pumps, and Electrical			
□ Good condition □ Needs maintenance			
Remarks:			
2. Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances			
Good condition     Needs maintenance  Remarks:			
3. Spare Parts and Equipment			
☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided			
Kemarks:			

C. Treatment System
1. <b>Treatment Train</b> (Check components that apply)
☐ Metals removal ☐ Oil/water separation ☐ Bioremediation
☐ Air stripping ☐ Carbon adsorbers
Filters
Additive (e.g., chelation agent, flocculant)
□ Others:
Good condition
Sampling ports properly marked and functional
Sampling/maintenance log displayed and up to date
Equipment properly identified
Quantity of groundwater treated annually
Quantity of surface water treated annually
Remarks:
2. Electrical Enclosures and Panels (properly rated and functional)
□ N/A □ Good condition □ Needs maintenance
Remarks:
3. Tanks, Vaults, Storage Vessels
Bemerker
Remarks.
4. Discharge Structure and Appurtenances         Image: N/A       Image: Good condition         Remarks:
5. Treatment Building(s)         N/A       Good condition (esp. roof and doorways)         Chemicals and equipment properly stored         Remarks:
D. Monitoring Data
1. Monitoring Wells
<ul> <li>2. Monitoring Data         <ul> <li>☑ Is routinely submitted on time</li> <li>☑ Is of acceptable quality</li> </ul> </li> <li>Remarks:</li> </ul>

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3. <b>Monitoring Data Suggest:</b> ☐ Groundwater plume is effectively conta Remarks: Refer to Section 7 of the main report for 6	iined evaluation of groun	⊠ Contaminant concent dwater monitoring data.	rations are declining
E. Monitored Natural Attenuation			
1. Monitoring Wells          Image: Properly secured/locked       F         Image: All required wells located       N         Remarks:       Image: Properly secured/locked	unctioning leeds maintenance	☐ Routinely sampled ☐ N/A	Good condition
	X. OTHER RI	EMEDIES	
If there are remedies applied at the site which are no condition of any facility associated with the remedy.	ot covered above, at An example would	tach an inspection sheet deso l be soil vapor extraction.	cribing the physical nature and
Remarks: No other remedies.			
XI. OVERALL OBSERVATIONS			
A. Implementation of the Remedy			
Describe issues and observations relating to whethe what the remedy is to accomplish (i.e., to contain co	r the remedy is effe ntaminant plume, i	ctive and functioning as desi ninimize infiltration and gas	gned. Begin with a brief statement of emission, etc.)
Observations during the inspection indicate the remedies at Sites 21, 27 and 30 are effective and are functioning as designed.			
The remedy at Site 21 includes groundwater and soil gas monitoring to confirm risk from vapor intrusion remains within the acceptable range. The remedy also includes land use controls (LUCs) to prohibit groundwater use and restrict future commercial and residential use (require vapor intrusion controls).			
The remedy at Site 27 includes focused dredging, backfill with an armor layer and offsite disposal plus LUCs to protect the integrity of the armor layer and the surrounding sediment.			
The remedy at Site 30 includes LUCs to protect the	cover provided by t	he existing Building 502 four	ndation slab.

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#### B. Adequacy of O&M

Describe issues and observations relating to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long term protectiveness of the remedy.

Inspections at Sites 21 and 30 found all remedy components in good condition. Routine O&M activities will begin at Site 27 later in 2014.

### C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost of scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

No early indicators of potential problems were identified.

### **D.** Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

The network of monitoring wells at Site 21 provides sufficient data to assess the condition of groundwater and soil gas at the site. The network has been optimized to focus on areas with the highest historical concentrations of VOCs in groundwater and soil gas. No opportunities to further optimize the groundwater or soil gas monitoring plan for Site 21 were identified.

## SIGN IN SHEET

# SITE INSPECTION FOR FIRST FIVE-YEAR REVIEW AT NAVAL STATION TREASURE ISLAND, SAN FRANCISCO, CA

JUNE 19, 2014

570-541-3840	remacus. Sunga @ dtsc. ca. go/
510-622-5684	myriam-zech @ waterboards-cerg
h 510-302-6235	jessica, osullivan @tetratech.com
619-532-0796	danielle. janda @ navy.mil
415-308-1458	Keith. S. torman@navy.mil
303,312.8874	tim nove etetetch com
19 19	
	570-541-3840 510-622-5684 510-302-6235 619-632-0796 415-308-1458 303,312.8874

APPENDIX E PHOTOGRAPHIC LOG



All photographs taken on June 19, 2014. Photos are presented in the order taken.

Photograph 1. Site 27. Looking west, riprap in foreground.



Photograph 2. Site 27. Looking south across Clipper Cove at Yerba Buena Island.



Photograph 3. Site 27. Looking east.



Photograph 4. Site 21. Interior of Building 3 looking southeast. Portion of the building that is part of Site 21 is beyond the back corner in the distance.



Photograph 5. Site 21. Soil gas monitoring well 21-SG-27 inside Building 3.



Photograph 6. Site 21. Close-up view of soil gas monitoring well 21-SG-27.



Photograph 7. Site 21. Vicinity of soil gas monitoring well 21-SG-27, looking north from the well toward the interior of Building 3.



Photograph 8. Site 21. Vicinity of soil gas monitoring well 21-SG-27, looking south at the exterior wall of Building 3. Soil gas monitoring well 21-SG-27 label is in white paint near the center of the photograph.



Photograph 9. Site 21. Southeast corner of Building 3 in the general area of soil gas monitoring well 21-SG-31.



Photograph 10. Site 21. Interior of Building 3, looking west from the vehicle entrance on the east wall. Site 21 is located to the left and behind the camera, out of the photo.



Photograph 11. Site 21. Location of the former dip tank (below rusty overhang) outside the south wall of Building 3.



Photograph 12. Site 21. Groundwater monitoring well 21-MW02B. The well cover is in place, but two cover bolts were missing.



Photograph 13. Site 21. Soil gas monitoring well 21-SG-04 in good condition.



Photograph 14. Site 21. Looking southeast from groundwater monitoring well 21-MW-02B at stored sailboats and Treasure Island Sailing Center office trailer.



Photograph 15. Site 21. Treasure Island Sailing Center office trailer. Groundwater monitoring wells 21-MW09A and 21-MW09B are located just in front of the office trailer on the right.



Photograph 16. Site 21. Groundwater monitoring wells 21-MW09A and 21-MW09B and injection point 21-IP19 (lower left corner). All in good condition, except that one bolt is missing from the cover of well 21-MW09A.



Photograph 17. Site 21. Soil gas monitoring well 21-SG-05 in good condition.



Photograph 18. Site 33. Looking southwest from the northeast corner of a backfilled excavation. Building 107 is in the background; and another backfilled excavation is just to the right of the building.



Photograph 19. Site 33. Looking east down 4<sup>th</sup> Street at the southernmost backfilled excavation at Site 33.



Photograph 20. Site 31. Looking northwest at previously backfilled areas from the southern boundary of Site 31, just east of Avenue E.



Photograph 21. Site 31. Looking north at backfilled areas from the southern boundary of Site 31, just east of Avenue E  $11^{\text{th}}$  Street is in the fore/middle ground.



Photograph 22. Site 31. Looking northeast at backfilled areas from the southern boundary of Site 31. The intersection of Avenue E and 11<sup>th</sup> Street in the middle ground awaits repaying.



Photograph 23. Site 31. Looking north at backfilled areas from the northern boundary of Site 30.



Photograph 24. Site 30. Interior of Building 502 daycare center looking northwest from the entrance area.



Photograph 25. Site 30. Interior of Building 502 daycare center looking southeast toward the entrance area from the northwest corner.



Photograph 26. Site 30. Exterior asphalt-covered concrete pad located west of Building 502. Photo taken looking south from northern end of the pad. The pad is in good condition.



Photograph 27. Site 30. Exterior asphalt-covered concrete pad located west of Building 502. Photo taken looking north from southern end of the pad. The pad is in good condition.



Photograph 28. Site 30. Interior classroom at Building 502.